THE RISING COMPANIES AND THE ESTABLISHMENT 1905-1931: THE FORERUNNERS OF JAPANESE EXPANSION AND THEIR STRUGGLE FOR EMERGENCE

By

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ABSTRACT

The two main themes of the thesis are the growth of the highly distinctive rising companies and their conflict with the Establishment in the period 1905 to 1931.

The three rising companies discussed are the Suzuki Shōten, Japan Nitrogenous Fertilizers and Shōwa Fertilizers. The rapid expansion of these firms, each under a single, bold, dynamic entrepreneur, is contrasted with the sluggishness of established capital, as represented by the two Great Zaibatsu—Mitsui and Mitsubishi—and the textile majors.

The difference in investment behaviour was especially notable in the rayon and ammonia synthesis industries, where a great opportunity existed for those sufficiently resolute to seize it. By the end of World War I, chemists and chemical technologists existed in abundance, and specific foreign processes were available at prices low enough to allow profitable production. Domestic demand for both rayon and ammonium sulphate rose dramatically throughout the twenties. There was, however, considerable risk as the technologies were difficult and total failure was possible.

The origins of the dynamism of the rising companies and the lethargy of the established firms are discussed. The creative activity of the entrepreneurs of the rising companies was not the product of factors associated with any region, social group, type of education, or early work experience. It is possible that it was the consequence of moral debt repayment to the mother. The sluggishness of the Great Zaibatsu cannot be attributed to their managerial structure. It was

probably of compound origin, being rooted in their sense of security and attitudes to the West.

The rising companies clashed with the Great Zaibatsu-dominated Establishment on three occasions. From mid-World War I, Mitsui felt threatened by the explosive growth of Suzuki, and the giant combine, together with its political allies, attacked the rising company twice. Suzuki suffered a setback in the Rice Riots of 1918, when the firm's head office was destroyed by mobs incited to violence by the Seiyūkai. Suzuki, which was closely associated with the Bank of Taiwan, was forced into bankruptcy in 1927, as Mitsui engineered a run on the bank at a time when it could not be supported by the Kenseikai Cabinet.

With the Fujihara-Bosch Agreement of 1930, Mitsui and Mitsubishi, in collaboration with the Western nitrogen industry, moved to halt the construction of the two gigantic ammonia synthesis plants owned by Japan Nitrogenous Fertilizers and Shōwa Fertilizers, with the intent of forcing these firms into bankruptcy. The two rising companies defied this pressure by allying with anti-Establishment forces, activated by the revolutionary mood of the early thirties. The main motive of foreign capital in the Fujihara-Bosch Agreement was a desire to eliminate the emergence of new productive capacity in an industry that was already suffering from serious overproduction. The Great Zaibatsu may have acted under the duress of Western pressure, or in an attempt to attack the revolutionary forces which threatened their hegemony.

In the political changes of the early thirties, the bold, expansionist spirit which had characterized the rising companies in the

twenties, spread to the nation as a whole. These companies were the forerunners of Japanese expansion.

Of the minor themes, perhaps the most notable is the high ambition of certain sectors of Japanese society, as evidenced by the great oversupply of technical graduates and the often, almost fanatical response of the technicians to opportunity. The importation of technology comes sharply into focus; the technology gap, methods of technology transfer, and other related matters are discussed. In the final section, some interpretations of the philosophy of Japanese business are criticised.

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CHAPTER I

INTRODUCTION

I. THE PERIOD 1905-1931: PERSPECTIVE

This thesis is concerned with the years between 1905 and 1931 when Japan was still a developing country and a far cry from the economic giant of today. In order to understand the setting of the themes, it is necessary to briefly examine the progress of Japan up to the time of the Russo-Japanese War (1904-1905), and then to consider developments within the period itself.

During the two-and-a-half centuries of the Tokugawa Period which ended with the Meiji Restoration of 1868, Japan had been politically fragmented. Though the country had been divided into some 260 han (baronies), each of which enjoyed a considerable measure of autonomy in administration, justice and economic affairs, a ruling coalition of han, headed by the Tokugawa House, held so tight a control of inter-han relations and foreign policy that the country remained essentially at peace for the duration of the period. During the Tokugawa, the loyalties of the individual were to the han and not to Japan, but in the national revolution which was the Meiji Restoration local loyalties were superceded by national, and a highly centralized system of government came to be established with the support of the main active elements of Japanese society.

Until World War I, political power rested firmly with the groups

which had carried out the national revolution. Partly in response to agitation by a section of the people and partly as the window-dressing of a nation anxious to gain the acceptance of the West, a written constitution establishing a Diet was adopted in 1889. The real power of the Diet was to increase with the passage of time, though even in 1905 it still remained a subordinate organ of government.

While during our period the government played little role in the economy, in the first three decades of the Meiji Period (1868-1912) the state, reacting to the constant spur of possible Western conquest, established much of the economic infrastructure and actively encouraged economic development. A single currency was fashioned from the monetary chaos which had preceded the Restoration, and an adequate banking system was developed with special government banks to foster growth. An excellent land and sea transportation network was created. Building on a considerable heritage from the Tokugawa Period, primary education was extended to almost the entire population by the 1890's, while an able elite was educated at the state universities. The decade and a half prior to the Russo-Japanese War also saw the start of technical education.

Partly in response to government encouragement, but in the main as a continuation of the vigorous tradition of Tokugawa economic activity, there was a considerable development of private enterprise after the opening of the country to the West. In light industry, especially textiles, much Western technology had been assimilated by the turn of the century, and this sector developed quite rapidly. In heavy industry, and even more especially chemical industry, which were

more technologically complex, the rate of advance was very much slower and, even in 1905, Japan remained and was for long to remain, a heavy importer of most of the products of these industries.

The Russo-Japanese War marked the culmination of a period of rising Japanese prestige within the international community. Her political development and economic progress won her a degree of respect in the West accorded to no other non-occidental nation. Her reputation was enhanced by the defeat of China in 1895, while the victory over Russia—albeit a very close one—ensured her security in the Far East. Japan was henceforth the equal of many Western powers, but she was not Western and neither did the West accept her as such. This was one element which was to profoundly affect later developments.

Turning to the period 1905-1931, the economic developments will be outlined first, as they strongly influenced the pattern of events in other spheres. The economy expanded steadily throughout the period. Urbanization with corresponding growth of secondary and tertiary sectors continued, while the importance of agriculture steadily diminished even though half of the population was still rural in 1930. After World War I, because of the importation of cheap colonial rice and low world raw silk prices, a chronic depression enveloped the rural areas which was not to lift until the end of the thirties. In industry, the trends of the Meiji Period continued. Light industry, especially textiles, maintained its rapid growth, and by the twenties Japanese textiles were highly competitive on world markets. Heavy industry continued to develop more slowly, with technology and productivity

lagging the West considerably. The chemical industry began a belated development in the 1920's, but the volume of production in its modern sectors remained small until the end of the decade.

World War I, which offered very favourable marketing conditions, was marked by a great leap forward in industry and commerce. The war boom years were to afford a sharp contrast to the deflationary and rather depressed decade which followed. Although the economy expanded more rapidly in the twenties than in the Meiji Period, the population was also increasing at a high rate. Industrial development was insufficient to absorb all of the growing work force, and considerable unemployment and under-employment resulted. By the end of World War I, expectations had been raised by the heady war boom and the rising level of education. As the twenties progressed, increasing numbers came to feel that the pace of economic development was too slow.

The political history of the period is complex and interpretations vary. There is some ground common to all. None would dispute that there were two periods of swift political change—one at about the end of World War I and the other in the early thirties. Again, none would doubt that, in the first change, power passed from the oligarchy to a Cabinet which was essentially drawn from Dietmen and that, in the second, power was transferred from the Diet to a constellation of forces which centred heavily on the military. Where interpretations differ is in the nature of the political system between the end of World War I and the early thirties.

In the broad spectrum of opinion, most would incline to a position approaching the following interpretation which comprises one end of that spectrum. In Japan, from the adoption of the Constitution in 1889,there was a continual broadening of the democratic base and, with the death of the principal oligarchs in the late tens and early twenties, there was a transference of power to party cabinets responsible to a largely-elected Diet. These party cabinets ruled Japan in an essentially democratic fashion until the early thirties when the military became the principal influence in government. The positions of Borton[1] and Duus,[2] for example, are very close to this interpretation. A number of other writers like Scalapino[3] would take a position some distance toward the other end of the spectrum.

At the other end of the spectrum is a school of opinion which has few advocates today, but would have been supported by many Japanese in our period. For this school, the sway of the oligarchy was succeeded,not by democratic government, but by the rule of money power(and especially that of Mitsui and Mitsubishi),acting through the agency of a nominally democratic Diet. The political change of the early thirties is seen as the replacement of zaibatsu power by that of the military.

A considerable part of this thesis concerns the inter-relation of business and politics. Such inter-relation as I have described is only meaningful in the light of a position in the spectrum close to the interpretation of the second school. This is not to deny the validity of the ideas of the first school entirely. There is ample

evidence to indicate a very real broadening of the basis of true parliamentary democracy in Japan in the period from the adoption of the Constitution up to 1930. I would, however, strongly argue, both on the basis of evidence presented in this thesis and on other grounds, that throughout the entire period prior to World War II parliamentary democracy was shallowly rooted in Japan. Though the voice of principle was frequently heard and, at times, heard loud and clear, the principal springs of political activity of the times were not the conflict of contending political philosophies, but the clash of interest groups. Of these interest groups, Mitsui and Mitsubishi, which are styled the Great Zaibatsu in this thesis, were without doubt the most influential.

While largely following the second school of political interpretation, I have added an original element by describing the political change of the early thirties as a revolution, though many would disagree strongly with the use of this term. Much depends on one's definition of revolution. I have used the word to mean simply a forcibly induced, fundamental change in political direction, and this essentially describes the metamorphosis of Japan in the early thirties.

To be sure, there was little armed conflict, but this does not mean that there was little threat of the application of force. Just as, in the Meiji Restoration, the principal Bakufu supporters did not muster to the defence of the regime, as they realized that the opposing forces were too strong, so too did the Establishment of the twenties yield to overwhelming force in its turn without significant armed struggle. The Establishment, comprising the Great Zaibatsu and

their political allies, recognized by the time of the Manchurian Incident (September, 1931) that they no longer had the capacity to set national policy. Once it was backed by a public opinion angered by the deprivations resulting from the World Slump, the constellation of forces centring on the military was too strong to be opposed.

The change in direction was certainly fundamental. There was a drastic change in economic policy. The drive for a balanced budget, so important in the priorities of the twenties, yielded place to a stress on the promotion of rapid industrial expansion. The state, so passive in the twenties, came to play an increasingly large and direct role in the economy as the thirties progressed. In the political sphere after 1931, cabinet responsibility to the Diet declined very sharply, while in foreign relations the change was even more marked. The stance of accommodation to the West, which had characterized the twenties, yielded abruptly to a posture of defiance, as Japan commenced more than a decade of continental expansion in the face of the opposition of almost the entire occidental world.

II. THE THEMES

This thesis treats two closely related main themes. The first is the emergence of a spirit of aggressive enterprise in a number of new companies which I have styled the rising companies. The bold dynamism of these companies affords a striking contrast with the sluggish behaviour of established capital. The second theme springs from the first. It is the conflict between the rising companies and

the established firms. In developing the first theme I have sought to account for the difference in spirit of enterprise between new and established capital, and have considered such factors as managerial structure, age of the managerial group, the Japanese inferiority complex, the position of the firm in the economic hierarchy, and the personalities of the entrepreneurs of the rising companies.

The established companies include such presently well-known firms as the Mitsui, Mitsubishi, Sumitomo and Kawasaki combines, together with textile firms like Kanegafuchi and Japan Spinning. This thesis, aiming at depth rather than breadth, treats only a few of these companies: Mitsui and Mitsubishi, and a small number of the larger textile companies. The names of the rising companies are less familiar today, as these firms have either disappeared or exist under different names. They include the Suzuki Shōten, Japan Nitrogenous Fertilizers, Shōwa Fertilizers, Kuhara and Tokuyama Soda, but only the first three are treated. The rising companies expanded explosively in the industrial boom of the thirties to become the so-called new zaibatsu, which were surpassed in size by only the Great Zaibatsu themselves.

In presenting the first theme, I have sought to contrast the bold, determined spirit of enterprise of the rising companies with the timidity and hesitancy of the established firms. The performances of the latter are described first as a foil in Chapters II and III. Chapter II portrays the passivity of Mitsui and Mitsubishi, while

Chapter III demonstrates the pusillanimity of the major textile firms. The motivation of management is also treated in these chapters.

Chapters IV, V and VI describe the aggressive empire-building of three major rising companies: the Suzuki Shōten, Japan Nitrogenous Fertilizers and Shōwa Fertilizers. The careers and personalities of the entrepreneurs, who were the prime movers in the expansion of the rising companies, are of such importance that they have been discussed separately in Chapter VII, which compares their family backgrounds, early careers, main strengths, operating styles and basic constructive impulses.

