

The Embryonic Formation of a Mass Consumption Society, and Innovation, in Japan During the 1920s

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At the present time, Japanese-made consumer goods dominate the world's markets. As a result, while the state of the Japanese economy is being criticized in international society, on the other hand interest grows worldwide in the innovation that spurred Japan's dynamic economic development. Accordingly, the task of clarifying when the innovation that was linked to the budding formation of a mass consumer society in Japan began provides an attractive topic for studies in economic history.

In this essay I consider the continuity or discontinuity between changes in structures of consumption and innovative developments in Japan during the 1920s and present Japanese society and technological innovation. In particular, this essay takes an international comparative perspective and approaches the topic by analyzing:

- a) concentration of population in urban areas
- b) recession and drops in prices
- c) development of democracy and reform of existing systems
- d) overview of a nascent mass consumer society and its creation.

With regard to its relationship to the nascent formation of a mass consumer society, I have clearly stipulated the special characteristics of innovation during the 1920s while extracting patterns such as the production process at large firms and technological development based at "town factories" (*machikōjō*).

Key words: THE 1920S, MASS PRODUCTION, MASS CONSUMPTION, MASS COMMUNICATION, INNOVATION, INNOVATOR, ENTREPRENEURSHIP, URBANIZATION, MODERNIZATION, DEMOCRACY, MASS LEISURE, SMALL AND MEDIUM-SIZED BUSINESS, A DEPARTMENT STORE, THE MIDDLE CLASS, TECHNICAL TRAINING.

Synopsis

In order to appreciate fully the role of innovation in modern Japan, some examination of its development during the 1920s is needed. The following thesis examines the concurrent development of a mass consumer society and the innovative development of mass production techniques which occurred in Japan during the 1920s.

The development of a mass consumption society in Japan came about a cycle behind its development in Europe and the US. It is possible to chart its emergence through various indicators of societal change in the 1920s. The gravitation of population toward urban areas, increasing standards of living, the early development of democracy and the maturing of a national vocational and higher education school system are all important. By the mid to late 1920s a mass consumption society, which had existed in embryo at the beginning of the decade, was starting to flourish. The diffusion of popular media and cinema, and influences from the West, particularly in fashion, encouraged the growth of the mass consumption

society, along with increases in urban mass transit.

Japanese industry, previously characterized by manual production and lagging behind its competitors abroad in areas of technological expertise, responded. Systems of mass production were developed, led by small enterprises of no more than fifty employees. Companies such as Matsushita and Janome, well known around the world as contemporary Japanese success stories, began their life in this way, and spurred on the rapid innovation that was the feature of Japanese industrialization during the 1920s.

Introduction

Nowadays, many Japanese commodities, such as computers, automobiles, motorcycles, TVs, and cameras, inundate the world market. On the one hand, people from around the world admire Japan's manufacturing power, and see it as a great industrial nation. Yet on the other hand, they feel threatened by the large amounts of Japanese products that are imported into their countries like a torrential downpour.

Through innovation, Japan has become a highly industrialized society in the fifty-odd years since its defeat at the end of World War II, despite the many difficulties it had in imitating and improving upon Western technology. Increases in Japanese exports, coupled with rapid economic growth however, has created economic friction with the US and EC countries. The international community continues to denounce Japan's behavior, preoccupied with the role that innovation plays in driving the dynamic development of the Japanese economy, and Japan is now suffering from a new tension.

With this context in mind, and in order to cultivate a greater level of international understanding of Japanese innovation,¹ I will examine the changes in consumption and innovation which took place in the early twentieth century, which came to form the basis for the economic structure of modern Japan.

There are several reasons for mentioning innovation and the consumption structure in the early 1920s. Many currently internationally well-known Japanese firms, such as Toyota, National, Honda, and Seiko, developed rapidly in the 1920s and succeeded in building their foundations during this period.

Moreover, Japan's mass consumption society underwent embryonic formation during the 1920s, one cycle later than in England or the US. In considering the currently highly sophisticated nature of Japan's mass consumption society, we cannot ignore the remarkable changes in social life that occurred in the 1920s, accompanying mass production, mass consumption, and the concentration of population in the cities.

The pattern of continuity and discontinuity which exists between the change to a mass consumption society and the growth of innovation in 1920's Japan, and present-day society and innovation, is a central theme of the economic history, technological history, social

¹ In his *Theory of Economic Development*, J. Schumpeter first published that a new combination existed of the means of production, labor, and innovation. Five examples of this combination are: (1) the production of goods hitherto not known to customers, or of superior quality; (2) the introduction of new methods of production; (3) the exploitation of a new market; (4) the acquisition of new sources of supply of raw materials or semi-products; and (5) the realization of a new organization which could occur with the formation or collapse of monopolies. When I refer to innovation in this thesis, I refer to Schumpeter's theory.

history and modern history disciplines. However, it is regrettable that a full-scale study of the politics, economy, technology, culture and society of 1920's Japan, has only begun in recent years.

I have written about this subject in such publications as *Monopoly and Weapon Production* (Keisoshobo, 1972), *Taisho Culture* (Kodansha), and *Movement to Abolish Prostitutes* (Chuokoronsha, 1982). The development of innovation and changes in the consumption structure during the 1920s are not widely understood internationally. This is partly because of the poor accumulation of study about Japan in the 1920s. For this reason I have chosen this as the subject for my thesis to be published for the Japan Review.

I. THE BASIC CONDITION IN MASS CONSUMPTION SOCIETY

Business activity in almost all countries of Europe and America began to pick up in the 1920s, following the end of the post-war crisis and the end of inflation. Nevertheless, Japan in the 1920s weathered four major crises of confidence: the bank crises in 1921 and 1922, the disastrous earthquake in 1923, and the financial crisis in 1927. During these four crises of confidence, two short upturns in business took place in 1921 and 1924. Both rapidly slipped backed into a downturn, and a period of long, chronic depression followed. Thus, Japan in the 1920s, immediately after the golden years and prosperity of World War One, suffered great depression.

Nevertheless, a mass consumption society began to form in Japan from the 1920s, particularly in respect to Japanese social life. I will give a general view of the embryonic formation of the mass consumption society, focussing in particular upon its economic aspects.

(A) The Gravitation of Population Toward the Cities

By the beginning of the twentieth century, Great Britain was experiencing the gravitation of population toward the cities, signaling the formation of a mass consumption society. Professor Masao Tashiro explained this process in the following way: "According to the census of 1911, the population of 'farm areas' in England and Wales occupied only 21.9% and the rest of the population, 78.1%, concentrated in large or small cities."²

In Japan, the gravitation of the population toward the cities accelerated during the 1920s and 1930s. According to census, the population of the six largest cities in Japan changed drastically in the fifteen years from 1920 to 1935. In this period, the population of Tokyo changed from 2,173,000 to 5,876,000; that of Osaka from 1,768,000 to 2,990,000; that of Kobe from 609,000 to 912,000; that of Nagoya from 608,000 to 1,083,000; that of Kyoto from 591,000 to 1,081,000; and that of Yokohama from 423,000 to 704,000. In each case, the population of these large cities grew by between 1.5 and 2.7 times.³

The six large cities absorbed large amounts of manpower, including neighboring cities, towns, and villages. As a result these became metropolitan communities, forming city zones in concentrated circles. Nevertheless, in 1930, the population working in agriculture (13,955,000) accounted for 47% of the total laborforce across all industries. As this figure

2 On the formation of mass consumption society, I am much indebted to the article by Masao Tashiro, "The Formation of Mass Consumption and Its Foundations, in *A History of the 20th Century*, No. 18, Nihon Mail Order, 1974.

