Urban Society and Technology

The City and Technology

It is important to include the problems of cities when examining the problems
of technology transfer and development. It has been the academic practice to
treat these three areas separately—though they are interrelated in complex
ways—following the tendency to reduce problems to the level of individual
disciplines. To remedy this, we have formulated the themes of "urban society
and technology" and "rural society and technology" in examining individual
sectors of industrial technology. Concentrating on these problems is perhaps
more relevant to development than whether we have obtained sufficient re-
sults to solve them directly.

The urban problem is today a global problem, encompassing both the
North and the South, but the problem differs in content and structure be-
tween the two areas. The South faces more complex and difficult problems in
employment, transportation, housing, health, social security, and similar
issues. The measures needed to solve these problems cannot be the same for
each country. In the context of development—exemplified by such problems
as the world's highest rents and land prices—Japan has solved these prob-
lems only partially; nevertheless, a few illustrations from the Japanese case
may be of interest in our dialogue.

The relation between the city and technology in the context of develop-
ment is our concern for the following, related reasons:
1. Technology and its transfer are essential for development.
2. Modern technologies, hard and soft, are mutually interrelated, each tend-
   ing to concentrate in places where related technologies and supporting
   services are available.
3. The city is where technology, service, and information are centred. In
   other words, where technology, service, and information have been cen-
   tred and accumulated is or will become a city.

Modern industry has developed and given rise to new cities. However, industrialization and modernization are defined, their processes are sure to generate urbanization, which is a prerequisite for industrialization and modernization that will, in turn, increase urbanization—as the Japanese experience demonstrates.

For example, such public services as transportation and electricity, essential for the modern city, will become available where a certain level of urban population has been reached. Developing countries have arrived at the stage of urbanization that constitutes a prerequisite for modernization and industrialization. Therefore, if priorities are set and wise technological choices and timely transfers of additional technology are continually made, these countries may anticipate success in their work to solve the problems they are likely to face.

Awareness of the particular phase of urbanization in which a country finds itself may be useful in making plans for that country. Urbanization has three phases:

1. Population expansion in existing cities.
2. Increase in the number of medium- and small-scale cities.
3. Development of the division of functions among cities and the nationwide formation of hierarchies to parallel the levels of these functions.

These phases correspond to the process of development, starting when the technology and the organizations for technology are first scattered, moving to when they are brought into some regional concentration, and finally to when they are integrated into a single entity.

In terms of this framework, many developing countries have completed the first phase, but not sufficiently the second and third phases. This means that the national network of technology in each does not yet cover the entire country and that the level of social integration is not high and the social structure is not as solid as it should be. Further, because of the rich diversity of local culture, the network for administration (national bureaucratization) does not function efficiently. This can, of course, prove both advantageous and disadvantageous to development.

In this context, by the middle of the nineteenth century, Japan had a network of more than 200 cities with populations ranging from 10,000 to 1 million. The functional hierarchy among cities had been completed by this time, and they were connected by all-weather roads and water-borne traffic. The Meiji Restoration included the reorganization of more than 240 small administrative units into 50 larger ones, and the new central government could recruit bureaucrats for administration not only from the ex-samurai class but also from other classes. This guaranteed it a cadre of leadership.

The Primate City

One characteristic of the process of development in today's non-Western world is that, while capitals have expanded to extraordinary sizes, the development of the secondary and tertiary cities has lagged far behind.

Tokyo is Japan's primate city. Its population at the time of our study was 11 million, only about 10 per cent of the total population of Japan. Within 30 kilometres of Tokyo is Yokohama City, which has a population of 3 million. The twenty-seven towns and cities in the Tokyo metropolitan district and the several neighbouring cities, such as Kawasaki City (more than 1 million population), boast extensive public transportation networks, bringing millions of commuters into the city each day. For this reason, the daytime population in central Tokyo exceeds 14 million people. The metropolitan area of the three large cities of Osaka, Kyoto, and Kobe, in western Japan, is less than 70 per cent as large as metropolitan Tokyo. But in the centres of both metropolitan areas, the night-time population decreases drastically, making them gigantic hollows. This differs markedly from what one finds in cities of the third world.

As the primate city, Tokyo constitutes a gigantic metropolitan area. It differs from large third-world urban centres because it sits atop a hierarchy of as many as 10 cities, each of which has more than 1 million population. Next on the list of cities in Japan are 10 with populations of 500,000 to 1 million and 38 with 300,000 to 500,000. It would be advantageous for the development policies of developing countries to promote the development of small and medium-sized cities.