It is in the approach to the new, technologically difficult and therefore risky industries where the differences in the attitude of management are best displayed. While other new industries are discussed, much of this thesis concerns two new chemical industries which constitute excellent touchstones of managerial approach. These are the ammonia synthesis and rayon industries, which are singularly appropriate for a number of reasons. Ammonia synthesis was the most advanced form of chemical technology in the period and, by the beginning of the twenties, it was apparent that it constituted the threshold to the major developing branches of the modern chemical industry. The chemical industry itself was clearly destined to be a much more important industrial sector than it had been in the past. The basic chemical technology of viscose rayon was much simpler than that of ammonia synthesis, but the production of commercially competitive thread required a high level of expertise in both the chemical

and spinning processes. The development of a rayon enterprise was thus also a risky undertaking. While the rayon industry was not comparable to ammonia synthesis in national strategic importance in the early twenties, it was clearly to be of great commercial value in the future. The rise of the level of technical competence in the chemical industry in general and in ammonia synthesis and viscose rayon in particular are described in some depth in Chapter II.

All three of the rising companies displayed great aggression in one or both of these industries. Of the two Great Zaibatsu, Mitsui demonstrated its characteristic over-caution, not to say timidity, in both industries, while Mitsubishi showed almost no interest in the entire chemical industry until the thirties. The textile companies, with enormous advantages over their rivals, showed incredible caution in the development of the rayon industry.

How does our first theme relate to existing knowledge? To what extent have historians recognized the contrast between the bold dynamism of the rising companies and the lethargy of established capital in our period of study? How have they viewed the differences in the 1930's between the zaibatsu and the new zaibatsu, which were the spiritual and material successors to the rising companies? After evaluating the present state of knowledge concerning the Japanese combines and the rising companies, the interpretations of the difference between the zaibatsu on the one hand and the new zaibatsu and the rising companies on the other will be examined.

Considering the importance of the subject, very little indeed has been published in English on the Japanese combines. The general histories make only occasional references to the combines, while none of the standard works on economic history provides any treatment in depth.[4] There are only two presently available, detailed works on the combines—a thesis by Hadley, presented in 1949, and a book by Roberts, published in 1973. The rising companies are scarcely mentioned in English-language texts; only Roberts makes any significant comment concerning them.

Among the English-language works, neither the general nor the economic histories distinguish clearly between the old and new zaibatsu. Borton, for example, among the general historians, does not even note the existence of any of the new zaibatsu, while Lockwood, in the most authoritative economic history of Japan, makes passing reference to a few of the individual new zaibatsu, but does not differentiate them from the old. Even Hadley's detailed treatment of Mitsui, Mitsubishi, Sumitomo and Nitchitsu does not make a distinction between the latter and the older zaibatsu. Roberts, while not clearly distinguishing between the structure and policies of the new and old zaibatsu, is the only writer in English to touch on the difference in investment policy of the rising companies and the zaibatsu in the twenties. For him, the "more adventurous" rising companies were simply foolhardy, and he commends the caution of the zaibatsu.[5]

Japanese-language material offers both contrast and similarity to its English counterpart in the coverage of the history of the

Japanese combines prior to World War II. In comparison to what is available in English, there is a considerable volume of writing in Japanese, but relative to the great economic and political importance of the combines to Japan coverage is sparse. Nor are the deficiencies those of quantity alone. The quality leaves much to be desired, as the treatment is largely superficial. In part, this is a consequence of a lack of data, resulting from the secrecy which has veiled the activity of much of Japanese business in general and the zaibatsu in particular. The rationale for this secrecy is not far to seek. Prior to World War II, business activity was frequently a grim and desperate struggle for existence, and most firms feared to give any information to rivals. The postwar period was easier and more enlightened, but competition remained keen, and the zaibatsu were for long concerned to avoid publicity of their involvement with the military in the thirties and early forties. A number of Japanese-language monographs cover the histories of the principal zaibatsu and new zaibatsu prior to World War II.[6] The combines also receive fairly extensive treatment in a number of industrial histories, while some of their leaders figure in both essay and book-length biographies. With few exceptions, these sources are uncritical of their subject matter, and make little attempt to relate it to the general politico-economic context.

Although the Japanese writers have largely ignored the activities of the rising companies in the period prior to 1931, many have distinguished between the new zaibatsu and the zaibatsu in the thirties. They have, however, largely viewed the difference in terms

of a distinction between production and finance capital,[7] and have failed to see the difference in the spirit of enterprise. A few writers have contrasted the dynamic investment activity of the rising companies in the twenties with the sluggishness of the zaibatsu. Shibamura, for example, makes a number of passing references to the energy and courage of the rising companies and to the lethargy of the old zaibatsu. The main contribution, however, is an article by Morikawa,[8] who has performed a valuable service in focussing attention on the difference between the two types of company, though he throws little light on the reasons for their contrasting investment attitudes. Most writers on the history of the combines have either not noted the difference, or like Kajinishi[9] have downplayed it.

The second main theme is the attack by established capital on the rising companies, as it moved to defend its position. Chapters VIII and IX describe Mitsui's attack on the Suzuki Shōten in 1918 and 1927. The conflict in both years was fought in the political rather than the business arena. In 1918, Mitsui attacked Suzuki because it was both a dreaded commercial rival and a supporter of the oligarchy whose power the Great Zaibatsu sought to destroy. Suzuki did not suffer greatly in this assault, but in 1927 the combine was forced into bankruptcy during the Bank of Taiwan Crisis.

Chapter X discusses a dramatic move by Mitsui and Mitsubishi to halt large-scale plant construction, which was vital to the existence of Japan Nitrogenous Fertilizers and Shōwa Fertilizers. The two rising

companies, although hard-pressed by Great Zaibatsu power, were able to resist their pressure by allying themselves with newly-active, anti-Great Zaibatsu political forces, which became the prime movers in the revolution of the early thirties.

If there are few English-language sources treating the history of Japanese combines prior to World War II, there are almost none which deal with intercompany rivalry and conflict. Apart from brief coverage of the struggle between Mitsui and Mitsubishi in the earlier part of the Meiji Period,[10] the field is almost untouched. Japanese sources offer more information, but even here the fare is meagre in the extreme. The rivalry of Mitsui and Mitsubishi prior to World War I has been covered by popular writers,[11] but little real research has been done even in this area. Other intercompany rivalry prior to World War I has received little attention, while the interwar period is virtually a virgin field. No work treats intercompany conflict or any aspect of that conflict as a major theme. Apart from Shiroyama's work on the Suzuki Shōten at the time of the Rice Riots, there are only a few scattered and frequently oblique references in industrial and company histories. This is hardly surprising. Contemporaries who had first-hand knowledge feared to become involved, while recent writers have felt constrained by an almost critical shortage of documentary evidence.

In treating the major themes in the body of the thesis, a considerable amount of information concerning several minor themes

has been presented. This information is summarised and the minor themes discussed in the Conclusions.

Two of these themes—the enthusiastic response of the technicians to opportunity and the great oversupply of chemists and chemical technologists—relate to the high level of ambition among certain sections of the Japanese people. The economic and political implications of this are examined. A third group of topics relates to technology and international technology transfer in the chemical industry. Discussion is based on information contained in the case studies presented. A further section is a critique of the philosophies of business put forward by Ranis and Marshall, in the light of the attitude of the entrepreneurs of the three rising companies. The last minor topic treated in detail is the ferocity of intercompany conflict in our period. Although this comes into focus very sharply in the Conflict Section, it has not been emphasized in previous business studies. The treatment of the minor themes concludes with a note on the possible origins of the deflationary policies of the twenties.

INTRODUCTION

FOOTNOTES

[1]Hugh Borton, Japan's Modern Century (New York: Ronald Press, 1955).

[2]Peter Duus, Party Rivalry and Political Change in Taishō Japan (Cambridge, Mass.: Harvard University Press, 1968).

[3]R. A. Scalapino, Democracy and the Party Movement in Prewar Japan: The Failure of the First Attempt (Berkeley: University of California Press, 1953).

[4]G. C. Allen, A Short Economic History of Modern Japan 1867-1937 (second edition, London: Allen & Unwin, 1962); and W. W. Lockwood, The Economic Development of Japan: Growth and Structural Change (Princeton: Princeton University Press, 1954).

[5]John G. Roberts, Mitsui: Three Centuries of Japanese Business (New York: Weatherhill, 1973), pp. 242-245.

[6]For example, Nihon Kontsuerun Zensho 19 vols. (Tokyo: Shunjūsha, 1937-1939).

[7]Yamaguchi Kazuo et al, Nihon Sangyō Hyakunen Shi (Tokyo: Nihon Keizai Shimbunsha, 1966), p. 228.

[8]Morikawa Hidemasa, "Senzen Nihon Zaibatsu no Jūkagaku Kōgyō Tōshi ni Kan Suru Kigyōshiteki Kōsatsu," Keizai Shinrin, Vol. 29, Nos. 1-4, 1961.

[9]Kajinishi Mitsuhaya (ed.), Seni Jō (Vol. XI of Gendai Nihon Sangyō Hattatsu Shi (Tokyo: Tōkōryō, 1964), p. 525.

[10]Yamamura Kōzō, "The Founding of Mitsubishi: A Case Study in Japanese Business History," Business History Review, Vol. 41, Summer, 1967.

[11]For example, Shirayanagi Shūko, Zaikai Taiheiki, 1929.

A. THE ESTABLISHED COMPANIES

CHAPTER II

THE GREAT ZAIBATSU

I. INTRODUCTION

The Japanese word "zaibatsu" in literal translation means "financial clique." The term actually covers a wide spectrum of enterprises, although it essentially implies a self-financing combine. In the interwar period, at one extreme, the word was applied to relatively small firms heavily concentrated in one narrow sector of industry with rather weak internal financial capacity. Furukawa fell into this category. At the other end of the spectrum, the word "zaibatsu" was applied to the greatest combines which had immense financial reserves, large trading branches, and a considerable number of subsidiaries active in industry. Mitsui was the zaibatsu par excellence in this category.

The term "zaibatsu" connotes nothing as to type of management, the age of the concern, or its general policy. The generation of combines which originated in the twenties and thirties were, however, distinguished from their older counterparts by the appellation "new." These "new" zaibatsu, as we shall see, were different from the "old" in style of management and spirit of enterprise.

In Japan before World War II and especially in the 1920's, two zaibatsu towered above all others. These were Mitsui and Mitsubishi—and they are styled the Great Zaibatsu in this thesis. Sumitomo is sometimes ranked with these two giants, but in fact hardly bears com-

parison. Though financially strong, it was much smaller than the other two, and lacked their range of industrial diversification and political influence.

II. EARLY HISTORY OF THE GREAT ZAIBATSU

By the mid-seventeenth century Mitsui had emerged as a medium-sized family concern. Its principal holdings were a large drapery shop in Edo and a money-lending business in Matsuzaka in present-day Mie Prefecture. The business grew steadily and, by the 1690's, it had shops in Kyoto and Osaka as well as Edo, and several hundred employees. In 1691 Mitsui was of sufficient importance to be appointed money-changer to the Tokugawa Bakufu and, from this time on, banking became the family's main business.

Due largely to its close relation to the Tokugawa government, the family prospered throughout the seclusion period, but with the disruptions of the Bakumatsu Period Mitsui and nearly all Japanese business suffered reduced profits or losses. In addition, as a major business closely connected to the government, Mitsui was repeatedly pressed for funds by the tottering Bakufu. The family, however, appears to have judiciously aided both sides in the struggle leading to the Meiji Restoration, and this foresight was rewarded when the new Meiji government sought its financial expertise. This link with the government was to continue.

Mitsui survived the troubled early Meiji Period, but grew rather slowly at first under a traditional type of management. The firm remained

centred on finance, founding the Dai-ichi Bank in collaboration with the Ono family in 1872, and establishing the Mitsui Bank in 1876. The world-famous trading company, Mitsui Bussan, was founded in the same year and prospered under the skilled modern management of Masuda Takashi. The subsidiary's London office was the first branch office abroad of any Japanese firm. Neither did Mitsui neglect industry. In 1887 the predecessor of Kanegafuchi Spinning was established under Mitsui's guidance, but the firm did not thrive for some time. The venture which became Miike Coal Mining was purchased from the government in 1888 and, under Dan Takuma's expert guidance, developed into a highly profitable enterprise.

Thus, by 1890, under energetic modern management, Mitsui Bussan and Miike Coal Mining had become pillars of strength, but the central organ, the Mitsui Bank, languished under the dead hand of tradition, and a number of subsidiaries were also ailing. Reform came with the appointment in 1891 of the forceful, westernized Nakamigawa Hikojirō to head the Mitsui Bank, who carried out a thorough program of rationalization which extended to all parts of the Mitsui empire. In the year 1900 the foundation of the Mitsui Zaibatsu was well and truly laid[1] (Table I).[2]

In contrast to Mitsui, Mitsubishi is of modern origin. The combine was founded and developed into a considerable enterprise by one man, Iwasaki Yatarō. Born the son of a Tosa peasant in 1834, he acquired a degree of wealth early in life, and travelled to Osaka where he became interested in commerce. When the four rebellious han (Satsuma, Chōshū, Tosa and Hizen) were arming, he profited from the weapons trade between Nagasaki and Tosa, and showed great ability, especially in his dealings with Westerners. With the

TABLE I

THE DIVERSIFICATION OF THE TWO GREAT ZAIBATSU

1868-1904	1905-1914	1915-1920	1921-1931	1932-1945
MITSUI				
Okioka Mine 1874 Mitsui Bank 1876 Mitsui Bussan 1876 Miike Coal Mining 1889 Kanegafuchi Spinning 1892* Mitsui Mining 1892 Fukuoka Paper 1893 Shibaura Engineering 1893 Miike Spinning 1898 Oji Paper 1898 Taiwan Sugar 1900	Hokkaido Coal & Steamship 1906 Japan Steel 1907 Tōshin Warehousing 1909	Taishō Marine & Fire Insurance 1918 Oriental Cotton Wool 1920	Mitsui Trust 1924 Oriental Rayon 1926 Mitsui Life Insurance 1927 Japan Flour Mills 1927	Oriental Otis 1932 Oriental High Pressure 1933 Mitsui Shipyards 1937 Mitsui Chemical Industries 1941 Mitsui Construction 1941 Mitsui Warehousing 1942 Mitsui Machinery 1943
MITSUBISHI				
Yoshioka Copper Mine 1873 Takashima Coal Mine 1881 Mitsubishi Iron 1875 Japan Mail Line 1875 Mitsubishi Exchange 1880 119th Bank 1885 Tokyo Warehousing 1887 Nagasaki Shipyards 1887 Kobe Paper 1898		Mitsubishi Shōji 1918 Mitsubishi Marine & Fire Insurance 1919 Shantung Agricultural 1919 Mitsubishi Internal Combustion 1920	Mitsubishi Electrical Machinery 1921 Mitsubishi Trust 1927 Mitsubishi Oil 1931	Japan Tar Industries 1934 Mitsubishi Steel 1937

*Kanegafuchi later left the Mitsui Combine by mutual consent.

success of the Restoration Movement, he came into possession of considerable property, including six steamships. These ships were the foundation of the Mitsubishi Zaibatsu.