3 See the table in Ichiro Yano, *Japan in Figures: 100 Years*, Kokusaisho, 1981, p. 46.

demonstrates, the ratio of the population living in farming areas was not less than in the cities.

Table 1 compares the proportion of the population living in cities with the total national population of several countries. It should be noted, however, that the population of Tokyo in the 1930s grew to about 5,880,000, making it one of the largest cities in the world (the population of London was 7,250,000 according to the 1911 census).

Table 1: *The Ratios of the Populations of Large Cities Compared with Total National Populations.* (Per 1000 of total population)
Source: Osaka Mainichi Newspaper Company, *Mainichi Yearbook 1927*

England (except Ireland)	389
Germany	262
USA	259
Netherlands	242
France	153
Switzerland	150
Japan	146
Italy	132
Belgium	119

(B) The Development of Depression and the Fall in Prices

At the time of World War I, chemical and heavy industries grew in number, and there was rapid growth in male labor, with high wages. Within this context, the real wage showed an upward tendency in the 1920s. Moreover, prices rose temporarily because of the Great Kanto Earthquake disaster in September 1923, though both retail and wholesale prices fell afterwards. Though the depression continued during this period, wage earners in cities could raise their standard of living in accordance with the upwards movement of real wages, and the fall in prices.

According to the fourth life table, the mortality rate of those babies born in 1921 was 153 per 1000. In comparison, the fifth life table cites the mortality rate of babies born in 1930 as

being 132.1 per 1000. Further, according to the revised life table, the average weight of Japanese boys at seventeen in 1930, was 53 kilograms, 1.2 kilograms more than that of boys of the same age in 1920.⁴

Based on the mortality rate of babies and the changes in weight, it is evident that the standard of consumption had risen to a certain degree in the 1920s. Farm life, depending on the backwardness of agriculture and the feudal system of production, also changed, little by little from the 1920s to the 1930s.

With the price of rice falling heavily from July 1925 however, the standard of living of the agrarian population worsened considerably, particularly in the Tohoku district where cold weather led to crop failure. Nevertheless, even in villages where the standard of living was quite low, these "villages acquired a share of the general wealth", and as a result "the standard of living in the 1930s had risen much higher than in the time before the Sino-Japanese War and the Russo-Japanese War".⁵

(C) The Development of Democracy and the Revolution of Institutions

At the time of the general election, and in accordance with the General Election Law of February 1928, the number of those people holding voting rights had grown to 12,409,078, about four times more than the number under the earlier, limited election law. As a result, political rights were opened up to the working class for the first time. Voting rights for women and their eligibility for election were not allowed though.

In the 1920s, the Labor Union Act bill was discussed in all but the 47th and 48th National Diets (*Teikoku Gikai*), though was never legislated. As the Labor Union Act was not legislated, managers' groups and the police in the 1920s tended to regard labor unions as unfair and at times, illegal, organizations. Strikes in those days were regarded as crimes.

In spite of this unreasonable political regulation, the working class during the 1920s acquired a certain political and economic status, which added to the great progress made in pulling up the standard of education and culture, and the institutions of social security.

The most extraordinary organ for consultations on education was instituted in 1917 and met under the control of the Terauchi Cabinet. It investigated various types and levels of education, among them elementary and high school education, university and special education, teaching education, women's education, industrial and supplementary education, social education, and the academic degree system. In May 1919, it accomplished its aim and was dismissed.

This meeting, which set the tone for the foundation of the education system in the 1920s, was a positive reaction to the remarkable increase in enthusiasm for school in those days. As a result, the burden for elementary school teachers' salaries assumed by local cities, towns, and villages, was reduced, and private and public universities and colleges were recognized. Moreover, the institution of girls' high schools and special schools was encouraged.

As industrial supplementary education was changed, the standards for school years and school hours of professional education were determined for those who would graduate from

4 For data on the mortality rate of babies, see the table in Total Development Organization, ed., *Historical Transition of Living Standards*, Total Development Organization, 1985, p. 68; and on weight, in *ibid.*, pp. 304-5.

5 Tsuguo Kawada, "Income and Living Standards of the Farm Population in Japan", in *Journal of the Osaka University of Commerce*, No. 4, December 1936, p. 13.

elementary school and find employment. Furthermore, advanced courses at industrial supplementary schools were recognized.

Based on the meetings on education, the fourth section to take charge of education within the Ministry of Education was instituted in May 1919. It changed its name to the Section for Social Education in 1924, and in 1929 became the Department of Social Education.

Influenced by the growth in democratic ideology, the elevation in the standard of living, and the reform of the education system, the number of students in elementary, junior high and high schools, and at universities, grew rapidly. In elementary schools, the number of children grew by 750,266 (from 8,031,695 in 1926 to 8,781,961 in 1930).⁶ The number of students in private and public junior high schools in 1913 was 131,242, and in private and public girls' high schools at the same time, 82,474. In 1922, the former became 225,634, and the latter, 210,316. As these figures show, both numbers grew rapidly, though the increase in the number of girls enrolled in secondary schools in the 1920s was remarkable.⁷

In 1918, the total number of high school students was 6,520, and there were 9,000 enrolled at the four Imperial universities. But in 1922, after only four years, the former was 11,921 (about 1.8 times higher), and the latter 35,163 (3.9 times higher).⁸ These figures demonstrate that higher educational institutions were greatly extended in the 1920s, and that many new universities and high schools were established in the same period. The extension of higher educational institutions was an epoch-making enterprise in Japanese educational history. Especially worthy of mention is that for the first time private universities were given the same position as imperial universities, and that they grew in number.

From the above it is clear that the working class increased their political, economic and social status during the 1920s period. But the workers and farmers, who formed a majority of the population, were unable to escape a condition of living in which Engel's coefficient was high. According to the statistics, Engel's coefficient for the city working family was 35.8%.⁹ From 1924 to 1927, the ratio of eating and drinking costs to household expenses, for workers in daily employment and for inhabitants of the slum quarters of Tokyo, reached 52% and 55.9%.¹⁰

In 1918, public markets, pawnshops, workers' lodgings, quick lunch rooms, public bathrooms, barbers, employment agencies, and public day-nurseries began to appear in large cities such as Tokyo and Osaka. Their appearance was influenced by the low living standard of the working class, symbolized by the rice riot (*Komesodo*) of 1918 and the first international working class meeting.

A social section was instituted in order to promote social services in twenty *Do* and prefectures, such as Tokyo-fu, Osaka-fu, Hokkaido, and others. Cities that took advantage of the opportunity of the social sections were Osaka city in 1918, and in the five other large cities of Tokyo, Yokohama, Nagoya, Kobe, and Kyoto, where social sections were newly

6 Shunsaku Kawahara, "Education, Art, and Science", in Keimeikai, eds., *Twenty Years of Contemporary Culture*, Keimeikai, 1937.

7 See the table in Yutaro Yamauchi, "Secondary Education in Japan", in Gunpei Miyashita, ed., *A Study of the State of Japan in 1923*, Nishodo Shoten, 1923, p. 73.

8 See the table in Mainichi Shinbun, *Mainichi Yearbook 1927*, p. 643, and Shunsaku Kawahara, op. cit.

9 See the table in *Japan in Figures*, pp. 436-7.

10 See Kiyoshi Nakagawa, *The Lower Strata of City Life in Japan*, Keisoshobo, 1985, pp. 205-7.

instituted.