However, while technology investment is influenced by related industries or supporting services, investment in the development of local cities faces its own set of limitations and urban investment tends toward the primate city. The renewal and redevelopment of facilities in the primate city, which, because of their scarcity, may have worn out through excessive use, is in competition with the development of local cities.

The formation of a primate city or excessive urbanization generated by population explosion and a low degree of industrialization have brought confusion to the cities. The phenomenon symbolizes the disorder of the entire national society at the initial stage of development. And although such confusion can lead to the dissolution of the national society, it should not be assumed that it does so automatically.

In the Japanese experience, excessive urbanization in pre-modern Japan occurred together with a population explosion. In the mid-nineteenth century, the political centre of Japan, Edo (present-day Tokyo), had a population of more than 1.1 million; the second largest community, Osaka, had 400,000; the third largest, Kyoto, had 300,000. Edo was indeed the primate city of Japan, and represented the country's political centre, with Kyoto the centre of sovereign authority and Osaka that of the economy, the three thus sharing the major functions.

The Meiji Restoration meant the unification of political power and sovereign authority in the new capital, Tokyo. The industrialization policy of the Meiji government brought about a new economic centre in the capital to compete with Osaka, but Tokyo could not easily dominate Osaka, and for a long time the two cities shared national economic hegemony. As industrialization progressed, however, Tokyo gradually established a predominance over Osaka.

The Inhabitants of Tokyo

The change from Edo to Tokyo signified a change in the political power and the polity. This change first brought about a decrease in population. Following the transition, the 1.1 million population peak of the Edo period fell to approximately 500,000. Some 20 years later, however, when the new government had become stabilized in the 1890s, the population again reached 1 million. Only 10 years later, it approached 2 million, more than 1 million of which represented an influx from outside.

The reason for this great influx was change in the villages. The land and taxation systems were reformed, freedom of occupational choice was guaranteed, and freedom of movement and residence was authorized. People were liberated almost overnight from the former feudalistic restraints. Many of the people moving in, however, were poor peasants who had been uprooted. Their poverty was a result of several things: major economic change, especially the inflation that had occurred following the opening of the country and the civil war; natural disasters that were induced or worsened by the administration's mismanagement in forestry conservation and riparian improvement; and the spread of contagious diseases.

Records kept by Europeans who visited Tokyo immediately after the Meiji Restoration indicate that people were extremely poor; many were half-naked and living in shanties. While most of the houses of former samurai were left empty, many people lived in shanties along the streets, the only place they could engage in peddling, to which they were restricted and for which no alternative job opportunities were provided. The shanty towns usually grew up within a range of 2 to 5 kilometres from the entertainment or business centres, areas located within the metropolis much the same as they are evolving today with populations of new inhabitants in cities of the third world.

In nineteenth-century Tokyo, the water-supply and drainage systems were not well established, and the water-supply network, which had been constructed in the Tokugawa period, fell to ruin when maintenance on it was discontinued. Underground water was abundant, however, and people could get water from shallow wells (Kosuge 1980). On the other hand, poor drainage facilities caused Tokyo to suffer repeatedly from water-borne diseases. The spread of cholera after ports were opened to foreign trade killed more than 100,000 people on each of several outbreaks that struck every several years until the beginning of this century, a period of more than 40 years. Under the unequal treaties forced on Japan by the Western powers, the government could not take preventive measures against epidemics because the diplomatic representatives of these powers opposed these measures. The most frequent victims were the lower-class city dwellers.

As the eighth governor of Tokyo (in office from 1883 to 1886), officially declared, "the roads, bridges, and rivers come first; the water-supply system, housing, and sewerage are secondary." The Meiji government gave priority to the modernization of industry and the military. Public welfare in the cities was of only secondary concern to the government, and Tokyo thus added

new urban problems induced by industrialization to the traditional ones it had inherited from the Edo period (Ishizuka 1979).

The Meiji élite believed that Westernizing the capital was essential in contributing to a revision of the unequal treaties with the Western powers. The new government office centre of stone buildings and the construction of brick buildings in the Ginza area were planned, moreover, to make Tokyo a city safe from fire. (Edo was the victim of major fires about every three years, and insufficient fire-prevention facilities had hindered the construction of full-scale wooden buildings.)

Although the more fire-resistant construction materials offered protection from fire, the change was not favourably accepted by the people because these materials did not fit the natural environment of high temperatures, high humidity, and frequent earthquakes. Consequently, the Ginza brick-town plan was never completed. In a rather meandering fashion, the Ginza of today was formed, and Tokyoites today little realize the fashionable Ginza was once a slum area.