Iwasaki displayed enormous energy and enterprise throughout the 1870's. In 1873 he founded a shipping venture, the Mitsubishi Trading Company, and soon defeated the Mail Steamship Line which was linked with the Meiji government. After 1874 he himself gained state support and, in the mid-seventies, ousted the U.S. firm Pacific Mail from the Japan to Shanghai run, and even drove the British P. & O. Line from Japanese waters. During the Satsuma Rebellion of 1877, Iwasaki profited greatly as the principal shipping contractor supplying the government forces.

After 1881 the government of Japan passed exclusively into the hands of oligarchs drawn from the former Satsuma and Chōshū Hans, and the government came to favour Mitsui which was closely associated with the Chōshū oligarch, Inoue Kaoru. Mitsui, with government backing, established a large shipping firm, the Union Transport Company, to combat the Mitsubishi merchant shipping empire. A savage trade war ensued, but Mitsubishi was ultimately victorious. Parallelling their rivalry in trade, the two firms also clashed in the political arena in the early eighties, as Mitsubishi backed the Kaishintō and Mitsui supported the Jiyūtō.

During the maritime trade war with Mitsui, Iwasaki came to realize the value of diversification, as he received support funds from his Yoshioka Copper Mine. After the end of the trade war, he initiated a vigorous diversification program, which was continued by his successors.[3]

By the turn of the century, the Mitsubishi Zaibatsu was also well established (Table I, page).

The last quarter of the nineteenth century was the heroic age of the Great Zaibatsu, with both combines responding aggressively to the opportunities of the new era. After the turn of the century, there was a slackening in their drive to expand as they became established and each came to accept the existence of the other.

III. DIVERSIFICATION OF THE GREAT ZAIBATSU

By the early 1890's, each of the Great Zaibatsu was starting to assume the form which was to characterize it by the end of World War I. Mitsubishi had made the logical addition of shipbuilding to its original base in shipping and, in 1885, had added a banking division necessitated by the firm's loss of central government support. It had further diversified in mining. Mitsui, which had been centred on banking and trade immediately after the Meiji Restoration, had diversified more widely but more haphazardly than Mitsubishi. It had moved into mining, cotton spinning, paper manufacture and, on a rather small scale, into engineering.

In the period from the early nineties until World War I, Mitsubishi established no new companies, but diversified by setting up an extensive engineering complex designed to serve its shipbuilding arm. Mitsui, apart from a move into iron and steel with the founding of Japan Steel in 1907, also diversified relatively little until World War I, being content to expand its existing base.

World War I and the twenties saw Mitsubishi further expand the engineering complex, moving into internal combustion engines in 1920 and electrical machinery in 1921. The firm also established a full-scale trading arm in 1918 and moved into insurance in 1919. Mitsui moved into shipbuilding with the establishment of the Tama Shipyard in 1917, and also developed a chemical division during the war. Both of these new ventures were administered by Mitsui Mining. The combine continued its tradition in textiles by establishing a rayon venture in 1926, and branched into insurance in 1918 and 1927.

In the thirties Mitsubishi greatly expanded its industrial complex and, for the first time, added a chemical division in 1934 called Japan Tar Industries. Rather random diversification continued to characterize the Mitsui Zaibatsu in the thirties and few really new divisions were established. Oriental High Pressure, founded in 1933, and Mitsui Chemical Industries, established in 1941, simply continued branches already established within Mitsui Mining. The combine did not benefit to the same extent as Mitsubishi from the boom of the thirties, as it had a much smaller base in those industries which related to military procurement.

IV. GENERAL RECORD IN INDUSTRIALIZATION

The pre-World War II major zaibatsu and especially the Great Zaibatsu have been written into Western histories as flag bearers of technological modernization and industrial and commercial defenders of the Japanese state. For example, G. C. Allen concurs with Bisson's

assessment of the role of the zaibatsu (by which he meant mainly the two Great Zaibatsu) in the period from 1914 to 1932 when he wrote:[4]

> Whatever objections there may be on social and political grounds to such a concentration of economic power, there can be little doubt that it assisted in the accumulation of capital and that it contributed "strength, efficiency and sureness of purpose" to Japan in her period of rapid economic development.

It is true that there were two periods prior to World War II when the Great Zaibatsu did act as national defenders and vigorous entrepreneurs in new fields of endeavour. In the heroic age of the Great Zaibatsu from the Meiji Restoration to the early 1890's, they repelled the foreign shipping companies and, to some extent, the foreign traders; they introduced modern shipbuilding and mining technologies into Japan; and they played an important role in the development of the cotton spinning industry. Their reputation in Japan during the Meiji Period was, thus, considerable. Between the early thirties and the end of World War II, the Great Zaibatsu were also extremely active, but this activity had different causes. The earlier energy had been that of able and highly ambitious men intent on self-aggrandisement. The later activity was largely forced on the Great Zaibatsu by the competition of daring and energetic rivals, and by a people angered by past Great Zaibatsu contempt for their material welfare. In the atmosphere of the 1930's, the Great Zaibatsu had no choice but to expand boldly.

From about 1900 to the early 1930's, the Great Zaibatsu were far from aggressive in developing the national economy. They played little part in the building of the economic infrastructure or in the establishment of risky, technologically-difficult new industries.

This is not, however, to argue that they did absolutely nothing--this was not the case. Their activities, however, were of a much lower order than would be expected considering their vast financial resources, their huge pools of technical and commercial expertise, and their excellent liaison with the West. For combines which to a considerable degree controlled the government in the twenties, they did singularly little for the national welfare. This is not simply the view of the present writer--it was the opinion of most of the Japanese people themselves by the end of the twenties.

Let us look at the general record of Mitsui and Mitsubishi in industry from the late 1890's to 1931. This period falls into two sub-periods divided by World War I. Prior to the war, the so-called new industries were still mostly in their infancy, even in the most economically advanced countries of the West. By the end of the war, however, these new industries were developed on some scale in the West, and it was obvious that Japan's economic development would depend to a considerable extent on these industries.

Let us consider the period prior to World War I first. The Great Zaibatsu, in general, did not invest in those industries where the return of a large capital investment was spread over a long period of time, even though the technology was relatively simple. Railways, electric power generation, and city gas production were thus virtually ignored by Mitsui, Mitsubishi and the other zaibatsu. Prior to the war, the economic infrastructure was still in the process of formation and the development of these industries was vital to further economic

advance. Yet, the zaibatsu were almost entirely disinterested. Indeed, so great was the neglect of these investment opportunities by the zaibatsu, that the oligarchy established the Industrial Bank of Japan in 1900 expressly to fund these vital sectors.[5] While it was not to be expected that the zaibatsu would place the major part of their investment in industries where profit margins were, for the most part, rather low, it might have been expected that, as supposed pillars of the national welfare, they would have invested to some extent in such crucial areas.

The Great Zaibatsu were also slow to enter the iron and steel industry which offered great opportunities. In spite of the steadily rising consumption, no iron and steel plant on any scale existed in Japan until the government took the initiative. Only then was Mitsui stirred to invest in this vital and potentially highly-profitable field. While there had been moves within the government from the early 1890's to establish a state-run iron and steel industry, it was not until 1895, with the pressure of the Sino-Japanese War, that the Diet finally approved the plan of Matsukata Masayoshi, the Minister of Finance, for the construction of a large-scale iron and steel plant at Yahata in Northern Kyūshū.[6] Construction commenced the following year, and the plant was in full operation by 1905. The much smaller and less technologically advanced plant of Mitsui's Japan Steel did not come on stream until 1907. Mitsubishi took no interest at all in the iron and steel industry until World War I.

By 1913, of the five major plants in Japan[7] (Table II) only Yahata had an integrated works. In that year, Yahata was considerably

TABLE II

OPEN HEARTH FURNACE CAPACITIES BY COMPANY 1913

Company	Year of start-up	No. of furnaces by capacity				Annual steel capacity
		50	25	15	10	
Yahata Iron Works (Government)	1905	-	12	-	-	375,000
Japan Steel (Mitsui)	1907	2	4	-	-	158,000
Japan Steel Pipe (Asano)	1912	-	2	-	-	38,000
Sumitomo Steel Casting	1901	-	-	2	-	23,000
Kobe Steel (Suzuki Shōten)	1905	-	-	-	1	11,000

NOTE: All figures in tons.

more than twice the size of its nearest rival, Mitsui's Japan Steel, and ten times the size of the third-ranking Japan Steel Pipe, which was connected to the Asano Zaibatsu. Yahata's dominant role in the iron and steel industry continued into the interwar period. In 1926, for example, the government works manufactured fully 65.9 per cent of total Japanese pig iron production and 62.5 per cent of all raw steel made in Japan.[8]

Prior to World War I, the Great Zaibatsu, in common with most of the rest of Japanese industry, showed little or no interest in those new, technologically intensive industries which had developed in the West. Japan did not, for example, develop the new branches of the chemical industry, which had grown to a considerable size in Europe by the start of the war. The Great Zaibatsu took very little interest in these new fields, although small enterprising Japanese firms did attempt unsuccessfully to develop rayon. At the end of the Meiji, the technical level of the chemical industry in Japan was considerably further behind that of Europe than it had been in the early 1880's.

The industrial staples of late nineteenth-century Europe were developed by the Great Zaibatsu, but technical levels and thus productivity remained very low up to World War I. In shipbuilding, for example, which was principally in the hands of the zaibatsu, in 1913 productivity in Japan was about one-fifth of that in the United Kingdom and one-third of that in the United States.[9] There is no evidence that productivity was significantly higher at Mitsubishi than at other zaibatsu yards in this period. Japanese productivity in coal mining,

which was largely zaibatsu-operated, also remained low by Western standards, suggesting inferior technology.

For Mitsui and Mitsubishi, the more technologically intensive staples were of subsidiary importance prior to World War I. This was especially true of Mitsui. The difference in scale between Mitsui's investment in the less technologically-intensive and the more technologically-intensive industries is well illustrated by a comparison between Kanegafuchi Spinning and Shibaura Engineering. In 1913, the capitalization of Kanegafuchi was 17,430,000 yen, compared to Shibaura's modest 500,000 yen.[10] In the case of Mitsubishi, the subsidiary nature of the more technologically intensive staples was not so clearly marked, but nevertheless shipbuilding was a much less important source of profit to the zaibatsu than its mining activities, or even its trade[11] (Table III).

In the period between 1914 and 1931, while the Great Zaibatsu did move into some of the new technologically-intensive industries, they were unaggressive considering their vast financial strength and great accumulated expertise. Their sluggishness is even more remarkable when one considers that they had a strong incentive to find new fields for investment in the reduced profits of their main branches in the period after the war boom. We will first demonstrate the unsatisfactory profit levels of the Great Zaibatsu and then consider their record in the new industries,[12] setting aside the chemical industry for special treatment later.

The fall in the profits of the Great Zaibatsu after the war must be established rather indirectly. Neither of the controlling companies,

TABLE III

MITSUBISHI GŌSHI: COMPARISON OF NET PROFIT BY DIVISION PRIOR TO WORLD WAR I*

Division	Net profit
Metal mining	1,637
Coal mining	1,047
Trading	1,141
Shipbuilding	1,032
Land	376
Banking	844

*The average of the three years 1912, 1913 and 1914

NOTE: All figures in thousands of yen.

the Mitsui Gōmei Kaisha and the Mitsubishi Gōshi Kaisha, published profit figures, so we must attempt to establish their profits by reference to data published by their subsidiaries.