The Health Insurance Act was established in 1922 and came into force in 1926. Insurance by the act however, paid only in cases of “sickness, injury, death or childbirth”. The Act only applied to those who worked at enterprises applicable to the Factory Management Act and Mines Act, and these workers numbered only about 2 million people, including private and public workers.

As mentioned above, the fundamental conditions for a mass consumption society meant that a mass society should develop gradually. In Japan it developed in only the ten or so years from the end of World War I to the 1920s. However, if we compare the formation of a mass society in Europe and the US with that of Japan we can note many quantitative and qualitative differences. For example, there was no universal suffrage as women were still not allowed to hold voting rights; the Trade Union Act was not instituted; the income level of the working class remained low; and the social security system was not yet fully completed.

II. THE EMBRYONIC FORMATION OF A MASS CONSUMPTION SOCIETY

Evolving urbanization formed both the greater Tokyo and greater Osaka districts, including suburbs as well as the city proper. It was the development of municipal transport systems such as streetcars, the National Railway city loops, suburban railways, buses and the subway, which promoted the extension of Tokyo and Osaka.

Around 819 million trips were made using the Tokyo transport system in 1924. Of these, 59.5% used the streetcar, 23.1% the *kokuden*, 12.9% the private line, and 4.5% the *noraijidasha*.

A National Railway city loop running through Tokyo was completed in 1925, and traffic service every five minutes was established. In 1927 the first subway opened between Ueno and Asakusa in Tokyo. In the same year, the Odakyu Electric Railway Company opened a suburban railway between Shinjuku in Tokyo and Odawara in Kanagawa prefecture, a distance of 82 kilometers. There were twelve suburban railway companies in 1927. With the development of suburban railways, people in Tokyo moved to the suburbs beginning in 1923,

Table 2: *Statistics Table of Companies.*

Source: The table of the Cabinet Statistics Bureau “An Outline of Statistics of Imperial Japan” 1930, pp. 47-8.

	TOTAL	Agriculture	Commerce	Industry	Mining	Traffic	Marine Product Industry
1920	29,917	787	14,530	11,829	457	2,055	259
1923	32,089	666	15,646	12,851	350	2,349	227
1927	38,516	758	19,586	14,382	363	3,181	246

the year of the Great Kanto Earthquake.

Table 2 shows that the number of companies grew from 29,917 in 1920 to 38,516 in 1927, and manufacturing and commerce developed especially rapidly in the same period.

The most typical sign of a mass consumption society is the development of commerce and the department store. In the 1920s, those department stores that were representative of Japan such as Mitsukoshi, Matsuya, Takashimaya, Sogo, Daimaru, Isetan and others modernized, introducing systems that were in place in Europe and the US.

During this period, these department stores transformed their image from that of high-ranking stores selling a fashionable lifestyle, into stores for the masses. The popularization of the department store brought about a change in the purchasing patterns of people in the large cities. People learned about purchasing with cash, introducing a new pattern of consumption. At Mitsukoshi and Daimaru in Osaka in 1926, shoppers could enter with their shoes on. This improvement meant that department stores became an extension of shopping streets, and their popularity accelerated further. This new improvement first found in Osaka department stores, spread rapidly throughout the country.

With the rise of elementary, secondary and high school education, literacy made rapid progress in the 1920s. As literacy progressed, the number of readers increased, and daily newspapers throughout the country, weekly and monthly magazines, and public relations, became major enterprises. They were all mediums that combined mass production with mass consumption.

The circulation of newspapers in 1927 reached about 4,700,000. The circulation of the Osaka Asahi newspaper alone was about 1,260,000 that year.¹¹ It was about 6.8 times more than that of the internationally known London Times, which circulated about 185,000 in 1928. Furthermore, the Osaka Asahi newspaper appended an annex of photographs, 'Asahi graphic', in its edition of January, 1, 1922. It was the first time that photographs had appeared in a newspaper in Japan, and was made possible by the perfection of a rotary press machine for photographs by Shugoro Tsujimoto in 1921.

The 1920s were the first time that an offset press machine (perfected in 1916) and a picture-typesetting machine (perfected in 1924) were produced domestically. With the rapid progresses of these new advances in press technology, attractive commercial posters, advertisements, magazines for women and children, and colorful movie and theatre magazines, were published on a mass level.

In 1922, the two great newspaper companies, Asahi and Mainichi, put out the 'Weekly Asahi' and the 'Sunday Mainichi' respectively. The initial number of 'Weekly Asahi' newspapers published was about 350,000. The fact that Japan's two biggest representative newspaper companies published weekly magazines corresponds with the extraordinary growth in city white-collar workers who worked on a weekly basis.

The first issue of the popular magazine *King*, published by Kodansha, sold out all 740,000 copies in no time. Then, the population of inland Japan was about 60 million, and based on the circulation figures for *King*, this meant that a little over one per 100 people read this magazine, an astounding figure.

11 See the table in Taketoshi Yamamoto, "Newspaper Reading Levels in Modern Japan", in Taketoshi Yamamoto, ed., *Newspaper Reader Levels in Modern Japan*, Hosei University, 1981, p. 412.

As the living standard improved little by little through the 1920s, the range of commodities from which consumers could select widened. With the change in consumer mentality, the possibilities for commercial advertising grew.

Advertising became a central feature of the mass consumption society from the 1920s. Industries that appealed to peoples' sense of choice rather than needs, such as for magazines, cosmetics, drinks and cakes, made use of various advertising media. Their wares were advertised extensively in, among other media, newspapers, posters, streetcars, and match covers. Medicine, books and cosmetics were called the three great advertising commodities in the 1920s, and the advertisements for these products by firms were remarkable in number. In the Osaka Asahi newspaper, the proportions of each of these products' advertisements were as follows: medicine, 20.8%; publications, 17.2%; and cosmetics, 14.8%¹².

The demand for cosmetics, beer, foreign wine and other products grew more and more in the 1920s. The trend toward greater advertising in these product areas not only reflected a new consumer demand, but also indicated the fluidity of the mass consumption society.

In 1925, Tokyo Broadcasting began its first regular broadcast. In 1929 a junction circuit of 1860 kilometers from Sendai to Kumamoto was completed, and a national relay broadcast became possible. With the establishment of a national broadcast network, the number of radio subscribers reached over 500,000 by the end of September 1928. The popularization of radio broadcasts accelerated still further the formation of a mass consumption society.

Working hours in Japanese factories during the 1920s was generally about ten hours a day. Table 3 shows the results of a labor survey conducted on October 10, 1924. According to this survey, of the 7,130 factories investigated, approximately 48% were working 'within ten',

Table 3: Working Hours, October 1924.

Source: op cit. "An Outline of Statistics of Imperial Japan", 1930, p. 98.

TOTAL NUMBER		Within 8 Hours		Within 10 Hours	
Factories	Workers	Factories	Workers	Factories	Workers
7,130	1,326,289	548	106,872	3,454	622,922

Within 12 Hours		Within 14 Hours		Irregular Hours	
Factories	Workers	Factories	Workers	Factories	Workers
3,069	548,285	57	12,110	2	100

¹² See the table in Sancho Tsuganezawa and Taketoshi Yamamoto, eds., *Newspaper Advertising and Management in Modern Japan*, Asahi Newspaper Publishing Company, 1979, p. 395.

43% 'within twelve', and 8% 'within eight'.