In general, urban planning in Japan until the defeat in World War II consisted of industrial and transportation network development for national defence, leaving the housing problems in the hands of the private sector. Real-estate dealers operating rental houses reigned in the slum areas. Residents rented tenement houses partitioned like the mouth of a harmonica, and the rent was collected daily. They lived literally from hand to mouth. Rain prevented many people from working outdoors, often requiring them to pawn their little bit of furniture and working tools to buy sustenance. Near the slums were prosperous pawnshops and street stalls selling food made by re-cooking the remnants of meals from school dormitories and hospitals.

The Poor

Although most of the population in Tokyo was made up of impoverished newcomers, they were not a uniform group, but comprised three subcategories:

1. Low-Income Artisans

This group was represented by such outdoor construction-related workers as carpenters, plasterers, stonemasons, and gardeners, and by such skilled craftsmen as gold- and silversmiths, furniture makers, and tailors. These people retailed or peddled their own products. Owners of small shops with petty capital were included in this category.[18]

2. Paupers

This group included rickshaw men, representative of the new urban labour that had come about since the 1880s, daily labourers, and unskilled outdoor manual labourers. (The rickshaw men consisted of such types as self-employed, retained, renter-live-in, etc. The size and stability of income

varied according to the order in which they are listed here.) The rickshaw man's income was sometimes above the average income level of low-level urban workers; but the work was so hard they could seldom continue their work much beyond middle age.

3. The Destitute

This class consisted of persons engaged in light labour, such as street merchants, peddlers, street performers, beggars, rag-pickers, and vagabonds. Some characteristics of this class were that there were no age and sex distinctions by type of job, the jobs were ill-defined, and the workers often had no permanent residences. In other words, this group constituted the lowest stratum of urban society. The disabled, the old and infirm, and the physically handicapped who could not manage even light labour were included in this group.

Groups 2 and 3, and sometimes a portion of group 1, could be referred to as the odd-job stratum of the cities; but its constituents are much more varied than the so-called lumpen proletariat. This class may be considered similar to the populace often referred to today as the urban informal sector. In any case, though this group included criminals and slum dwellers, the class as a whole cannot appropriately be characterized as antisocial. Here we find a fundamental difference from the exclusive, closed, small social group classically seen in an industrial society. Applying to this group the terms "slum of hope" or "slum of despair," or both, does not contribute to a true understanding.[19]

Category 3, the destitute, clearly needed protection and relief. And yet, the Tokyo city government underestimated this population category, placing it at about 10 per cent of the whole (Nakagawa 1982). The authorities believed that welfare policies directed at this class would cause a new inflow of the same class into Tokyo, and because the whole society was in transition, this would lead to bankruptcy of the city budget and spoil the will of these people for self-help.

In the 1890s, members of what we are calling the odd-job stratum had an average income of four yen (about four US dollars), and needed 70 per cent of this income for food and 15 per cent for rent. These people, on the edge of starvation, were seen not only in the principal cities but also in medium-sized and small municipalities and in rural villages. Some were employed by a village or jointly by several villages to fill the most menial jobs.

Today, according to one report, nearly 40 per cent of the people in South Asian agricultural villages consists of a non-agricultural population, a class that corresponds to the odd-job stratum described above in reference to Japan. Because of the population explosion and the limited means to sustain a growing population in the villages, impoverished peasants flow into the cities and fill the odd jobs, a phenomenon that could be explained by the widely accepted push-pull theory.

As a corollary to this, Yokoyama Gennosuke stated in his book, *Nihon no kasō shakai* (The lower strata of Japanese society), that, once a popula-

tion has flowed into the cities, it very rarely returns to the villages whence it came.[20] Although Calcutta reported that in the 1960s some 200,000 people migrated from the city during harvest season and then returned when the season ended, this was a temporal outflow, a manifestation of a so-called floating population, a phenomenon which, assuming Yokoyama is correct, was for the most part non-existent in Japan at the time.

According to Yokoyama, Japanese cities at the end of the nineteenth century had the capacity to absorb the odd-job stratum, an ability comparable to contemporary third-world cities. A possible explanation for this might be that the initial stage of industrialization is accompanied by a population explosion, and the number and size of slums—not necessarily centred on the primate city—are proportionate to the size of the cities. An enlarged slum provides specialized minor jobs, and the demands for diversified goods and services support poor people and stabilize their livelihood at a low level.