Prior to World War I, Mitsui's principal sources of profit were the mining and trading divisions. In the twenties mining profits in real terms fell sharply from the levels of the preceding decade. Mining income came chiefly from the sale of coal, but the development of hydro-electric power and the diesel engine during and after the war greatly limited the increase in demand for coal. Japanese coal production in 1919 was 31,271,000 tons, but by 1929 it had only increased to 34,258,000 tons. Table IV[13] shows the fall in profits in terms of current yen, but measured in real money the drop was much greater. If the Tokyo cost of living index[14] for the two periods in the table is averaged and compared, then the average price level between 1912 and 1920 was almost exactly two-thirds of that between 1921 and 1929. If the profit of the period 1921 to 1929 of 52,647,000 yen is deflated accordingly, then a real profit of only 35,098,000 yen is obtained.[15] Not only were these profits in real terms sharply down, but the size of Mitsui Mining's coal operations had diminished sharply relative to the size of the Japanese economy in general and to the size of the manufacturing sector in particular. The production index for all Japanese manufacturing in the years 1925-1929 exceeded that of the period 1905-1909 by a ratio of 4.55:1.[16]

Thus, profits for the period 1921-1929 were down by an average of 2,178,666 yen per year in real money compared to the preceding nine

TABLE IV

MITSUI MINING PROFITS

Division	1912-1920	1921-1929
Miike Coal Mining	45,285 (67%)	34,284 (61%)
Other coal mines	9,421	18,363
Total coal mining	54,706 (81%)	52,647 (95%)
Other than coal	13,154	3,195
TOTAL	67,860 (100%)	55,842 (100%)

NOTE: All figures in thousands of yen.

years.

The profits of Mitsui's trading branch, Mitsui Bussan, were also low for much of the twenties. The firm paid low dividends for a number of years and, in one half-year period, failed to declare any dividend[17] (Table V). Mitsui Bussan's profits in the twenties were almost certainly far lower than in the boom years of the war, although we only have the figure for 1918 for comparison.

Were these low profits in the main branches compensated for by increased earnings from other sources? The answer seems to be a clear negative, although earnings from some newly-established firms made up some of the difference. Let us consider possible supplementary sources of income.

Spinning cannot have increased Mitsui's income, as profits were depressed in the twenties. The combine's activities in chemicals and engineering were on a small scale and also could not have contributed much. The only possible sources from which profits could have been augmented to a considerable degree were the three recently-established, finance-related ventures. What did these enterprises contribute to Mitsui's profits?

These firms were: Taishō Marine & Fire Insurance, established in 1918, Mitsui Trust and Mitsui Life Insurance, established in 1924 and 1927 respectively (see Table I, page). Let us consider the two latter companies first.

The Mitsui Trust, when figures first become available in 1927, was a source of modest profit for Mitsui. In that year it paid the

TABLE V

MITSUBISHI AND MITSUI: TRADING PROFITS AND DIVIDENDS 1918-1932

YEAR	PROFITS (1,000 yen)		DIVIDENDS (%)			
	Mitsubishi	Mitsui	Mitsubishi		Mitsui	
			1st half	2nd half	1st half	2nd half
1918	4,755	36,464	10.0	10.0	10.0	10.0
1919	876	19,864	10.0	-	8.0	19.4
1920	964	16,395	-	-	8.2	6.0
1921	-1,629	6,718	-	-	5.0	-
1922	1,791	11, 121	-	5.0	6.0	6.0
1923	1,963	10,164	6.0	6.0	6.0	6.0
1924	1,988	14,177	6.0	5.0	8.0	9.0
1925	952	16,226	-	-	10.0	10.0
1926	1,230	20,766	5.0	-	12.0	10.0
1927	1,836	15,573	5.0	6.0	10.0	10.0
1928	2,923	17,651	6.0	-	12.0	12.0
1929	387	17,558	-	-	12.0	12.0
1930	389	13,582	-	-	10.0	8.0
1931	-1,794	11,637	-	-	8.0	6.0
1932	1,397	11,901	-	8.0	6.0	10.0

same dividend as in the three preceding years—600,000 yen or eight per cent on paid-up capital. The carry-over amount was also not large—602,463 yen. While the firm had money in trust of no less than 206,394,849 yen, it had a paid-up capital of only 7,500,000 yen, and had holdings of only 3,974,230 yen in company bonds.[18]

Mitsui Life Insurance was considerably smaller. It paid a dividend of only 30,000 yen in 1927, or six per cent on the paid-up capital of 500,000 yen, with a carry over of only 9,432 yen. The firm's holdings were small; the most noteworthy being stocks valued at 3,851,794 yen.[19]

There are no figures available for Taishō Marine and Fire Insurance, but it was undoubtedly small. In 1938, the firm had a paid-up capital of only 1,250,000 yen, or less than one-fifth of that of the Mitsui Trust. If we assume that, like the Mitsui Trust, the firm paid eight per cent on paid-up capital, this would give a total dividend of merely 100,000 yen, supposing that the firm was the same size in the twenties.

Thus, assuming that Mitsui owned one hundred per cent of the shares of these three firms, the total dividends accruing to Mitsui would have been only about 730,000 yen per year; not nearly enough to significantly augment the income of the zaibatsu in the 1920's.

What of Mitsubishi? Again the case is much the same. All Mitsubishi's key sectors were hard-hit by the depressed conditions of the twenties. Prior to World War I, as we have seen, the zaibatsu had derived its main profits from metal and coal mining, trade and shipbuilding (see Table III, page). In the postwar period, the price of

all base metals was seriously depressed due to competition from foreign producers with very low costs and to stagnation of demand within Japan. Demand for coal, as we have seen, showed little increase. In trade, profits were also low in the twenties. During the decade, annual profit rose only once above two million yen and, in 1921, Mitsubishi's trading branch, Mitsubishi Shōji, suffered a substantial loss. No dividends were paid in a number of years (see Table V, page). In contrast, between 1912 and 1914, annual profits in real terms averaged approximately twice those of the period 1919 to 1930, and high yields are indicated for the war boom years by a profit of 4,755,000 yen in 1918. Shipbuilding was hard-hit by the over-supply of shipping on the termination of the war and by the naval disarmament programs of the twenties. Profits in shipbuilding during the twenties were very much lower than they had been in 1919[20] (Table VI). Mitsubishi profits were thus low in all key sectors.

Mitsubishi, like Mitsui, was unable to compensate for low profitability in the old industrial staples by new investment in finance-related fields. Mitsubishi had two ventures in this area and it is probable that neither provided much profit. Mitsubishi Trust, founded in 1927 with a paid-up capital of 7,500,000 yen, was very much the size of Mitsui Trust. No profit figure or dividend has been published, but it seems very probable that profit approximately equalled that of the Mitsui Trust, which was 600,000 yen in 1927. We have more definite information on Mitsubishi Marine and Fire Insurance, which was founded in 1918. The company, which had a capitalization of 1,250,000 yen, paid a dividend of 150,000 yen or twelve per cent in 1927. Its operations

TABLE VI

MITSUBISHI SHIPYARDS: NET PROFIT 1919-1929

Year	Net profit	Year	Net profit
1919	9,921	1925	4,827
1920	5,591	1926	3,529
1921	6,051	1927	3,336
1922	6,824	1928	3,774
1923	6,357	1929	3,499
1924	7,369		

NOTE: All figures in thousands of yen.

were much larger than those of Mitsui Life Insurance.[21]

Mitsui and Mitsubishi were thus left with very unsatisfactory profit-to-investment ratios in all key sectors, with little prospect of immediate improvement of these ratios for already-invested capital, or of future expansion of profitable investment in these fields. The combines were thus under some pressure to find new sectors for profitable investment. Under these circumstances, the Great Zaibatsu might have been expected to invest aggressively in new, technologically intensive industries, but they did not do this.

What were these new, technologically intensive industries? Technical innovations, made prior to World War I, had led to the establishment of a number of major new industries in the West by the postwar period. By 1920, the marine diesel engine was coming into use, and the aeroplane, though still not of great civil importance, was being manufactured in some quantity for military purposes. Automobile manufacturing by the early twenties was assuming considerable importance in the U.S. and, to a lesser extent, in Europe. It was apparent that these industries were destined to grow swiftly in the near future in the West, and some of them might well be established on some scale in the not-too-distant future in Japan. Yet the Great Zaibatsu took relatively little interest in them.

At the end of World War I, with the exception of chemicals, Mitsui was less well placed to enter the new, technologically intensive industries than Mitsubishi. The combine, though highly diversified and with considerable strength in its coal complex at Miike,[22] had only a weak

foothold in the engineering industries through Shibaura Engineering and the Tama Shipyard. During the twenties Mitsui did little to establish manufacturing capacity in any of the new mechanical industries. The company did not enter automobile, aircraft or diesel engine manufacture. Reflecting Mitsui's lack of stress on the engineering industries, the Tama Shipyard itself, although founded in 1917, remained under the management of Mitsui Bussan until 1937, when it became independent as Mitsui Shipyards (see Table I, page). The Mitsui subsidiary, Japan Steel, developed a major pig iron plant at Kamaishi after 1924, but the operation appears to have utilized no technology that was new to Japan,[23] although considerable technological upgrading was taking place in the contemporary West.

Mitsubishi was certainly more active than Mitsui but, considering the very favourable position of the company in the new mechanical engineering industries, it cannot be said to have aggressively exploited the opportunity offered.

Mitsubishi did enjoy some early successes in technology. In 1916, in cooperation with Kawasaki Shipyards of Kobe, the Kobe branch of Mitsubishi Shipyards developed a diesel engine for submarine use. During World War I, Mitsubishi researched automobile manufacture with some success and, by 1916, the combine had developed an aircraft engine, although some of its components were of foreign manufacture.[24]

In spite of these successes, the combine failed to develop an automobile manufacturing arm, although it would have enjoyed unparallelled advantages in this industry. In 1917, Mitsubishi built twenty

experimental passenger cars and, between 1918 and 1920, constructed four prototype trucks for the military under subsidy. In 1921, however, research was terminated. The reasons which are usually given for this decision include: the small size of the Japanese civil market due to low per capita income; the undeveloped state of the road system; the availability of other and cheaper forms of transport; and competition from U.S. manufacturers mass producing for a vastly greater home market. The real reason seems to have lain elsewhere.[25] Other manufacturers, subsidized under the Military Vehicle Aid Law of 1918,[26] did continue production on a small scale for the military market. These producers were: the automobile divisions of Ishikawajima[27] and Tokyo Gas Electric, Kaishinsha,[28] and Shirayanagi.[29] The military market was not such an easy mark as may be thought, as the military would not purchase if the price quotedwas greatly above the world price plus tariff.

While there was little immediate opportunity for considerable profit in the automobile industry during the twenties, the probable future returns were enormous. While the possible civil demand in the 1920's must have seemed very limited, the probable future military demand for vehicles was very large. The tank had proved its value in World War I, and trucks were coming into use for hauling artillery, transporting troops and carrying supplies. That Mitsubishi, so heavily committed to the engineering industries and so favoured in political connections, finance, organizing capacity and expertise, should abandon its foothold in the automobile industry, is surprising in the extreme.

Mitsubishi, while abandoning automobile production, continued to produce aircraft. The civil market for aeroplanes in the 1920's was even less assured than that for cars. The automobile industry was well-established in much of the West by 1920, but in no country was there mass production of aircraft until the 1930's.[30] In the twenties, not only was the current scale of the aircraft industry much smaller than that of the automotive industry, but the future must have also seemed less certain. Why did Mitsubishi persist in developing this risky new industry? The answer is almost certainly that, for Mitsubishi, it was not risky, and in fact profits in aircraft manufacture were assured. The profits of Mitsubishi Aircraft from 1927 to 1932 were almost constant; this strongly suggests that the combine was in receipt of a regular government subsidy[31] (Table VII).

There would thus appear to have been a fundamental difference in government policy with regard to the motor vehicle and aircraft industries. The inferior treatment accorded to automobile manufacture was a serious blunder. It was probably due to the failure of government officials[32] to appreciate the complex industrial structure necessary to maintain a successful automobile industry. It is interesting to note that Mitsubishi, until very recent times, was not a major manufacturer of motor vehicles and, even now, is heavily overshadowed by the automotive giants. Yet, it was the Japanese company which was by far the best-placed to enter the industry in 1920. Had Mitsubishi owned a functioning plant at the time of the large-scale military demand in the thirties, the company would almost certainly

TABLE VII

MITSUBISHI AIRCRAFT: NET PROFIT 1927-1933

Year	1st half	2nd half
1927	330	324
1928	307	305
1929	306	304
1930	305	307
1931	305	251
1932	280	381
1933	599	850

NOTE: All figures in thousands of yen.

have received a considerable proportion of the government's orders. In aircraft engine manufacture, thanks to an early start, Mitsubishi had a highly successful record, as the firm was well-placed to expand rapidly with the military build-up in the 1930's. By the beginning of World War II, Mitsubishi had a commanding lead over all competitors in aircraft engine production,[33] and the Mitsubishi Zero was to be by far Japan's most famous fighting aeroplane.

In summary, it can be said that, up to the early thirties, the salient features of Great Zaibatsu investment policy were:

1. They did not invest to any significant degree in industries which required large amounts of capital repayable over a long period. These industries, especially the railways and hydro-electricity, were essential components of the economic infrastructure.

2. The Great Zaibatsu, with few exceptions, avoided the risky, new, technologically intensive industries, unless their profits were guaranteed.

3. It seems probable that the Great Zaibatsu had a greater propensity to enter the new, technologically intensive industries prior to the war than after the war.

4. In neither the military nor the civil sectors did the Great Zaibatsu develop existing industries or initiate new ones in the interests of "national welfare."

We must now proceed to investigate the record of the Great Zaibatsu in the two new chemical industries, ammonia synthesis and rayon, during the period 1918-1931, as it is here that we find the clearest indication of the attitudes of the two combines. A great opportunity existed in these two industries, but Mitsubishi virtually ignored it, while the response of Mitsui was at best half-hearted. Before we can describe the response of the two great combines, however, we must establish the nature of the opportunity.