At the International Labor Conference held in October 1919, the principle of an eight-hour working day was decided. On this basis, eight-hour working days and 48-hour working weeks became a common principle among developed countries. Nevertheless, factories in Japan that adopted the eight-hour working day were mainly limited to large firms such as those involved in shipbuilding and machining.

The decrease in working hours in Japan in the 1920s was not as advanced as the reductions to occur in Europe and the US, the leisure hours of the working class remaining much more restricted. Nevertheless, during this period, as a result of economic growth, a great number of mass consumers appeared for the first time, and the claim for mass leisure, aimed at consumers, increased. The increase in the number of cinemas and theatres; the popularization of reading standard publications; the rapid diffusion of radio; popularization of sightseeing tours; usage of suburban trains, streetcars and buses; the popularization of sports such as baseball, tennis and swimming; and the growth in restaurants, bars and cafeterias, all attest to this fact. In these various domains, the trend toward mass leisure was remarkable.

One characteristic of mass leisure in this period was the success that movies had in attracting large numbers of viewers. According to an investigation conducted by the Ministry of Home Affairs in December 1925, there were about 700 cinemas catering to around 528,000 spectators a day in this period. These figures are in fact conservative, and it would be more accurate to estimate about 700,000 viewers per day on average.¹³

Thus, in the later half of the 1920s, consumer demand for standardized commodities increased. However, much of the production of consumer goods was limited to the area of minor enterprises.

In the US during this period, the production of highly standardized goods was fixed in the domain of consumer goods production like cars, canning, ready-made clothes, and so on. Keeping pace with this, an internal market based on the large population and high income of Americans formed there, with a vast number of consumer goods. In the period between the end of World War I and the 1920s, the formation of a mass consumption society in the US surpassed that of England, and came to occupy the first place in the world.

Compared with that of the US, the formation of a mass consumption society in Japan was much more delayed. For this reason, I have used the term 'in embryo' when referring to the formation of a mass consumption society in Japan.¹⁴

III. THE DEVELOPMENT OF INNOVATION IN JAPAN IN THE 1920S

Taking advantage of the beginning of World War I in 1914, the Japanese economy developed rapidly. Between World War I and the 1920s, Japan recorded the highest rate of economic growth in the world, as shown in table 4. In general, this rapid growth was due to the extension of export markets made possible by the war, and the subsequent development of internal markets. However, the factors accelerating economic growth in this period were not only the result of external circumstances. The stoppage of imports brought about by the war

13 *Mainichi Yearbook 1927*, p. 648.

14 For an outline of the formation of mass consumption society in Japan in the 1920s, see Tamio Takemura, *Taisho Culture*, Kodansha, 1984.

Table 4: *The Real Rates of Economic Growth Among Leading Countries.*
Source: Japan Bank, *Economic Statistics of Japan Since the Meiji Period* (growth rate calculated at compound interest).

JAPAN		USA		ENGLAND		ITALY		GERMANY	FRANCE		CANADA	
Period	%	Period	%	Period	%	Period	%		Period	%	Period	%
1915-19	4.07	1914-23	2.36			1901-13		1 2.73			1914-18	3.86
1905-09		1904-13				1891-1900					1904-08	
1920-24	8.71	1919-28	3.35			1906-15	2.56		1920-28	3. 2.69	1919-23	1.45
1910-14		1909-18				1896-1905			1901-10		1909-13	
1925-29	5.20	1924-33	2.69			1915	2.18				1924-28	2.19
1915-19		1914-23				1896-1905					1914-18	
1930-34	5.97	1929-38	0.43		2.40	1921-1939	2.29		1929-38	3. 1.58	1929-33	1.75
1920-24		1919-28				1921-29			1920-28		1919-23	
1935-39	5.10	1934-43	1.24			1934-38		2. 10.48	1934-43	3. -2.08	1934-38	0.68
1925-29		1924-33				1928			1924-33		1926	

1. Territory as at 1913.
2. Territory as at 1925.
3. Including Alsace and Lorraine.

gave the Japanese economy a chance to become 'independent', releasing the energy of industrialization that had been accumulating since the latter half of the 19th century.

Information from Europe and the US, together with the importation of chemical dye materials, medicine, mechanics and other material, ceased with the beginning of World War One. Japan was forced to supply these industrial goods by itself, as well as undertake its own research for industrialization. As a result, the Institute of Physical and Chemical Research was founded in 1917, and the Institute of Metal, affiliated with Tohoku University, was established in 1919. Four other significant research institutes to emerge in this period were: the Osaka Industrial Experiment Station, founded in 1918; Tokyo Imperial University's aviation laboratory, also founded in 1918; the Ministry of Commerce and Industry's fuel laboratory from 1920; and the Ministry of Domestic Affairs' civil engineering laboratory, established in 1921. A common characteristic of all national research institutes was their emphasis upon the development of new technology. Private enterprises such as Mitsui Mining, Mitsubishi Shipbuilding, Mitsubishi Papermaking, Tokyo Electric, Mitsuwa, Kanebo, and Nisshin Flour Milling all founded research institutes.

The experience of World War I left the allies admiring the strength of Germany's wartime industrial mobilization system. One of the most fundamental aspects of this system was the industrial education provided to factory managers, foremen, and the skilled workers who led production. After the war, Japan set about promoting industrial education, heavily influenced by the German experience. Taking advantage of the education meeting previously mentioned, a policy of increasing the number of national industrial high schools was decided upon. As a result, four technological high schools, such as the two in Tokyo and Kanazawa, and six industrial high schools, three of which were in Fukui, Kobe and Nagaoka, were established between 1920 and 1924.

In 1929, the Tokyo and Osaka industrial high schools were raised to the status of industrial colleges. By establishing high-level institutes for industrial education in machinery, electronics and applied chemistry to name just three fields, a pool of skilled engineers was assured that could form a nucleus of production, providing technical guidance and production management. However, one aspect of German high level industrial education, the perfection of education for workmen, was adopted in Japanese circles, though in an extremely inefficient manner.¹⁵

From the period of the war to the 1920s, heavy and chemical industrialization in Japan developed under the direction of the so-called *Zaibatsu* such as Mitsui, Mitsubishi, and Sumitomo. After the war, Mitsui used the stoppage in imports of dyestuffs as an opportunity to set-up a dyestuffs industry, founding Toyo Rayon. Mitsubishi established the previously mentioned research institutes, and advanced into steel and airplane production industries, also developing a welding and large-sized diesel engine for the shipbuilding industry. Asahi Glass, a system of Mitsubishi, began production of ammonia soda on an experimental basis. Sumitomo undertook the manufacturing and processing of duralumin under the direction of the Navy, and industrialized KS steel, started by Kotaro Honda.

15 Nihon Steel Mill abolished the training facility in 1927. Sumitomo Steel Mill abolished the apprenticeship scheme for workmen in the same year, too. The training facility for young workmen at Yahata Steel Mill stopped recruiting apprentices in 1923. See Yutaka Nishinarita, "The Organization of Labor Force and Industrial Relations", in Research Committee on the History of the 1920s, eds., *Capitalism in Japan in the 1920s*, Tokyo University, 1983, p. 187.

Despite these examples, the degree of innovation made by the three great companies above was tepid because the *Zaibatsu* were in need of a high level of innovation though were reluctant to branch into new domains where market prospects were unstable. In fact, it was the capitals, and above all the minor capitals, rather than the three great *Zaibatsu*, which attained a high level of manufacturing during this period and which contributed to the 'independence' of the Japanese economy.