Sojourners

At this time there were a great many adult male lodgers and temporary residents (sojourners) in Tokyo. In 1869, immediately after the Meiji Restoration, the adult male population of Tokyo (250,000) almost equaled the adult female population (260,000). Twenty years later, however, the male population had increased by more than 100,000—most of this represented by the sojourner class—though the total population of the city remained the same as in the Edo period. Most of these sojourners were to be found around the tradesmen's houses in the commercial and industrial areas and along the nearby alleys where the low-income artisans and paupers lived, and this was closely related to the odd-job nature of their work: the odd job that the sojourner relied on for his living could not be found elsewhere. Their employment opportunities were sharply limited, and, as a result of these circumstances, this group lacked the means to settle down and form families.

Not all of the sojourner population, however, was to be found in the low-income stratum. Many bureaucrats in the new government, who were high-income earners, had come to Tokyo in its early days, leaving their families in their home towns. Even when the families joined them, they did not give up their permanent domiciles. These bureaucrats provided support to relatives and others who did leave their home towns for Tokyo or, if not, help in securing employment. It was regarded as the social responsibility of those who were successful to provide for their home-town friends and relatives.

The relations thus formed on the basis of a common origin or through mutual reliance helped connect Tokyo and the local areas and sometimes contributed to the creation of strong factions. This was especially notable in the bureaucracy, particularly among high military officers who came from a limited number of clans. With the increase of population in specialized and skilled occupations, however, the principle of personnel selection based on academic background or general merit gradually became established. Nevertheless, all other qualifications being equal, in terms of reliability and ex-

pectations, priority in hiring was given to persons from the same province and the same universities, the academic cliques duplicating the cliques based on place of origin. Long-term investments for the development of education and human resources were influenced by the formation of these cliques.

Although support for or opposition to the new government had been based on one's provincial affiliations, the basis for deciding loyalty slowly moved from provincial loyalty to actual merit resulting from the acquisition and use of new technology. And the changing basis for evaluation was expanded from the political and military arena to foreign trade, the arts, and technology in the service of national development.

Formation of the New Middle Class

The great effect industrialization had on urban society was the dissolution of the pauper class. New occupations (such as florists and makers of footwear and bags) were created, and the living standard of skilled artisans was gradually improved and stabilized. The rickshaw men and outdoor labourers of the former pauper class established families, thus creating a new phase in urban society.

When urbanization entered this new phase in the 1900s, the persons who later were transformed into industrial workers were born into the urban lower classes. As subdivision in manufacturing progressed, through a system of subcontracting that resulted from a breakup in the production process, some skilled workers became owners of small factories or of part of the shop-floor production. As larger industrial networks formed, members of the urban lower classes moved to the areas surrounding the big factories, thus transforming towns into strongholds of factory workers and their families. At the initial stage, before this development, the factories themselves were located near the slums, on land that was cheap and where the recruitment of labour was easy (Ishizuka 1980). Cotton-spining factories were the most typical example.

Simultaneously, a new middle class was emerging, including low-level civil servants such as school teachers, public employees, railway workers, and low-ranking professional soldiers. The government provided them with housing and long-service pensions. Although their levels of income were not so different from those of skilled workers or owners of small shops, their social consciousness and life-style set them apart. For people in this class, even when the income of the head of the family was too small to support the family, the wife or other family members hesitated to work outside the home, and the deficit would thus be supplemented by part-time work done at home.

Above this class lay a thin upper-middle class: owners of big shops, academically trained professionals, independent business owners, managers in big enterprises, and high-ranking bureaucrats. An element that differentiated this higher middle class from the new middle class was that, besides

houseboys and maids, it had unmarried female domestic labour, called "housekeeping trainees" (with the housewife as the teacher).

This domestic labour force, especially the trainees, gradually disappeared after the establishment and spread of the school system. World War II made it impossible for households in this class to keep domestic servants, male or female.

The expansion of the old middle class and the formation of the new middle class provided people of the low-income artisan stratum (group 1) with a stable market for their products and services. A great many new occupations came about with the appearance of small-business owners. The odd-job stratum did not disappear as an entity, but reformed to produce a new supply of industrial workers. This and the new middle class, which formed and expanded in parallel, signaled a new phase of urban society brought about by industrialization.

Urban Life

Tokyo consists of two poles in terms of society and culture: Yamanote (the hilly, uptown part of the city) and Shitamachi (downtown), geographical references dating from the Edo period. As in the distinction between town and village, it is difficult to precisely distinguish the two. In Tokyo, 10 times bigger than Edo, the two are intermingled and multilayered.