V. THE OPPORTUNITY

This section will examine the factors which contributed to the formation of a situation highly favourable to the development of the ammonia synthesis and rayon industries by the beginning of the twenties. We will first examine the development of Japanese chemical technology as a whole and the creation of a super-abundance of chemists and chemical technologists. We will then specifically discuss the ammonia synthesis and rayon industries, noting such factors as the availability and cost of processes and the development of markets.

Foundations of Japanese Chemical Technology

The Meiji government, intent on modernization, created an education system to produce an elite of pure scientists and technicians capable of original work and leadership. Chemistry was one of the areas of government interest. In this area, as in others, although the Meiji government sowed well, the harvest was to be long-delayed. In chemistry,

while the Meiji government supplied the initial impetus and the finance, the emphasis within the education system and the direction of research were to be shaped by powerful individuals within the universities.

While training in applied chemistry started with the adoption of the "Course in Practical Chemistry" at the College of Technology in Tokyo in 1877,[34] its real foundation in Japan was largely due to the efforts of one man. In 1884, thanks to the foresight and initiative of Professor of Science Takamatsu Toyokichi, a separate department of applied chemistry was founded in the face of considerable opposition in the Faculty of Technology at the Imperial University in Tokyo. In establishing the department, Takamatsu took the lead in the selection of staff, the choice of teaching methods, the design of the curriculum, and the selection of research topics.[35]

Takamatsu's stress on the practical application of chemical knowledge resulted from his experience in Germany. In 1879, at the age of twenty-eight, he travelled to England, where he spent one year at Owens University in Manchester. He then attended Berlin University for four years, studying tar product chemistry and specializing in synthetic dyes.[36] The German chemical industry up till World War I was by far the most advanced in the world, and in no branch was this superiority more marked than in synthetic dyes. In contrast to other countries, Germany placed great emphasis on research and stressed the production and marketing of the products of research. In no other country was there such close integration of the university and industry. In no other country was there such integration of science, technology and marketing.

Takamatsu could not but have been impressed with the scale, organization and technological modernity of the new organic chemical industry in Bismark's rising empire, and he determine to transplant what he could of the German technology, organization and spirit to the rather unpromising soil of Meiji Japan.

It would be difficult to over-estimate the role of Takamatsu in the introduction of applied chemistry. He not only performed noteworthy research in synthetic dye chemistry and, to a lesser extent, in the fields of carbon, soap and scent,[37] but he guided student research in such practical areas as seaweed chemistry. He not only introduced the German emphasis on chemical research for practical ends, but also transplanted the German tradition of graduate research into the Japanese universities, at a time when this was almost entirely lacking in the Anglo-Saxon countries.

On the firm base established by Takamatsu, education in applied chemistry advanced rapidly within the university, though for many years it was not to have the close integration with industry for which Takamatsu strove. At the Imperial University an expansion of training facilities in applied chemistry came with the establishment of the Explosives Department in the Faculty of Technology in 1887 and, in 1893, there was a further expansion when the Department of Agricultural Chemistry was set up.[38] In 1898, Departments of Pure and Applied Chemistry were established at Kyoto Imperial University, which had been founded in the preceding year. In 1910, yet a third centre of applied chemistry came into existence with the founding of Kyushu Imperial

University.[39]

The Meiji government, besides moving to create a scientific and technological elite, proceeded, though rather belatedly, to establish training facilities for middle-rank chemical technicians. In 1881, the Tokyo School for Industrial Workers was established. It was reorganized under the Special Schools Ordinance of 1904 as the Tokyo Technical College, and by that year it offered courses in dyeing, pottery and applied chemistry. Under the same Ordinance, the Osaka Industrial School was reorganized as the Osaka Technical College, and offered a curriculum which included brewing, as well as the three courses offered at the Tokyo Technical College. Earlier in 1903, a course in dyeing had been established at the Kyoto College of the Industrial Arts, which was founded in that year. With the Russo-Japanese War, four further technical colleges were created, and two of them, Yonezawa and Nagoya Technical Colleges, offered courses in dyeing.[40]

Government research institutions were also important in the creation of Japanese capacity in chemical technology.

Due to the initiative of Takayama Jintarō, the Tokyo Industrial Experimental Station[41] (TIES) was founded in 1900. Takayama graduated in pure chemistry at the Imperial University in 1878 and served in the Geology Branch of the Ministry of Agriculture and Commerce until 1889, when he travelled to Germany. There he studied for four years, receiving a doctorate of engineering in 1891. On return to Japan, he taught for a time at the Imperial University College of Engineering and, in 1897, was appointed Head of the Analysis Division of the

state-operated Mining Bureau. Takayama, like Takamatsu, was powerfully moulded by his German experience. It was almost certainly this influence which made him press for the creation of a state-run chemical technology research station.[42]

TIES came into existence as a sub-section of the Ministry of Agriculture and Commerce to conduct request analyses and to perform independently initiated experiments in industrial chemistry. Its initial staff was small; a head, four engineers, eight technicians and three secretarial personnel.[43] Early experimentation was confined to work designed to discover substitutes for chemical imports and to develop production technology for establishing chemical export industries.[44]

TIES expanded its range of activity steadily, though the number of staff remained relatively small (Table VIII). In 1903 a third division to deal with pottery and glass manufacture technology was added to the analysis and general experimental divisions. Three years later, in 1906, a fourth division was established to deal with the finishing of textile products and to work on synthetic dye technology.[45] A fifth division was added in 1909 to import electro-chemical technology into Japan. There had been considerable advances in this sector in Europe from the 1890's, but it was little developed in Japan, even though the country had considerable potential on account of its excellent hydro-electric power resources.[46]

Besides its activities in the import of foreign technology, TIES also served as a repository of foreign technical books and articles.[47]

TABLE VIII

NUMBER OF STAFF: TOKYO INDUSTRIAL EXPERIMENTAL STATION

Year	No. of engineers	No. of technicians	Total employees
1900	4	7	20
1914	14	18	126
1919	22	29	193
1927	21	25	183
1928	22	35	279
1929	28	40	296
1930	35	44	302
1931	36	44	301
1938	38	44	278

Some of the key staff at TIES spent considerable periods abroad. Odera, Head of the Analysis Division, spent nearly three years between 1908 and 1910 in the U.K., Germany and the U.S., studying electro-chemistry. Miyama, Head of the Experimentation Division, studied the applications of chemistry in the same three countries for a period of about one year.[48]

Thus, by World War I, TIES was playing a valuable, though limited role, in augmenting Japanese technical knowledge in a number of fields of applied chemistry.

During World War I, TIES expanded modestly. The total number of engineers increased from fourteen in 1914 to twenty-two in 1919, while the number of technicians rose from eighteen to twenty-nine.[49] There was one very striking development--the establishment of the Special Nitrogen Research Station (SNRS). This receives detailed treatment later (see pages).

The agricultural research centres played an important role in preparing the opportunity for a great advance in the chemical industry after World War I. They determined the regional suitability of chemical fertilizers and helped to popularize their use among the farmers. Popularization was by no means an easy task, as most of the farmers were poorly educated and extremely conservative. The state-run Komaba Agricultural School in Tokyo conducted research on the application of calcium super-phosphate as a fertilizer, and published a detailed report in 1891. Farmer participation in these experiments led to a wider dissemination of knowledge concerning chemical fertilizers.[50]

In 1893, the Agricultural Experimental Organization was founded with a main establishment at Tokyo and six widely distributed regional stations.[51] This organization also did much to promote the use of fertilizers.

The military contributed little to the accumulating pool of knowledge on chemical technology. While the Army and Navy had both commenced the manufacture of explosives early in the Meiji Period and had expanded their facilities periodically, basic research was neglected until after World War I.[52] Neither service attempted to develop civil industries related to explosives production, and the non-military uses of such chemicals as nitric acid were ignored.[53]

Naval modernization programs during and after World War I did contribute to the preparation of the opportunity in the chemical industry in the postwar years. Research on submarine submergence systems led to the development of high-pressure tanks, valves, air compressors, and other high-pressure equipment, vital to the industrialization of synthetic ammonia technology.

Bureaucrats, travelling on government missions in the West, occasionally transmitted some knowledge of new chemical technologies to Japan.

Oya Jun, who was later to become well-known as one of the chief executives in the chemical branch of Sumitomo, while serving as an official of the Ministry of Communications, was despatched to the West to investigate the electro-chemical industries, in order to find a means of utilizing the day-time electricity surplus. On his return to Japan in 1912, he presented a memorandum to the Ministry on the atmospheric

nitrogen industry in Europe, and also reported on the aluminum, carborundum, carbide, and calcium cyanamide industries of the U.S.[54]

Takamine Jōkichi, who was later to achieve world-wide repute as the discoverer of several drugs, played an important part in relaying knowledge on calcium super-phosphate manufacture to Japan. Takamine graduated in applied chemistry from the state-operated College of Technology in 1879, where his extraordinary facility in English was a great advantage at a time when most lectures were given in that language.[55] He joined the Ministry of Agriculture and Commerce, and was despatched to the U.K. for three years to study the chemical industry. He investigated electro-chemistry, soda and artificial fertilizer manufacture, and became interested in the technologically simple, calcium superphosphate industry. On return to Japan, Takamine was appointed Head of the Ministry's Engineering Bureau and, in 1884, on a reconnaissance for the Ministry in the U.S., he was impressed by a sample of phosphate ore from Southern California displayed at an exhibition in New Orleans. Investigation showed that the industry could be easily developed in Japan. He returned to Japan with six tons of calcium super-phosphate and offered samples to all who expressed an interest. In 1887 he persuaded a group led by Shibusawa Eiichi to establish a plant for the manufacture of super-phosphate fertilizer.[56]

We have discussed the steady development of Japanese knowledge in chemistry and chemical technology and the dissemination of that knowledge. We have noted the development of the higher education system, the activity of government research institutions, the

information-collecting activities of travelling bureaucrats, and the rather minor role of the military. The periodical literature supplies an excellent index of the progress of Japanese chemical knowledge.

Perhaps the earliest magazine to contain articles relating to chemistry in Japan, though its circulation was tiny, was Kōgyō Shimpō (Industry News). This periodical was devoted to the diffusion of engineering knowledge, and was produced at the College of Technology. Takamine Jōkichi and two of his classmates, prior to graduation in 1879, contributed a number of articles on chemistry, though these were, for the most part, merely translations from Western publications.[57] Japanese chemistry, then in its infancy, was at a highly imitative stage.

It would seem that knowledge of chemistry was insufficiently widespread in Japan to support a general circulation magazine until the late 1890's, when Kagaku Tsūshin Kyōju Sho (Chemical Communication Instruction Paper) appeared in 1897 and 1898.

Though Kagaku Sekai (The Science World), a general magazine which covered chemistry at a semi-popular level, appeared in 1908, the first really scientific articles did not appear until the start of publication of the monthly magazine Kagaku No Tomo (The Chemist's Companion) in 1909. This magazine, which continued publication until 1919, carried articles treating technical subjects at a fair level of sophistication. Let us consider some examples. Volume IX contained an article dealing in some depth with a process for the manufacture of nitric acid from ammonia.[58] Volume XI carried a contribution treating a method for the volumetric analysis of barium.[59] In a later edition of Volume XI, a fairly

sophisticated contribution dealt with the testing of drugs.[60] The appearance of this magazine signifies the existence, by 1909, of a considerable public with a fair grasp of pure and applied chemistry, and an interest in the chemical industry. There is a steady rise in the level of sophistication of the articles reflecting increased levels of comprehension, which becomes particularly marked after the start of World War I.

With the demise of Kagaku No Tomo in 1919, its place was taken by Kagaku Kōgei (Chemical Technology), which had commenced publication in 1918 and continued to appear until 1940. This journal was similar in format, content and level of sophistication to Kagaku No Tomo, though the editorial staff were entirely different. The Editor-in-Chief was a well-known figure, Dr. Nishida Hirotarō, who was also a frequent contributor.

A second magazine concerned with the chemical industry, Kagaku Kōgyō (The Chemical Industry), first appeared in 1922 and continued till 1943. Few copies exist at present, and its circulation may have been very small.

The start of publication of Kagaku Kōgyō Shiryō (Materials on the Chemical Industry) in 1928 marked a further stage in the advance of chemical knowledge in Japan. Not only were there now three regular journals treating chemistry and the chemical industry, but Kagaku Kōgyō Shiryō, in addition to the more general material which had appeared before, carried very highly technical articles on chemical technology. This reflected the growth of a technical class which could deal with chemical engineering problems of some complexity. The ammonia

manufacturing industry was especially well covered in this magazine. It ceased publication only with the advent of the war shortages in 1943.

With the move onto the quasi-war economy in 1937, two magazines appeared which were devoted exclusively to the chemical equipment, manufacturing industry. Kagaku Kikai (Chemical Machinery) was circulated between 1937 and 1944, and Kagaku To Kikai (Chemistry and Machinery) was published between 1940 and 1943. Both magazines dealt with the technical problems of equipment manufacture at a high level of sophistication, indicating the arrival of specialist, chemical machinery manufacturing on some scale.

The Japanese Chemical Industry

What of the Japanese chemical industry itself up to the start of World War I? By late Meiji, the state universities had established facilities for the training of chemists and chemical technologists and for research, which did not compare unfavourably with those in much of contemporary Europe. In contrast, the Japanese chemical industry itself was, for the most part, extremely unenterprising in the importation and industrialization of foreign technology. As we have noted, by the end of Meiji, the industry was further behind its European counterpart than it had been in the early 1880's. The considerable accumulation of knowledge at the universities produced little result in industry itself and, until the end of the Meiji Period, the two spheres remained almost entirely separate.