Suzuki, a large firm under the Furukawa system, and Fujitagumi, embarked on technical development in new domains such as chemistry, in a much more active fashion than the three great *Zaibatsu*. The enterprise of Naokichi Kaneko of Suzuki is an example of this type of technical development.

Naokichi Kaneko founded the Imperial Artificial Silk Thread Corporation, which strongly supported the research of Itsuzo Hata and Kiyota Kumura. Moreover, the Suzuki enterprise, in connection with Taiwan Bank, founded the Kobe Steel Corporation, Harima Shipbuilding, Dainihon Salt Corporation, International Ship Corporation, the Claud Process Nitrogen Industry Corporation, Godo Oils and Fats, Honen Oil Manufacturing Company, Nihon Camphor, Taiyo Soda, and Korean Paper Making, among other companies.¹⁶

In the period between the war and the 1920s, and consistent with the embryonic formation of a mass consumption society, minor enterprises of between five and fifty workers engaged in the production of consumer goods, were able to compete with larger enterprises as a result

Table 5: *The Number of Factories (by Employees).*

Source: Tsuneta Yano Anniversary Committee (ed.), *100 Years of Japan Seen With Figures*, Kokuseisha, 1986, p. 219.

	5-49	50-99	100-499	500-999	Over 1000	TOTAL
1909	29,565	1,431	909	81	57	32,032
1914	28,322	1,786	1,141	124	85	31,458
1920	41,073	2,413	1,717	221	162	45,576
1925	43,850	2,620	1,963	284	233	48,850
1930	56,363	2,826	2,166	270	143	61,768
1935	77,613	3,743	2,689	355	225	84,625
1940	127,876	4,767	3,599	506	394	137,142

16 See the following theses about the development of innovation in the so-called second rate *Zaibatsu* and non-*Zaibatsu* enterprises from WWI to the 1920s: "The Character of Capital and Taisho Democracy", in Tamio Takemura, *Monopoly and Weapon Production*, Keisoshobo, 1971. Tamio Takemura, "Technology and the Change of Daily Life for the Consumer", in Hoshimi Uchida, ed., *A Social History of Technology*, Vol. 5, Yuhikaku, 1983.

of technological progress. There were three characteristics of this development as it appeared in the consumer goods production industry.

Firstly, among Japanese industries "where mass production was relatively favorable, we can note base metal, heavy industry, gas, electric, silk thread, artificial silk thread, flour milling, sugar, cement, beer, glass, dyestuffs, chemical fertilizer, etc. On the other hand, almost all kinds of textiles, wooden products, straw products, celluloid, *setomono* (porcelain pottery), rubber, and other consumer goods were being produced in minor or medium factories crowding the cities or studded in the country".¹⁷

Table 5 shows that at the end of 1925 the minor factories which employed not less than five and no more than fifty workers, occupied about 90% of all factories. These minor factories employed over one third of all workers and produced about 30% of industrial products in 1930, as shown in table 6.

Secondly, with the outbreak of World War I and the opportunities that Japan seized upon to industrialize as a result, many articles, which hitherto had not been manufactured, began to make use of the motors that accompanied the 'industrial revolution'. This trend accelerated with the diffusion of electric power and the rise in wages during the period of the European war and after.¹⁸

The number of factories that had installed electric machines rose dramatically in the 1920s. From 1923 to 1927 the number of electric motor installations grew by about 1.7 times.

Table 6: *The Number of the Industrial Employees by Factory's Scale.* (per unit of 1000).

Source: Tsuneta Yano Anniversary Committee (ed.), *100 Years of Japan Seen With Figures*, p. 220.

	5-49	50-99	100-499	500-999	Over 1000	TOTAL
1909	375	101	175	58	112	821
1914	404	126	226	85	168	1,009
1920	617	194	377	187	382	1,758
1925	620	191	436	215	535	1,996
1930	694	216	485	210	269	1,875
1935	969	283	583	269	515	2,620
1940	1,636	381	847	411	1,211	4,486

17 W. W. Rockwood, *The Economic Development of Japan*, Toyo Keizai Shinposha, 1950.

18 Kanekichi Takahashi, *The History of Industrial Development in the Meiji and Taisho Periods*, Kaizosha, 1929, p. 424.

Moreover, related to the electrification of daily life, the demand for electric lights in the home increased remarkably. The number of homes demanding electric lights reached 10,547,235 in 1927. There were 10,460,440 homes on the inland in 1918.

From around 1923, the demand for electric heaters increased rapidly in Osaka and Kyoto. A pamphlet put out for its employees by Mitsukoshi, the largest department store in Tokyo, provided information about various home commodities such as an electric portable clay cooking stove, an electric water heater, an electric baker, and an electric stove, demonstrating that these home electric appliances were being used in some households at this time.¹⁹

Thirdly, during this period, in response to the evolution of factories with installed electric motors, many minor factories that produced consumer goods moved from the domestic systems of production to that of machinery manufacturing. Innovation by minor enterprises producing consumer goods can be considered in terms of three types.

The first type involved the shift from domestic systems to mass production by small-scale factories of between five and fifty employees. As these factories, known as *machikoba* (a small factory in town) lacked capital and were at very low levels of technology, innovation took the form of improving existing commodities first.

The second type was innovation by minor enterprises in consumer goods producing industries, which required a particular technological advance in the process of commodity development. Minor enterprises that aimed to develop and mass-produce new consumer goods found it difficult to manufacture the goods so that they could compete with foreign goods, largely because of the low technological level of Japan's machine tool industry.

The third type was innovation by minor enterprises that used technology introduced from Europe and the US, and which came to form the foundation for mass production. Many of the enterprises that fit this description succeeded in securing markets for mass produced goods, owing to particular technology that the large enterprises could not imitate. In the following discussion, typical minor enterprises that belong to the above three categories will be considered, along with the characteristics of innovation.

Matsushita Electric Device Manufacturing is a typical enterprise of the first type. Konosuke Matsushita founded the firm in 1918, and in the seventy years since, it has become one of the firms most associated with electronics manufacturing. It received international fame as 'National of the world'.

After K. Matsushita retired from Osaka Electric Light Company in 1916, he began to produce sockets in Osaka. There were only two small pressers in his factory, and he employed only three people: himself, his wife, and his wife's brother. An attaching plug developed and produced by Matsushita at the time of the company's foundation was popular on the market, and in only six months products were being shipped from Osaka to the Tokyo district. The *machikoba* of Matsushita increased its employees to twenty in order to fulfill the orders.

Why did the sale of Matsushita products increase so rapidly? During this period, the walls of poor wooden houses in Japan were made of earth. Consequently, it was impossible to install inner electric wiring, which was then being done in Europe and the US. Because of characteristics peculiar to Japanese homes, an attaching plug was needed for people to use

19 "A Study on Commodities", Merchandise Division in Mitsukoshi's Drapery Shop, 1923, Vol. 4, No. 2, pp. 28-34.

electricity directly from the wires. Matsushita's plugs were not only a new design, they were also 30% cheaper than the market price at the time, and as such ideal for home usage.

In 1923 Matsushita developed and sold an electric cell lamp for bicycles. The lamp, of a cannonball type, could be used successively for forty or fifty hours. As the market's other electric cell lamp could only be used for two or three hours, the Matsushita lamp sold throughout the country through retail stores.