However, some distinction can be made regarding differences in life-style, values, and especially in what might be termed social aesthetics. In general, Yamanote people are progressive, Western-oriented, individualistic, better-educated, professional or managerial types, and speakers of standard Japanese. The disposition of the residents of Shitamachi is contrary in all respects; they maintain the emotions and traditions of the common people of the Edo era: they are fond of traditional public entertainment; they are frank, amiable, religious, and cherish good relations with their neighbours; and they take pride in hard, honest work. They love to celebrate and have a bit of the rebel in them. The true-born Edoite represented the ideal type. It is a type reminiscent perhaps of the one corresponding to Évian-les-Bains in France or Ibn al-Balad in Cairo.[21]

The culture of the common people has been kept alive in the so-called town association. It is similar to Cairo's *harra* of the past or to the *mahalla* in other Muslim cities, but it differs in the following points. The Japanese town association is an autonomous neighbourhood organization for mutual assistance and friendship in which members are all heads of families in a specified block. It has as its subsidiaries organizations of young men and women, children, and old men and women, categorized by age and occasionally by sex. It used to carry out such functions as fire-fighting, crime prevention, and night-watch. In its function as the terminal unit of urban administration, it is a unique feature of the Japanese city (Nakamura 1979).

There are many theories regarding the origin, functions, and organization of the town association. Tokyo, for example, underwent the upheavals of the Meiji Restoration, the great Kanto Earthquake of 1923, the damages of World War II, and the post-war expansion. And accordingly, the town associations within Tokyo differ from area to area. Reflecting the diverse social characteristics of the inhabitants of the city's areas or blocks, the attitudes of people toward their neighbours and the manner and extent of their participation in the town associations also differ.

In particular, liberal intellectuals of the middle class still remember the dismal experiences in the years of the military fascist regime, when the town association was used for economic control and spying on neighbours. Some resent the present-day town association, seeing it as a vote-collecting machine to support the party in power.[22]

A Provincial City Case-Study: Traditional Technology in Kanazawa

The Tokyo metropolitan area forms the primate city, and, on the prefectural level, the seat of the prefectural capital is considered the regional primate. In Ishikawa Prefecture, for example, with a population of 1,110,000, Kanazawa City, the prefectural capital, has 410,000 residents, while the second largest community, Komatsu, has only 100,000, and the third largest less than 70,000 (as of 1984).

Kanazawa was the fifth largest city in Japan in the Edo period, after Edo, Osaka, Kyoto, and Nagoya. It now ranks thirtieth of 652 cities. Kanazawa has preserved the unique culture of an old castle town. Except for the Tokugawas, no other feudal lord had an income as large as the lord of Kanazawa, who was a member of the Maeda family. That the site of this lord's Edo residence is now the campus of Tokyo University gives an indication of the power he held.

The Maeda family developed Kanazawa into the largest centre of traditional arts and crafts after Kyoto. The climate in Kanazawa is the most suitable in Japan for the production of lacquer ware, in which the preliminary production process is woodworking. The technology of woodworking has a close relation with the technology for manufacturing metal tools and cutlery. The pinnacle of this technology was represented by the techniques of forging and heat treating to produce the blades of Japanese swords. Heat-treating technology was developed with the aid of high-quality charcoal. The local supply of good firewood and of high-quality charcoal was indispensable to the production of the internationally famous Kutani pottery and of metalwork. The technologies for Japanese paper, fish-nets, fine linen (*habutae*), silk fabrics (pongee), japanned works, and dyeing (*yuzen*) had also been developed, and their products were high-quality Kanazawa specialties that had markets throughout Japan. Other famous traditional fine arts of high value had

evolved as products of high-level technology, but they were made only in small quantities for limited markets.

Representative of these was damascene. Damascene refers to inlays of thin gold or silver lines into armour and arms. The secret of Kanazawa damascene was that, regardless of the design, the bottom of the inlay was wider than the surface, thus displaying practical characteristics in its resistance to shock and in its elasticity. Because of the high artistic and practical value of Kanazawa damascene, masters of goldsmithing (including gold-leaf artisans) were accorded the status of samurai.

There were 45 such masters on the eve of Meiji, and each had more than 10 craftsmen under him and an equal or greater number of apprentices. Including the craftsmen employed for intermediate processing, the people engaged in related sectors of technology and services, suppliers of raw materials, and the family members of all, the total number reached to several thousand. When other types of craftsmen and their supporting sectors are included, the total accounted for nearly half the total population of Kanazawa (which was less than 100,000). The political changes brought on by the Meiji Restoration, however, quickly deprived them of their steady customers and protection by the clan, causing widespread unemployment and poverty.