Some chemical industries had been successfully introduced into Japan early in the Meiji Period. Three essential industries, sulphuric acid, soda, and gunpowder, were developed as part of the state industrialization program. Sulphuric acid was a vital compound in the analysis of gold and silver. Soda, together with the related chemical bleaching powder, was essential for the production of Western paper necessary for the manufacture of bank notes. Gunpowder was an important base for explosives manufacture. Private enterprise, too, developed certain technologically simple fields in the early Meiji. Soap manufacture was the first, commencing in 1873, while matches and iodine followed in 1875. The production of chemicals for cosmetics began in 1881, and celluloid manufacture was developed from 1889. In all these industries the unit of production was small, most being of household size or little more. In 1888, the manufacture of super-phosphate fertilizer commenced at the plant of Tokyo Artificial Fertilizers.[61]

From the late 1880's on, the chemical industry for the most part stagnated technologically and, in spite of growing internal demand, production volumes remained small. The Japanese soda industry, for example, continued to use the Leblanc Process, which had started to be superceded in Europe by the late 1860's. Despite the high transport costs, a very considerable fraction of domestic demand for soda was filled by imports from Europe. In 1912, for example, imports of soda ash were 26,828 tons, while Japanese production was only 2,106 tons.[62] Important new branches of the chemical industry were not developed until very late in Japan. Ammonium sulphate, imported on an increasing scale

for use as a fertilizer, was not manufactured in any significant quantity until 1914. Even in that year, the plant which came on stream had a capacity of only 20,000 tons per year, compared to imports of 100,000 tons in 1913.[63] The synthetic dye industry, so important in Germany and long before introduced into most European countries, remained entirely undeveloped in Japan until 1914. In that year, Mitsui Mining commenced the manufacture of a few very simple synthetic dyes on an extremely small scale at the coal mining centre of Miike in Kyushu. Again, in this industry, there was no weakness of demand, as the rapidly growing Japanese textile industry required a large variety of synthetic dyes in great quantity. Even in some fields closely related to the manufacture of explosives, like glycerine, there was little activity. The first plant in Japan for the production of glycerine was established by Lever Brothers of the U.K. in 1912.[64]

We should note in passing that there were a few exceptional sectors of the industry, though in all but one the technology was simple. Calcium carbide and calcium phosphate expanded vigorously in the late Meiji and, at the very end of the period, the more technically complex field of calcium cyanamide was developed to a degree by the efforts of one remarkable entrepreneur, who will be treated at length later.[65]

Thus, by World War I, the chemical industry itself was extremely backward, but a considerable pool of technological knowledge and research expertise had been accumulated within Japan. We must now determine whether sufficient technical manpower existed in Japan during the

twenties to underpin a major advance in the chemical industry.

A Super-abundance of Technicians

While the Japanese chemical industry up till World War I was developing sluggishly, the national and prefectural institutions for the education of chemists and chemical technologists were being rapidly expanded. Let us now look at this contradiction more closely.

The results of a detailed survey conducted by Kamoi in 1918 are summarized in Table IX,[66] which shows the total number of chemists and chemical technologists produced in Japan up to and including 1917. Kamoi, allowing for deaths, estimated the actual number of Japanese-trained chemists and chemical technologists in Japan at 3,500 in 1917. Although Kamoi lists only public institutions, it is highly probable that there was no higher education in chemistry or chemical technology in private colleges prior to World War I, so no correction needs to be made on this point. A few Japanese were trained abroad, mostly in Germany, but there is no way of estimating their number.

Apart from Waseda, private universities up to 1932 produced few if any graduates in chemistry or chemical technology. Total enrollment in technology in private technical colleges was very low. It varied from 51 with the establishment of the first college in 1909 to a maximum of 301 in 1920. In the years 1921 and 1922 no private technical college existed, and after 1923 enrollment in technology at such colleges rose to a plateau of only about 115 students, which was maintained from 1926 to 1934.[67] No detailed analysis of subject content for the private

TABLE IX

PRODUCTION OF CHEMISTS AND CHEMICAL TECHNOLOGISTS TO 1917

Organization	No. of graduates
Tokyo Imperial University	1,182
Applied chemistry	362
Pure chemistry	159
Explosives	19
Drugs	252
Agricultural chemistry	390
Kyoto Imperial University	220
Industrial chemistry	142
Pure chemistry	78
Kyushu Imperial University	52
Applied chemistry	52
Tōhoku Imperial University	31
Applied chemistry	31
Tokyo Technical College	1,220
Dyeing	279
Pottery	198
Applied chemistry	488
Electro-chemistry	115
Teachers Training College	
Dyeing	53
Pottery	32
Applied chemistry	55
Osaka Technical College	840
Applied chemistry	322
Dyeing	25
Pottery	72
Brewing	421
Nagoya Technical College	99
Dyeing	99
Yonezawa Technical College	124
Dyeing	22
Applied chemistry	102
Kyoto College of the Industrial Arts	95
Dyeing	95
Kumamoto Technical College	0
No chemical course	
Akita College of Mining	0
No chemical course	
Kiryū College of Dyeing	0
No graduate by 1917	
Meiji College	38
Applied chemistry	38
Combined total	3,901

technical colleges is available. The almost negligible enrollment in technology courses is in marked contrast to the rapid rise of student numbers in commerce at private colleges, which rose from 251 in 1919, through 928 in 1926, to reach 3,867 by 1934.[68] The number of chemists and chemical technologists graduating from private institutions other than Waseda cannot be calculated, but it was undoubtedly very small. The output of these institutions will, therefore, be treated as nil.

Comparison with Europe is illuminating. Japan had a disproportionately high number of graduate chemists and chemical technologists, considering the small size of her total chemical industry and tiny research establishment. In 1914, there were approximately 9,000 chemists and chemical technologists at work in Germany. Almost all of these men would have been graduates of the universities and technical high schools. The highest pre-World War I figure for the U.K. shows only 2,000 employed chemical personnel, of whom probably only a small fraction were university graduates.[69] In Japan, by 1917, 843 men had graduated at the university level in chemistry, applied chemistry and explosives, and 1,120 at the technical college level in applied chemistry and electro-chemistry. If we reduce these figures in the same proportion as Kamoi to allow for deaths, then there were 756 university graduates and 1,005 technical college graduates. Let us take 1914, the start of World War I, as base year. Chemical production in that year would have been very much the same as in 1913. Let us estimate the number of chemists and chemical technologists in existence in that year. In 1918, there were 78 university graduates in chemistry and chemical technology[70] (Tables X and XI).

TABLE X

CHEMISTRY AND CHEMICAL TECHNOLOGY: UNIVERSITY GRADUATES 1918-1932
ANALYZED ACCORDING TO UNIVERSITY AND SUBJECT

UNIVERSITY & SUBJECT	YEAR														
	1918	1919	1920*	1921	1922	1923	1924	1925*	1926	1927	1928	1929	1930	1931	1932
University of Tokyo															
Applied chemistry	27	23	27	30	28	27	23	22	22	25	30	27	28	28	25
Pure chemistry	6	9	11	13	16	21	19	17	15	24	21	22	22	21	23
Explosives	4	4	3	2	3	4	2	2	2	3	4	6	6	7	3
Agricultural chemistry	36	46	46	47	41	35	43	42	40	44	47	47	37	52	38
Total	73	82	87	92	88	87	87	83	79	96	102	102	93	108	89
University of Kyoto															
Industrial chemistry	13	11	22	34	22	22	21	19	17	17	29	29	20	18	26
Pure chemistry	4	8	11	14	10	9	12	14	16	18	21	20	16	20	20
Agricultural and forestry chemistry	-	-	-	-	-	-	-	-	-	17	11	11	24	22	1
Total	17	19	33	48	32	31	33	33	33	52	61	60	60	60	47

TABLE X (CONTINUED)

UNIVERSITY & SUBJECT	YEAR														
	1918	1919	1920*	1921	1922	1923	1924	1925*	1926	1927	1928	1929	1930	1931	1932
University of Tōhoku															
Pure chemistry	10	1	14	27	15	17	16	14	13	17	11	9	16	16	16
Chemical engineering	-	-	-	29	17	20	19	19	19	19	15	14	18	12	20
Agricultural chemistry	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	26	1	14	56	32	37	35	33	32	36	26	23	34	28	36
University of Kyushu															
Applied chemistry	14	13	18	24	14	17	18	13	9	12	14	15	16	15	1
Agricultural chemistry	-	-	-	-	-	-	-	5	11	17	21	24	21	22	33
Total	14	13	18	24	14	17	18	18	20	29	35	39	37	37	34
University of Hokkaido															
Agricultural chemistry	-	1	-	21	25	21	24	17	10	19	15	16	15	16	17
Waseda University															
Applied chemistry	-	-	-	-	-	45	30	19	9	17	8	15	19	19	13

TABLE X (CONTINUED)

UNIVERSITY & SUBJECT	YEAR														
	1918	1919	1920*	1921	1922	1923	1924	1925*	1926	1927	1928	1929	1930	1931	1932
Tokyo University of Literature & Science															
Pure chemistry	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7
Hiroshima University of Literature & Science															
Pure chemistry	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
Tokyo University of Engineering															
Applied chemistry	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20
Electro-chemistry	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9
Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	29
Osaka University															
Applied chemistry	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20
TOTAL	130	116	152	241	191	238	227	203	183	249	247	255	258	268	298

*The number of graduates for these years was obtained by interpolation, as these sources were not available.

TABLE XI

CHEMISTRY AND CHEMICAL TECHNOLOGY: UNIVERSITY GRADUATES 1918-1932
ANALYZED ACCORDING TO SUBJECT

SUBJECT	YEAR														
	1918	1919	1920*	1921	1922	1923	1924	1925*	1926	1927	1928	1929	1930	1931	1932
Applied chemistry & chemical engineering	54	47	67	117	81	131	111	92	76	90	96	100	101	92	125
Pure chemistry	20	18	36	54	41	47	47	45	44	59	53	51	54	57	72
Explosives	4	4	3	2	3	4	2	2	2	3	4	6	6	7	3
Electro-chemistry	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9
Agricultural chemistry	52	47	46	68	66	56	67	64	61	97	94	98	97	112	89
Total	130	116	152	241	191	238	227	203	183	249	247	255	258	268	298

*The number of graduates for these years was obtained by interpolation, as these sources were not available.

As there are no figures available for the years 1915, 1916 and 1917, let us assume that there were the same number of graduates in these years as in 1918. This assumption is almost certainly on the high side, as the figures for 1918 were swollen by the war boom expectations. Thus, in 1914, there were 756 minus 234, or 522 university graduates. A similar correction, applied to the 1,005 technical college graduates[71] (Table XII), would give a total of 573 graduates in 1914. Again, the figure is probably much too low. Thus, there was a total of at least 1,095 qualified personnel in 1914.

In 1913, the production of the chemical industry in Germany, the U.K., and Japan was valued at £120 million, £55 million and £8 million respectively. Thus, in the case of Germany, per pound sterling of annual chemical production, there were 75×10^{-6} employed chemical personnel.[72] The corresponding figure for the U.K. was 36.4×10^{-6}. In Japan there were 137×10^{-6} graduates per pound sterling of annual chemical production. Thus, per pound sterling of chemical production, Japan had nearly four times as many graduates as there were chemists and chemical technologists employed in the U.K., and nearly twice as many as in Germany.

How can we account for this disparity? There is no evidence to suggest that there was a shortage of chemical personnel in Germany, and in the U.K. too the evidence strongly indicates that there was no demand for additional personnel.[73]

We could account for the disparity if the Japanese chemical industry had been highly oriented toward research and innovation, but it was not. Far from it. In 1914, the bulk of the industry was comprised

TABLE XII

CHEMISTRY AND CHEMICAL TECHNOLOGY: TECHNICAL COLLEGE GRADUATES 1918-1932
ANALYZED ACCORDING TO SUBJECT

SUBJECT	YEAR														
	1918	1919	1920*	1921	1922	1923	1924	1925*	1926	1927	1928	1929	1930	1931	1932
Applied chemistry	117	107	100	93	102	178	202	238	274	302	338	335	263	266	278
Electro-chemistry	27	25	20	15	21	52	54	56	59	50	54	57	35	40	34
Total	144	132	120	108	123	230	256	294	333	352	392	392	298	306	312

*The number of graduates for these years was obtained by interpolation, as these sources were not available.

of the old staples in which there was little innovation, and the new sectors, like syrthetic dyes and electro-chemistry, which required a larger research base, were little developed prior to the war.

The only conclusion can be that, in 1914, while large numbers of graduates in chemistry and chemical technology existed, for the most part they were not employed in the chemical industry. What percentage were employed in the industry? We can only estimate. The Japanese research commitment in 1914 was very much less than that of Germany, yet Japan had nearly twice the number of university and technical college graduates per unit of annual production. This strongly indicates that only a small fraction were employed in the industry—almost certainly less than a quarter and perhaps only a tenth. Thus, very probably, less than 273 of the qualified personnel were employed in the chemical industry.

Where were the graduates who were not employed in the chemical industry working? According to one historian of Japanese industry,[74] many worked in occupations like foreign dye sales, where to a degree their chemical knowledge was useful.

So much for the situation at the start of World War I. Was there an approach to full employment of chemistry and applied chemistry graduates in their chosen profession during the postwar decade? All the indications are that there was not.