The popularity of the bicycle in Japan increased dramatically in the 1920s. There were 162,433 bicycles in Tokyo city in April 1925. This compares to only 5,179 automobiles, including both loading and passenger vehicles.²⁰ Bicycles were particularly popular in large cities, and most owners were concerned with being able to ride safely at night. Matsushita was able to sell the small electric cell lamp for the bicycle because he had correctly grasped the needs of the mass consumer, paying attention to "the situation of the industry and the society".²¹ We should not forget that in his childhood, Matsushita was a servant boy in a bicycle shop.

In 1927 Matsushita offered a square bicycle lamp for sale, which could be used for fifty hours in succession, under the brand name 'National'. The same year, he produced an electric iron for sale as well. In those days electric irons often broke down at the heater or terminal. Because of this, and their high cost, irons had yet to be popularized. The iron that Matsushita developed was not only a technical improvement, but was 30% cheaper than the standard irons. The Ministry of Commerce and Industry designated the National iron, which was both capable and cheap, as a home article of superb production. The electric iron by Matsushita pioneered domestic electrification.

Afterwards, Matsushita produced a reflective method electric stove of 500 W, and an electric *kotatsu* whose mass production allowed it be sold for half of the then-market price. In 1930 Matsushita began to produce radios. In the radio set competition of Tokyo Broadcasting, the National radio receptor won first prize. As the National receptors rarely broke, sales figures were excellent, and it remained at the top of market for four years.

In 1933, only fourteen years since its foundation, Matsushita had grown to fifteen factories, including the newly-established Kadoma factory in Osaka, with more than two hundred clerks and over one thousand factory workers. The company made remarkable progress in marketing and came to affiliate two hundred agencies and 100,000 stores.

Matsushita led the domestic appliance industry for a number of reasons. "It kept offering products to the market with a modest profit constantly and without unreasonable gain".²² It pursued the fastest growth and was always enlarging its market share in the industry. Before the National electric *kotatsu* was made, "the products made by Mitsubishi monopolized the market share". But the National *kotatsu* was of excellent quality and sold for 2 yen, 70 or 80 cent, so that in 1933 it "occupied about 70 or 80 per cent of the total demand of the nation".²³

In this way, according to an innovative management policy, Matsushita sold his products by targeting families below middle class. In the Matsushita company, there existed a

20 See *Mainichi Yearbook 1927*, p. 750.

21 Konoshuke Matsushita, *My Way of Life and Thinking*, Jitsugyonomosha, 1968, p. 165.

22 *One Story a Day by Master Matsushita*, Buichikai in Matsushita Electric Manufactory, 1934, p. 18.

23 *Ibid.*

combination of vigorous enterprise and incentive, sustained by an vicious spirit, which could not be found among university-graduate managers.²⁴ Matsushita was the typical innovative worker, whose success began with a small town factory.

In Japan around the early twentieth century there were many and various kinds of innovative enterprises in the consumer goods producing industry that began, like Matsushita, at the domestic systems production stage. A good example is Tokuji Hayakawa, the first president of Sharp Corporation who, like Matsushita, succeeded in diffusing a brand name around the world. The history of technological development based on the small town factory comes sharply into focus.

From the beginning of the twentieth century various food industries rose to prominence. In 1908, Ichitaro Kanie, founder of the Kagome Corporation produced and sold tomato ketchup and Worcestershire sauce; in 1921 Toshiichi Ezaki produced and sold Guriko caramel; and in 1928 Denzo Ito, the first president of the Ito Ham Food Corporation, began his food processing enterprise. Each of these firms began as minor enterprises, later growing to lead the modern food processing industry, particularly in the field of marketing policy. Additional note should be taken of Zoojirushi Thermos Corporation and Tiger Thermos Corporation.

Janome Sewing Machine Corporation provides a good example of the second type of innovation. Two conditions propelled the popularity of Western clothes in women's fashion during the 1920s. The first was the massive increase in white-collar workers employed by government offices and firms, and the second the inroads women made into offices and workshops. The sewing machine became a decisive tool in spurring on the revolution in clothing that saw Western clothes replace the *kimono*. The development and production of a sewing machine that was cheap and of good quality was urgently required during this period. Nevertheless, there was no mass production of sewing machines at this time.

Why was the mass production of a Japanese sewing machine delayed? In the first place Singer Sewing Machine, an American firm, had managed to conquer the entire market with an 80 per cent share. It was difficult to produce a commercially viable sewing machine that could compete with Singer, which was able to draw on large amounts of capital, an installment-payments system, and considerable expertise in high technology.

Singer Sewing Machine's success in the Japanese market came after World War I, when Japan increased its imports of sewing machines virtually overnight. In 1914 imports amounted to 200,000 yen but by 1917 had increased to over 1,000,000 yen. Imports continued to increase rapidly so that by 1920 the figure had reached 6,320,000 yen.²⁵

Secondly, because the machine industry in Japan was underdeveloped, no technological base for sewing machine production had been established. All existing manufacturers of sewing machines were limited to imitating or improving machines from Europe and the US. This was true for Shinjiro Koide who developed the Koide method sewing machine in 1911, Yasuji Sekine who manufactured a sewing machine in 1914, Tadatoshi Amari who manufactured a sewing machine for Japanese dress making, and Jiro Akiarashi, whose sewing machine was first manufactured in 1920. Moreover, mass-production of a sewing machine

24 See *ibid.*, pp 50-51.

25 Editing Committee of Janome Industrial Corporation, *50 Year History Since the Foundation of Janome Sewing Machine Co.*, 1971, p. 153.

was not possible, given the inadequate level of technology available for manufacturing.

The third reason was that kimonos were still popular in Japan. Although foreign clothes, particularly for women, were diffused throughout Japan, the overall market for Western clothes was still quite small.

It was only in the 1920s that pioneer entrepreneurs were able to overcome these impediments and mass-produce an indigenous sewing machine. In those days, there were businesses for repairing imported sewing machines, as well as some producers of parts in Osaka and Tokyo. Skilled artisans allowed entrepreneurs to progressively accumulate the technology to manufacture sewing machines. In the 1920s, Yosaku Koze, the founder of Janome Sewing Machine Corporation, and Masayoshi Yasui, the founder of Brother Sewing Machine Corporation, both made use of manufacturing technology that they had accumulated through the repair and parts business in order to mass-produce a Japanese sewing machine.

In 1929 Koze succeeded in manufacturing the Pine sewing machine, the first of its type, which after an eight-year experimental period was to become the national standard. He did so in collaboration with Shigeru Kamematsu, who was from a mechanical course at a Tokyo technical high school, Mitsuhiro Kurokawa, a manager of the Nakajima Sewing Machine Commercial Firm, a parts and wholesale merchant in Osaka, and Sumito Nagasawa, a teacher of Osaka Technical School.²⁶

The Pine sewing machine imitated Singer's mechanics within limits that would not be in conflict with patent rights. But the essential characteristics of this domestically produced machine were that all the parts were made in Japan and followed the Singer standard, thus making for interchangeability.

Singer relied on a high level of technology for the production of the 150 kinds of parts that went into its sewing machines. It took Koze eight years to manufacture his sewing machine because locally produced parts were not able to compete with the parts that Singer produced using advanced molding technology. In 1929 Koze and Kamematsu founded the Pine Sewing Machine Corporation, and began manufacturing the Pine sewing machines. Afterwards, Kurokawa and Yasui developed another domestically produced machine of the same standard as Singer.

In summary, the characteristics of this commercialization are the following: firstly the parts maker appeared and with it a production system based on skilled artisans; secondly, technology development followed through innovators such as Koze, Kamematsu and Yasui; and thirdly, a considerable amount of Singer's know-how could be used.