The new central government's general policy of promoting industry, however, also provided an opportunity to the people in Kanazawa. The new mayor, a former low-ranking samurai, made plans to industrialize the traditional arts and crafts. He campaigned among influential and wealthy citizens to initiate a copper-ware company. All of this represented a switch from government patronage to civilian needs, from inlaying on iron to inlaying on bronze and red copper, and thus a major conversion in materials and technology. It also meant a transformation of craftsmen into small entrepreneurs and skilled workers.

Kanazawa's participation at the request of the Japanese government in the international exhibition in Vienna in 1873 provided the necessary momentum that advanced such technological change (Tanaka 1980). Later, Kanazawa goldsmiths were given a boost of confidence after winning a prize at the First All-Japan Exhibition of 1877, held to promote greater awareness and exchange of regional technologies. This positive trend continued with the international exhibition in Paris of the following year.

In the mean time, the Ishikawa Prefectural Industrial Museum was established in 1876 through the efforts of pioneering local government officials, and vocational schools were opened with the object of enhancing and modernizing the traditional local craft industries.

Contrary to the practice of passing down in secret technology from the master to his apprentices within each workshop, the open technical training in the vocational schools contributed to forging new leaders in the local traditional crafts industry. As the technological level rose, the educational system became more refined. Thus were laid the foundations for the eventual establishment of Kanazawa Technical College and, after World War II, Kanazawa

University of Fine Arts and the Department of Engineering of Kanazawa University (Tanaka 1980; Koyano 1979).

Although the process of modernization and improvement of traditional technology appears at first to have evolved smoothly, it was, in fact, challenged by some major bottle-necks, ones that were affecting the entire nation. Among them were the Sino-Japanese War, the Russo-Japanese War, World War I, and—the most important—the rice riots of 1918.

Urbanization meant an increased demand for rice. The steep price rises caused by wartime inflation severely affected rice (the price more than tripled in two years), which was the staple food for people living in cities. The rice riots were ignited by a protest movement of fishermen's wives in a small port town on the Japan Sea coast. They attempted to prevent the locally harvested rice from being delivered to other prefectures. They attacked the rice retailers, forcing them to open their warehouses and sell their rice cheaply. The riots spread quickly throughout the country, not only to big cities but also to factory and mining towns and even to rural villages. The exploitation by landlords was so severe that 90 per cent of the peasants producing rice were too poor to supply themselves with rice. For three months in 60 cities, towns, and villages, there occurred the biggest riots since those during the Meiji Restoration, disturbances that could not be calmed without the use of military power.

Rapid industrialization had eradicated the built-in stabilizers of pre-modern society, while the functions for adjustment modern society should have provided had not yet matured. The rice riots were an eruption of class conflict caused by this situation.

Another form of the class problem, tenancy disputes, had spread throughout the country, and reached a peak in the 1910s. The disputes involved tenant farmers who were protesting against the conditions of extreme poverty and the lack of rights brought about by a rigidly structured, parasitic absentee landlord system. The protests eventually led the government to adopt legislative measures for the protection of tenancy rights.

It is noteworthy that the rice riots occurred at the stage of the formation of a national technology network. Those at the vanguard of the rice riots in Kanazawa were the craftsmen, especially the gold-beaters (Hashimoto 1980). During this time factory workers were not yet sufficiently organized as a group in Kanazawa, as the dual structure of the low-income artisan class and what we're calling the pauper class was still in existence there. It was perhaps natural, then, that the craftsmen were the main leaders of the protest campaign.

It is said that the rice rebellion in Kanazawa was well organized and highly disciplined. This is probably because the main body of the rioters comprised craftsmen of traditional arts and technology who were socially and culturally conservative and who adhered to a strict aesthetic code.

The radicalization of even such conservative craftsmen as these, who devoted their lives to their aesthetic pursuit, was the product of a structural change in society that was quite different from the Meiji Restoration. For

even though the craftsmen had successfully broken away from their small local market to secure a nation-wide market for their traditional technical arts, their standard of living was not thus raised, but in fact it began to drop as a result of the steep price increases.

Kanazawa, though ranked high among other cities when agricultural production was the mainstay, fell in position as the nation industrialized. This was because industry in Japan has tended to develop along the Pacific coast. However, with attention turned in recent years to regional development, Kanazawa—heretofore free of industrial pollution—now has a new and rich potential.