In 1927, 5,361 men had graduated from the universities and technical colleges in pure and industrial chemistry (Tables XIII, XIV and XV). There is insufficient data to adjust this figure fully for deaths and retirement to give a total of those available for employment. We can

TABLE XIII

CHEMISTRY AND CHEMICAL TECHNOLOGY: UNIVERSITY GRADUATES CUMULATIVE TOTAL 1917-1932
ANALYZED ACCORDING TO SUBJECT

SUBJECT	YEAR															
	1917	1918	1919	1920*	1921	1922	1923	1924	1925*	1926	1927	1928	1929	1930	1931	1932
Applied chemistry & chemical engineering	587 (526)	641	688	755	872	953	1084	1195	1287	1363	1453	1549	1649	1750	1842	1967
Pure chemistry	237 (213)	257	275	311	365	406	453	500	545	589	648	701	752	806	863	935
Explosives	19 (17)	23	27	30	32	35	39	41	43	45	48	52	58	64	71	74
Electro-chemistry	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9
Agricultural chemistry	390 (350)	442	489	535	603	669	725	792	856	917	1014	1108	1206	1303	1415	1504
Total minus agricultural chemistry	843 (756)	921	990	1096	1269	1394	1576	1736	1875	1997	2149	2302	2459	2620	2776	2985
Total	1233 (1106)	1363	1479	1631	1872	2063	2301	2528	2731	2914	3163	3410	3665	3923	4191	4489

*The number of graduates for these years was obtained by interpolation, as these sources were not available.

NOTE: The figures in brackets denote the number of graduates in 1917 after allowing for deaths.

TABLE XIV

CHEMISTRY AND CHEMICAL TECHNOLOGY: TECHNICAL COLLEGE GRADUATES CUMULATIVE TOTAL 1917-1932
ANALYZED ACCORDING TO SUBJECT

SUBJECT	YEAR															
	1917	1918	1919	1920*	1921	1922	1923	1924	1925*	1926	1927	1928	1929	1930	1931	1932
Applied chemistry	1005 (902)	1122	1229	1329	1422	1524	1702	1904	2142	2416	2718	3056	3391	3654	3920	4198
Electro-chemistry	115 (103)	142	167	187	202	223	275	329	385	444	494	548	605	640	680	714
Total	1120 (1005)	1264	1396	1516	1624	1747	1977	2233	2527	2860	3212	3604	3996	4294	4600	4912

*The number of graduates for these years was obtained by interpolation, as these sources were not available.

NOTE: The figures in brackets denote the number of graduates in 1917 after allowing for deaths.

TABLE XV

CHEMISTRY AND CHEMICAL TECHNOLOGY: UNIVERSITY AND TECHNICAL COLLEGE GRADUATES COMBINED
CUMULATIVE TOTAL 1917-1932: ANALYZED ACCORDING TO SUBJECT

SUBJECT	YEAR															
	1917	1918	1919	1920*	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932
Applied chemistry & chemical engineering	1592 (1428)	1763	1917	2084	2294	2477	2786	3099	3429	3779	4171	4605	5040	5404	5762	6165
Electro-chemistry	115 (103)	142	167	187	202	223	275	329	385	444	494	548	605	640	680	723
Pure chemistry	237 (213)	257	275	311	365	406	453	500	545	589	648	701	752	806	863	935
Explosives	19 (17)	23	27	30	32	35	39	41	43	45	48	52	58	64	71	74
Agricultural chemistry	390 (350)	442	489	535	603	669	725	792	856	917	1014	1108	1206	1303	1415	1504
Total minus agricultural chemistry	1963 (1761)	2185	2386	2612	2893	3141	3553	3969	4402	4857	5361	5906	6455	6914	7376	7897
Total	2353 (2111)	2627	2875	3147	3496	3810	4278	4761	5258	5774	6375	7014	7661	8217	8791	9401

*The number of graduates for these years was obtained by interpolation, as these sources were not available.

NOTE: The figures in brackets denote the number of graduates in 1917 after allowing for deaths.

only refine it by deducting the number of deaths calculated by Kamoi for 1917, which gives a total of 5,159 for 1927. As by far the greater proportion of prewar graduates had entered the workforce after 1895, this figure would not be much above the actual total. In 1914, the probable maximum number of chemists and chemical technologists employed in the industry was 273. The value of Japanese chemical production increased 3.5 times between 1914 and 1927, rising from £8 million to £28 million.[75] Certainly, the research commitment of the industry rose sharply after 1914, but, even if we assume that the number of chemists per pound sterling of annual chemical production rose three times between 1914 and 1927, the increase in the chemical workforce would have only been 28 ÷ (8 ÷ 3), or 10.5 times the number of 1914. This would give a probable maximum chemical workforce in 1927 of only 2,866, as opposed to 5,159 graduates. To allow the number of jobs to equal the number of graduates in 1927, the number of chemists and chemical technologists employed in the industry, per pound sterling of production, would have had to increase a minimum of 5.4 times--5,159 ÷ (3.5 x 273). It seems unlikely that there were three times as many chemical personnel employed per pound sterling of production in 1927 as there were in 1914, let alone nearly five-and-a-half times as many.

Another approach also suggests that the output of chemists and chemical technologists in Japan greatly exceeded the intake of the industry in the 1920's. In the years immediately prior to World War I, the highly research-oriented German chemical industry had an intake of about 400 applied chemists. In 1913, the German chemical industry had

an output of £120 million, as compared to a Japanese output of £28 million in 1927.[76] Thus, the German chemical industry in 1913, with an intake of 400 chemical personnel, was about 4.3 times the size of the Japanese chemical industry of 1927. Even assuming a research commitment in Japan in 1927 equal to that of Germany in 1913--a condition which was very far from being fulfilled--it is clear that there was a great over-production of chemists and chemical technologists in Japan. Assuming a 1913 German level of research commitment, the Japanese intake in 1927 would have been about 93 graduates. The actual production of university graduates in chemistry and chemical technology in 1927 was 152, and the combined total of the universities and technical colleges was 504.

Several lines of indirect evidence support the view that there was an over-supply of technical personnel in general in the 1920's.

Firstly, no company or industrial history read by the writer, nor any interview conducted by him, indicates that any firm had difficulty in hiring qualified chemical personnel.

Secondly, a considerable rate of unemployment (or employment in an alternative inferior capacity) of chemists and chemical technologists seems highly probable, in view of the generally distressed condition of the middle classes in the 1920's and early 1930's. The evidence is qualitative rather than quantitative. In assessing the condition of the middle class or any other social group in the period, government statistics are valueless. The government did make surveys of employment, but these were conducted in such a way that few were reported as unemployed.[77] For example, a person who had worked for only part of a week

at an unremunerative temporary occupation in the traditional trades was classified as "employed." No detailed surveys were made by private organizations in the twenties and early thirties. According to the most detailed information available, by 1924, middle class unemployment was "becoming serious,"[78] and by 1931 the middle class as a whole was reported to be "sinking toward labouring class levels."[79] This very strongly indicates that a great over-supply of applicants for the "middle class" occupations existed.

Thirdly, the few statistics that are available indicate considerable distress. Of the total graduates from the universities in 1931, fully 41.5 per cent became unemployed.[80] The statistics simply distinguish between "employed" and "unemployed" and do not indicate the level at which employment was obtained.

Fourthly, one technician who had experience in the chemical industry in the early thirties stated that there was considerable unemployment among young technicians at that time.[81]

Why did people continue to enter the universities and technical colleges to train as chemists and chemical technologists if, as in many cases, they could not reasonably expect to find employment after graduation in their chosen profession? There were probably several reasons. Firstly, in the twenties, people were hoping for an upswing in business conditions. This hope was to be fulfilled in the early thirties. Secondly, as in present-day Japan, a university degree is not simply a technical qualification--a ticket of competence in a particular field--it is proof of a capacity for achievement. A degree in the

rather difficult disciplines of pure chemistry or chemical technology would be regarded as a certificate of general merit, awarded with honours, and the possessor could expect preferential treatment from a prospective employer. This was undoubtedly the principal value of the degree. There was yet a third reason which we have already touched upon. When a chemist or chemical technologist could not get a job directly in his field, he might obtain a position where some chemical or engineering knowledge was an advantage.

The evidence we have considered in this section indicates a high degree of distress among the "middle class" and "would-be middle class." Men were willing to train for long periods in difficult subjects, just in the hope of obtaining a better position. Yet many, probably the majority, were disappointed in their expectations. There is a parallel here with contemporary pre-Hitler Germany. In that country, the frustrated "middle class" assisted the rise of the Nazi Party in the early thirties. Might it not be that a powerful force behind the parallel rise of the Japanese military at the same period of economic crisis was the frustrated Japanese middle class?

By the end of World War I, a considerable educational establishment had been built up for the education of chemists and chemical technologists at the universities and for the training of chemical technicians at the technical colleges. Trained chemical personnel were in great over-supply, as the intake of industry was low. In striking contrast to the technological stagnation of the chemical industry, considerable

knowledge of pure chemistry and chemical technology had been introduced into Japan. Notable contributions had been made first by the universities, thanks to the dynamism of Takamatsu, who had early made applied chemistry on the advanced German pattern an important part of the curriculum. Government research institutions had also played an increasing role after 1900, while even bureaucrats travelling in the West had acted at times as useful industrial scouts. The periodical literature after 1909 abundantly attests to the existence of a considerable and increasing group of people who were well-informed on chemistry and chemical technology. The increase in the number of journals during the twenties and the rising level of sophistication of the articles carried clearly indicates considerable growth, both in the size of the group and in its level of technical comprehension.

We have outlined the rise of Japanese capacity in chemistry and chemical technology in general terms and have indicated that, by the end of World War I, a considerable level of sophistication had been attained. It now remains to consider two specific fields in depth, noting Japan's considerable technical capacity in these fields; the availability of foreign technology at reasonable prices, and the rapid expansion of the market.

The Opportunity in Ammonia Synthesis

The first and, for a decade, the only process for the catalytic synthesis of ammonia was the Haber. Very basically, the process consists of the reaction of hydrogen with nitrogen at high pressure and high

temperature in the presence of a catalyst to form ammonia. In the very first years of the twentieth century, Karl Bosch of Badische Anilin- und Soda-Fabrik began to re-examine the work of W. Ostwald, who had made the first study of the physical chemistry of ammonia. In 1903, his colleague Fritz Haber, using this work as a base, commenced research on the problem of ammonia synthesis and, by 1905, had demonstrated the theoretical possibility of catalytic synthesis. By 1909, Haber had developed a process, though it had only been tested on a very small scale. Haber and Bosch scaled up the process to a commercial-sized operation fairly rapidly and, in 1913, the Oppau Plant, utilizing the Haber Process, came on stream, though little information was made public.[82] Initially, the Haber Process had higher costs than the transformation process, but by 1920 the Haber was recognized as by far the cheaper, and it soon came to supercede the older process.

It is hard to over-estimate the significance of ammonia synthesis in the early twentieth century. First, it had considerable immediate economic value. Although the capital cost was high, it utilized cheap materials readily available anywhere, and the product was inexpensive. Second and more important, it represented the beginning of an entirely new phase in the development of the chemical industry. The same technology was later to be used in the synthesis of methanol, which was very important as an aviation fuel, and in the hydrogenation of coal to petroleum. Ammonia synthesis technology, too, was to strongly influence oil refining techniques and especially the use of cracker gases. It was the first process to involve the control of enormous volumes of

gases at high temperatures and pressures, and it thus set entirely new problems in chemical engineering and in material and equipment design.[83] According to the son of the developer of the Haber Process, L. F. Haber: "The confluence of the chemical and engineering sciences dated back to the 1890's, but with ammonia synthesis the junction of the two became the characteristic feature of modern chemical manufacture."[84] Thus, the process marked a barrier, which had to be crossed on some scale by any nation wishing to build a modern chemical industry. A nation or major company which did not seek to establish ammonia synthesis technology after the end of World War I cannot be said to have been seriously interested in the development of the most important branches of the modern chemical industry. The ammonia synthesis industry is thus a most valuable touchstone to analyze the attitudes of Japanese firms in the twenties.

How much did Japanese technologists know about ammonia synthesis in the years immediately after World War I? There is fairly conclusive evidence that a number of them knew a great deal. Let us first consider the government's record in ammonia synthesis.

Toward the end of World War I, the governments of a number of advanced countries came to believe that the development of a process for ammonia synthesis was an urgent necessity as a base for the vital explosives industry. Both the U.K. and the U.S., for example, conducted "crash" projects, though these did not succeed during the war. In present perspective, it is difficult to understand why such stress was placed on ammonia synthesis in the latter war years. Ammonia could be,

and in fact was, produced in great quantities by the transformation process. The costs were probably somewhat higher, but this would have been of little importance in wartime. The adoption of ammonia synthesis, as we have stressed, was a vital move in industrial strategy, but any long-term technological developments would have taken place well after any conceivable end to the war. Nevertheless, this general climate of emergency certainly existed,[85] and it impelled the Japanese government to establish the Special Nitrogen Research Station in 1919.

The initiation of the "crash" program on ammonia synthesis at SNRS was thought to be a colossal blunder by the vast majority of informed Japanese. Up till this time, the accomplishments of Japanese technology had been rather modest—though as we have seen this was more due to the failure of the Japanese capitalist than to a lack of competence in the Japanese technical class. Nevertheless, informed opinion held that an attempt to achieve high-pressure synthesis was beyond the capacity of contemporary Japanese technology.[86] The work at SNRS thus took place under some tension.