Various kinds of research and development innovation emerged from the minor enterprises, as the case of the commercialization of an indigenous sewing machine demonstrates. Shigejiro Matsuda, who commercialized the three wheel truck, is a good example of such business activity. Matsuda's enterprise, which started from a minor business, became enormous after successfully riding the wave of motorization. Nowadays, Toyo Industry is well known throughout the world for having put the rotary engine to practical use. Another central figure in research and development innovation was the food-maker Nishizo Kurosawa who successfully commercialized butter and cheese.

Otsuka Shoemaking Corporation, founded by Iwajiro Otsuka, provides a good example of

²⁶ Kogakuin University, ed., *75 Year History of Kogakuin University*, 1964, pp. 65-66.

the third type of innovation. As previously stated, the wearing of foreign dresses by women, and of Western clothes in general, increased remarkably in the 1920s. With these changes in social customs, the demand for shoes grew as well.

Prior to the 1920s the main demand for shoes came from the army and navy. The military's demand formed a foundation for the development of a shoemaking industry. The Japan Shoemaking Corporation (founded in 1902) and the Otsuka Commercial Firm (founded 1872) monopolized production of shoes for the army and navy respectively.

The growth in the demand for military shoes, owing to the expansion of armaments and the war, provided the opportunity for the emergence of a Japanese shoemaking industry. The Japan Shoemaking Corporation imported several Goodyear shoemaking machines from the US in 1910 in order to produce shoes for the military. Shoes for the navy, made by the Otsuka Commercial Firm, were manually produced. The quality of manually produced shoes was better than machine produced and they were better suited for individual orders rather than the mass-produced military orders.

Apart from the Japan Shoemaking Corporation, which began machine production, and the Otsuka Commercial Firm, which monopolized production of orders for the navy despite adhering to manual production, almost the entire shoemaking industry in Japan in the early part of the twentieth century retained small-scale management and manual production techniques. The state of the shoemaking industry in Japan during the 1920s however, came to differ with its state at the beginning of the century, because of the increase in the private demand for shoes.

In 1924, the Chiyoda Machine Shoemaking Company and the Standard Shoes Company were founded, both equipped with Goodyear production machines. Around the same time, the Otsuka Commercial Firm began machine production of shoes on the chance that the navy's standard would shift from manual to machine production. Earlier, in 1922, the Otsuka Commercial Firm had bought the Goodyear shoemaking machine, a patent of USMC (United Shoe Machinery Corporation of Boston, Massachusetts which was the largest shoe manufacturer in the world), and began producing shoes the following year. At the time that the machine's purchasing contract was being decided, USMC selected Otsuka as its North East agent. Between 1922 and 1929, USMC sent five engineers to the Otsuka Commercial Firm to prepare a production system which was to use the Goodyear machinery.

Iwajiro Otsuka, a founder of the Otsuka firm, brought to the job a strong sense of self-reliance and an attachment to manual sewing and shoemaking, a legacy of his earlier experiences in the industry. But Kikuo Otsuka, his thirty-year-old son-in-law, took advantage of the change in the navy's shoemaking standards, adopting a production system based around the Goodyear shoemaking machinery.²⁷

'100 Year History of Otsuka Shoemaking' credited the innovative steps of its management with the transformation of Otsuka's production: "The course oriented from manual system to machine system was never reversed". The management staff "must have persuaded the navy to maintain the shoemaking standard with the machine, even if there was a sign for the navy standard to go back to manual shoemaking because of the Great Kanto earthquake".²⁸ The

27 On production innovation at Otsuka company, see chapters 1 & 2 in Editing Committee of Otsuka Shoemakers, *100 Year History of Otsuka Shoemaking*, Otsuka Shoemaking Corporation, 1976

28 See *ibid.*, pp. 169-170.

editing committee's conclusions are an incisive assessment of Otsuka's production history.

In the 1920s mass consumer demand for shoes increased. Kikuo Otsuka grasped how the market was evolving and transformed the industry from manual to machine production in two ways. The first was through the use of the Goodyear shoemaking machinery. The second was by attaching the Otsuka firm to USMC's international standing. He managed this in spite of the fact that the machines had not been required to produce shoes for the navy. In this way, Kikuo Otsuka is one of the entrepreneurs most representative of minor enterprise innovation during the 1920s.

Among the minor enterprises in the consumer goods producing industries, there were many who actively introduced machines and technologies from Europe and the US, like Otsuka, growing to become large companies and the leaders of their industry. The Daiichi Kogyo Medicine Corporation in 1900 introduced a cleaning plant, made by the German company Reman, in order to mass produce soap. Hakuyosha Cleaning Corporation introduced a dry cleaning machine and the Hofmans press machine from abroad in 1925, mechanizing the factory and subsequently taking the lead in the cleaning industry.

In general, these businesses formed the top strata of the minor enterprises, in terms of management expertise and technological power. However, they did not perform machine production from the beginning, nor advance systems of capital investment as the large companies or *Zaibatsu* did. As the mass consumption society began to form, managers utilized the skills of their artisans in order to introduce machines and technology from Europe and the US, setting industries on a course toward machine production. The role of minor enterprises as innovators in the consumer goods producing industries, was an important condition to the realization of a mass consumption society in the 1920s.

Finally, I want to consider Japanese industrialization in the 1920s. As the above discussion has demonstrated, the most important factor in Japanese industrialization was the merging of science, technology and work. This combination was no more important than when industrialization was in its infancy. When compared with American industry, and the emergence of 'Fordism' in the 1920s, and Germany's use of science and technology in its postwar restoration, Japan could only boast relatively low levels of industrialization.

The work environment and quality of life in Japan during the 1920s was a lot harsher than that in the developed countries of Europe and the US. Cotton spinning girls had to work 16 hours a day, monotonously spinning in a factory filled with cotton dust. And Osaka, one of the largest industrial cities in Japan, produced 1,825,000 kilograms of soot and smoke every day. Industrialization in Japan was an asymmetric mix of the old and the new which produced a sense of constant confusion.

Fritz Harver, the head of the Kaiser Wilhelm research institute in Germany, visited Japan in 1924 on the invitation of Hajime Hoshi, a Japanese businessman. In Osaka on December 4, 1924, Harver stated to a group of businessmen:

I asked my Japanese friend to show me factory installations and I saw them...As a result I noticed that a primitive form and a modern form coexist, and in the same factory there are on the one hand, the most progressive installations introduced from abroad, while on the other hand there are ones which I recall from my homeland of my grandfather's time...It seems to us visitors that Japanese factory directors think

that all important machine tools are good and they believe the factory will be able to develop sufficiently from a technological point of view if these operations alone, are done well. However, we are convinced that these things are only preliminary conditions for the attainment of technological success and success itself will be impossible if sought only through these things. Lighting in the factory and sharing of workplace are very important. Whether products are good or bad depends on technological direction and scientific control of operations in each manufacturing process. A laboratory to improve the quality of products and the workplace must keep in contact with other parts of the factory constantly. Carrying out materials, transportation in the factory, useless human power and unproductive wages etc. have an effect on the production costs of a product. These things are comprehended in this country quite a different way from in Western industrial countries.²⁹

Harver did not only criticize the asymmetry of Japanese factories. He advised the Japanese to elevate “the intermediate class over a long period who has the role to connect science and production”, in order that there be “one class of a factory manager, a foreman, an overseer trained to be make technological and scientific judgments” for Japanese industry to become truly ‘independent’. At the same time, he urged Japan to “throw more energy into the extension of the schools which produce medium and lower class engineers”.³⁰

As demonstrated in the first half of this article, the creation of a large pool of engineers, who could bring with them knowledge of engineering and the ability to plan for development, was one of the nation’s most urgent tasks. The extension of the national technological school system illustrates this. There were many intellectuals who looked to the German standard in industrial education and advocated that a revolution in industrial education take place in Japan in order to create engineers, foremen, and skilled laborers.³¹

Harver noted, however, that full attention had not been paid to the extension of education to “foremen or overseers”. In those days, there were few facilities, apart from the Railroad Education Society, the Railroad Training Center, the Communications Training Center, the Workmen’s School and the Kanebo Worker’s School, which were dedicated to the education of foremen. In Japan in the 1920s, orthodox thinking held that it was a shorter route to import technology from Europe and the US, rather than invest energy into the technological education of workers, which required a longer-term perspective.

In this period, trade unions were not officially recognized, and were oppressed by the police. Consequently, the organization rate of trade unions was only 7.9% in 1931, the time when it was highest. As Japanese trade unions were very weak, they could not play a significant part in the campaigning for required technological training for workers.

Vocational education and social education at the elementary school level should have been

29 Fritz Harver, *A Collection of Addresses by Dr. Harver*, Iwanami Shoten, 1931, pp. 63-64.

30 See *ibid.*, pp. 50, 69-70.

31 Hakutaro Nishida, ed., *Technological Chemistry*, Sanshodo, 1921; This doctor of technology consistently drew attention to the necessity of technical education reform. See the following books and these about this discussion in those days: Hakutaro Nishida, *The Industrial World After WW II*, Sanseido, 1921; Hakutaro Nishida, “The Urgent Necessity to Educate Chemical Workers”, in *Technological Chemistry*, Vol. 4, No. 7, July 1920, pp. 2-4. Torao Sakuma, “On the Education of Urban Industry”, in Civil Research Commission, eds., *Prizewinning Theses*, 1926.

required in order to redress the poverty of industrial education among workers. But education at the elementary school level in those days focussed upon preparing students who would go on to secondary school. It ignored the children who would graduate from elementary school and enter the workforce.

Moreover, in the minor enterprises, which formed almost all of Japanese business, the more traditional system persisted, whereby older skilled workers, the *Oyakata*, dominated the other workers in a paternalistic fashion. This system was highly feudalistic in character and workers were expected to master technology over time, through practical experience.

Under the influence of a particular conception of technology that originated from Japanese society and a backward social environment, the problem of extending technological education facilities for workers was barely considered during the 1920s. But as Fritz Harver noted, it is indisputable that for Japanese industrialization to have been effective in this period, innovation was required in the technological education of elementary engineers, foremen, and skilled workers.

Conclusion

The concentration of population in cities and the remarkable westernization of urban life during the early part of the twentieth century spurred production of a variety of consumer goods by industries such as those that manufactured clothing, sewing machines, foodstuffs, beer, shoes, household appliances, and cosmetics. As this essay has shown, these urban industries rested by and large on the shoulders of proprietors running small- and medium-sized "town factories" (*machikōjō*). Stimulated by a continually expanding demand for consumer goods, they introduced innovations and manufactured good-quality consumer products at low prices. They became independent, and worked hard in true entrepreneurial spirit; moreover, they developed original marketing strategies. Such were the strengths of the consumer manufacturing sector.

The mass consumer society created in Japan after World War II did not by any means begin from square one. It was premised on the production of consumer goods that had already been established by pioneering industrialists at the beginning of the twentieth century, and the budding consumer society that came about as a result. This is demonstrated figuratively by the fact that most of the well-known companies that act as major television sponsors today can trace their lineages one way or another back to the pioneering firms of the early twentieth century.

Furthermore, the innovators of the time, both well-known and unknown, became an important motivating force in revolutionizing the Japanese economic system, which differed greatly in terms of economic and technological levels when compared with Europe and the United States. Due to the creative destruction made possible by the innovations of the early twentieth century, a foundation was laid for the creation of today's Japan, one of the world's first-rate industrial powers. Moreover, the budding formation of the consumer society that came about as a result of the innovators' technological challenges made it possible for new values to take hold in Japan, as symbolized by new consumer lifestyles and by leisure. Along with the infiltration of modernism into society, which was linked to the consumer revolution,

this was an opportunity for the gradual retreat of concepts such as hard work and frugality, which had been regarded as the philosophical framework of the so-called "Meiji order." Nevertheless, the influences of traditional moralism and low income levels persisted during this period, and the consumer revolution remained lukewarm.

When considering the role of small and medium scale capital in encouraging the independence of urbanized industries and the budding formation of a consumer society, we should discuss why the level of innovation of small and medium capital was low in comparison with its European and American counterparts. The key management task for Japanese firms in the 1920s was to rationally achieve a new combination of science, technology, and labor. This was a pressing issue for the industrialists in urban industries who stood face-to-face with a stunning consumer revolution. That is to say, because they ran town factories that were for the most part small-scale operations, reforming the values and paternalistic labor system that had existed up to that point and realizing the training of mid- and low-level technicians with creative ability were urgent tasks. Many of the pioneer industrialists were interested not only in worker training, but also absorbed into their own firms technicians who worked for the large firms, which excelled in developing new technologies.

It has already been shown that institutions such as the National College of Industry (*Kokuritsu Kōgyō Senmon Gakkō*), the Railroad Educational Society (*Tetsudō Ikueikai*), the Railroad Training Center (*Tetsudō Kyōshūjō*), the Communications Training Center (*Teishin Kōshūjō*), the Workmen's School (*Kōshu Gakkō*), and the Kanebō Workers' School (*Kanebō Shokkō Gakkō*) implemented the mass training of mid-level technicians. But as a shortcut for the nation as a whole to realize the new combination of science, technology, and labor, the method of importing sophisticated machinery and technology directly from the United States and Europe became the norm. It need hardly be said that for the urban industries' town factories, which were inferior to the big firms in terms of technological standards and capital strength, solving the problem of rationally integrating science, technology, and labor was extraordinarily difficult. Regardless of the weaknesses of this sort of entrepreneurship, at the town factories which formed a part of the mass consumer goods production sector, industrialists, technicians, and skilled workers all contributed passionately to the goal of achieving the independent domestic production of consumer goods. As a result of their pioneering manufacturing activities, Japan was fortunate enough to reach the threshold of a consumer society during the early twentieth century.

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1920年代日本における大量消費社会の萌芽的形成とイノベーション

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要旨：現代、日本製の消費財が世界市場を席捲している。その結果、国際社会における日本経済の在り方が批難されている反面で、日本経済のダイナミックな発展を推進したイノベーションに対する関心が世界中で高まっている。したがって我国の大量消費社会の萌芽的形成と結びついたイノベーションがいつから始まったかを明らかにすることは、経済史研究の魅力的なテーマである。

本稿では1920年代日本における消費構造の変化及びイノベーションの発展と、現代日本の社会と技術革新との間の連続性と非連続性について考察した。本稿ではとくに国際比較の視点に立って、A人口の都市集中、B不況の進展と物価の下落、Cデモクラシーの発展と諸制度の改革、D大量消費社会の端緒的成立とその概観一の分析を通じて課題に接近した。大量消費社会の端緒的形成との関連において、1920年代のイノベーションの特質を、大企業の生産過程や町工場を基礎とした技術開発の諸類型を抽出しつつ、明確に規定した。