The Oppau Plant utilizing the Haber Process had come on stream in 1913 and, by 1917, forty to fifty per cent of German nitrogen production was by this method, but little information concerning the process was available in 1918. The official history of TIES maintains that Japanese technicians knew little about ammonia synthesis at the end of World War I. While this work is certainly correct in stating that the Japanese had no significant experience in the manufacture of almost all types of high-pressure equipment, it is definitely in error in its assessment of the

level of technological knowledge concerning ammonia synthesis.[87]

SNRS, although it was engaged in an emergency program, was far from mobilizing the total Japanese capacity in ammonia synthesis. As will be seen from the discussion below, there were a number of technologists with considerable experience in ammonia synthesis who were in no way associated with the project. This in itself suggests that Japanese capacity in high-temperature, high-pressure gas chemistry was considerable by the end of World War I.

Why did SNRS not make full use of the existing Japanese expertise? Personal jealousies may well have played a role. Some technicians were currently involved in rival projects, which could have brought them great profit, and thus may have been unwilling to assist in the government plan. It may have been that the directors of SNRS felt the mobilization of Japanese technicians working overseas unnecessary, as sufficient technical manpower was available in Japan. If this was the case, then the directors were quite correct. The career of SNRS was brief but successful.

Experimental work which started in 1918 fell into two broad categories: research to discover a suitable catalyst, and research on the synthesis process and equipment design.

Work on the catalyst was under the direction of Shibata Katsutarō, who had previously conducted research on ammonia synthesis and high-pressure gas equipment while a professor at the Tokyo Technical College.[88] Shibata was later to have a distinguished career in industry, which culminated in his appointment as President of Oriental High Pressure, a large Mitsui subsidiary. At SNRS Shibata researched a variety of types

of catalyst, seeking a product which combined low cost with the production of a smooth, steady gas reaction. He added the promoters barium and aluminum to the cyanides of iron and cobalt and also to potassium ferrocyanide. Shibata then introduced various heavy metals to these bases and experimented to discover the catalytic effect of the resultant mixtures. He found, however, that all catalysts so produced suffered from a double defect. They catalyzed the production of the poisonous gas cyanogen and caused a very fast and therefore uncontrollable upsurge in the rate of reaction.[89]

Finally, in 1921, Shibata, basing his experiments on the work of Larsen at the U.S. Government Fixed Nitrogen Laboratory, developed a stable iron hydroxide-base catalyst, cheaply manufactured from iron scale, which gave controllable reaction rates without the release of cyanogen. This process was registered under Japanese government patent No. 79899 "A Manufacturing Method for an Ammonia Synthesis Catalyst."[90] Events some nine years later (see pages) were to prove that Shibata had developed a commercially viable catalyst within three years.

Research on the synthesis process and equipment design was headed by Yokoyama Buichi, who was ably assisted by Nakamura Kenjirō.

In 1920, Yokoyama travelled to Europe, but discovered little at first-hand in Germany, due to the very tight secrecy at Badische. He was not allowed to enter the company's newest and biggest plant at Leuna, while at Oppau he was only permitted to view the plant from the top of a high tower. However, he was able to view a pilot plant near Paris embodying the Claude Process technology, due to the good offices of the

Suzuki Shōten which was then negotiating for the process. Yokoyama's reactions are of interest. In 1920, although the Claude Plant was so tiny in scale and faulty in operation that it had discouraged nearly all visiting engineers from further interest, Yokoyama was favourably impressed. When he visited Europe for a second time in 1928, he thought little of ammonia synthesis plants of great scale and considerable sophistication, as he felt that he could do as well himself.[91] This clearly demonstrates the great advance in Yokoyama's knowledge of ammonia synthesis. In the interim he had been largely responsible for the development of the TIES Process.

While Yokoyama was in Europe, equipment for a laboratory-scale experimental project was being amassed. This included a Messerschmidt hydrogen-making machine and water electrolysis equipment, a Newark compressor from the U.S., and a Hydrendt-type air liquidefier and separator.[92] It would appear that most apparatus at this stage was of foreign origin, and the process chosen was a modification of the Haber.

The laboratory project was a success, and the station proceeded to experiment on a scale which was intermediate between that of the laboratory and a small-scale pilot plant. A small synthesis chamber was sited underground to contain possible explosions, while for extra safety the apparatus was operated from a sandbag-protected shed set at some distance from the synthesis chamber. The official history does not record the origin of the equipment used. Again these intermediate scale experiments were successfully concluded.[93]

During 1923, a pilot plant with a capacity of half-a-ton per day of ammonia was completed, and the third stage of experimentation commenced. The catalyst developed by Shibata functioned as planned and the plant worked smoothly. By this year funding seems to have been insufficient, as gas storage facilities which were vital to prolonged experimentation were not improved, although they were totally inadequate and dangerous.[94] Despite the lack of funds, the dedicated technicians continued to experiment until the project was brought to a successful conclusion in 1925. In 1928, SNRS ceased to have a separate identity, as its facilities and staff were absorbed into TIES, becoming the Sixth Division of that organization.[95]

The catalyst and process developed at SNRS were considerable achievements, although they were both based closely on Western models. Even though the full technical resources of the nation were far from mobilized, the technicians at SNRS, without foreign tutelage or considerable observation of foreign plants, had swiftly developed an economically viable process. There are two significant points here. Firstly, the success implies a considerable degree of preparation in high-temperature, high-pressure gas chemistry by the end of World War I. Secondly, it shows with striking clarity the capacity of the Japanese technicians when given an opportunity.

Let us turn from government research to private enterprise and the activity of individuals. Does the activity of firms and individuals also suggest that Japan by the end of World War I had a considerable capacity in ammonia synthesis? The answer must be "yes." Let us

consider some of the evidence.

There were a number of Japanese technicians, well acquainted with the Haber Process, who had no connection with government research. Perhaps the most outstanding was Tamaru Setsurō, a graduate of Tokyo Imperial University, who had been an assistant and friend of Haber while working on ammonia synthesis at Badische prior to World War I. Tamaru had been forced to leave Germany as an enemy alien with the advent of the war, and he was in the U.S. during 1917 investigating the General Chemical Process for ammonia synthesis, in association with Takamine Jōkichi.[96]

A further recipient of German experience was Suzuki Tatsuji, well-known in Yokohama industrial and financial circles, who in 1920 came to head the newly-founded Yokohama Technical College.[97]

In 1912, eight Yokohama financiers led by Nakamura Fusajirō, head of the Yokohama Watanabe Bank, founded the Yokohama Group. The aim of the group was to promote the industrialization of Yokohama in order to diversify the city's economy, which was excessively dependent on the silk trade. Interested in nitrogen fixation, in March 1913 the group despatched Suzuki and Imazu Akira of TIES to investigate the French Serpek Process. This process was totally unrelated to the catalytic synthesis of ammonia and never became commercially viable. While in Europe, Suzuki took an option on the Japanese rights to the Serpek Process, but gradually became impressed by the superiority of the Haber Process. He attended Haber's well-known lecture on ammonia synthesis in Berlin in 1913, and through Haber's assistant and friend Tamaru

obtained an interview with Haber himself.

Suzuki must have acquired a considerable knowledge of the Haber Process during his eight month sojourn in Europe. Tamaru, with whom he seems to have been on good terms, was almost certainly an invaluable source of information. At an early stage Suzuki renewed acquaintance with his former teacher, Professor Bodenstein of Hanover University of Engineering, who had become an expert on ammonia synthesis. While Imazu continued negotiations on the Serpek Process in Paris, Suzuki studied ammonia synthesis at Hanover University with Bodenstein and two other German researchers.[98] At the time of the "crash" project at SNRS he seems to have been occasionally consulted, but he must have been able to contribute far more than the knowledge of an elementary technique for the joining of high-pressure gas pipes, which is all that is attributed to him in the official history of TIES.[99]

In 1915, the Yokohama Group established a research station to investigate ammonia synthesis and rayon production technology. The work on ammonia synthesis was based on the information Suzuki had obtained in Europe. Suzuki directed research, but an important role was also played by Tōyama Tamotsu, a former professor at Meiji College. Tōyama was despatched to Europe in 1918, and in the following year he too unsuccessfully negotiated for the Japanese rights to the Haber Process. The Yokohama Group, on joining the Oriental Nitrogen Union in 1920 (see page) abandoned research on ammonia synthesis. Later in the year the group was hard-hit by the bankruptcy of Nakamura, though it continued to exist until 1929. There is no record of its accomplishments

in the twenties.[100]

The Ammonium Sulphate Research Group was founded in 1912 by a group of financiers led by Shibusawa Eiichi and Asano Sōichirō to investigate the Serpek Process. Tanaka Eihachirō of Japan Artificial Fertilizers, who managed the group's activities, sent the celebrated applied chemist, Takamine Jōkichi, and Asano's Chief Engineer, Kondō Kaijirō, to France in 1913 to examine the process. Takamine purchased the Far Eastern rights to the process, but soon became far more interested in the Haber Process. After a period of keen competition for the rights to the Haber Process between Takamine and Suzuki, the two agreed to acquire the rights jointly. While the Yokohama Group accepted the arrangement, the Ammonium Sulphate Research Group did not.[101] Little is known about the agreement, but in view of the extremely tight secrecy maintained by Badische, it is highly unlikely that the two organizations came into possession of any of the patents relating to the Haber Process.

During 1917, Takamine Jōkichi, Tamaru Setsurō and Shiohara Matasaku investigated the General Chemical Process for ammonia synthesis in the U.S. Takamine knew William H. Nicols, the President of the General Chemical Company, and some of the staff, making liaison easy. The General Chemical Process, then at an early stage of development, appeared to be better than the Haber, as it operated at a lower pressure and the minimum scale of profitable operation was smaller. They interested the Oriental Nitrogen Union (see page) in the process, but when it was investigated by the Union at a later stage of development in 1918 the experimental plant was found to be very small in scale and faulty in

operation. However, Takamine and Tamaru must have gained a considerable amount of information from their fairly close examination of the experimental plant.[102]

During World War I, Watanabe Katsusaburō, Head of the Watanabe and Akaji Savings Banks, founded the Watanabe Chemical Research Station to research ammonia synthesis. The station was located in Tokyo and was headed by Ishisaka Gōjirō, a graduate of Göttingen University, who had specialized in synthetic dye manufacturing technology. During a second period of study in Germany, he investigated various types of chemical machinery in depth. During the early twenties, Ishisaka had a technical staff of five or six, together with thirty non-technical assistants. Besides being responsible for the overall direction of the project, he developed the hydrogen equipment and compressors, using German models. The experimental plant, which utilized a converted gun barrel for a synthesis chamber, operated on a scale of fifty kilograms ammonia per day.[103]

The process being developed by the Watanabe Station never reached completion. In 1924 it was taken over by Japan Artificial Fertilizers, which continued experimentation for the purpose of gaining experience with ammonia synthesis prior to the importation of the Fauser Process in 1925.[104] The Fauser technology was embodied in a plant which came on stream in 1928. The value attached to the Watanabe Station by Japan Artificial Fertilizers indicates a considerable level of achievement in high-pressure, high-temperature gas synthesis by Ishisaka and his colleagues by the mid-twenties.

Earlier in the twenties, a number of Japanese chemical technologists had a considerable grasp of ammonia synthesis technology. Though their level was not such that they could develop entirely new processes like their European counterparts, it was sufficient to allow the growth of a sizable ammonia synthesis industry. If Japanese industrialists lacked confidence, as they certainly seemed to, in the process developed by SNRS at TIES, then several foreign processes were to become readily available at reasonable prices during the twenties.

The Japanese had found foreign technology almost impossible to obtain in the period prior to World War I. Companies or syndicates had been unwilling to sell the foreign rights of their patents and had maintained tight secrecy in the conduct of their operations. After the war, at least in the ammonia synthesis and rayon industries, conditions were entirely different.

During the twenties, while the rights to the pioneer ammonia synthesis patent, the Haber, were with one exception (see page) never sold or leased in any area of the world, several entirely new processes were perfected in the West which broke the Haber monopoly of ammonia synthesis technology. The inventors made no attempt to form a joint bargaining group with would-be purchasers of their patent. They must have felt that, even had they moved to set up such a group, it would have soon been threatened by yet further invention. In fact, the inventors competed vigorously in the sale of their patent rights. The underlying causes of the competitive situation were the greatly increased emphasis on research and development initiated by the war and the nature of ammonia synthesis itself, which

allowed the invention of clearly distinct, patentable processes.

How soon was this new Western ammonia synthesis technology available? The French Claude and the Italian Casale Processes were functional on a pilot plant scale by 1920.[105] The Claude, which utilized enormous pressures and high temperatures, was never very extensively used, but the Casale was widely adopted. The Fauser Process, also Italian, appears to have been used on a sixty-ton-per-day scale as early as 1924 and must have been developed to a pilot plant scale well before this.[106]

The dates by which the Nitrogen Engineering Corporation (NEC) Process and the Mont Cenis (or Ude) Process were developed are not nearly so certain. The NEC Process was initially developed by the General Chemical Company, but brought to a commercially viable stage by the Nitrogen Engineering Corporation. It was embodied in a full-scale plant constructed during 1926 and, therefore, the technology must have been developed on a pilot scale by 1925 or even earlier.[107] The Mont Cenis Plant was operating on a full industrial scale in Germany by 1928-1929,[108] and the technology must have been developed during or prior to 1927.

Thus, in the first half of the 1920's, four foreign processes were available to the Japanese, and two of these had been developed as early as 1920. By 1930, all of the above five processes had been imported into Japan, and by 1933 even the Haber Process had been transferred.

The prices at which the technology was offered were also far from prohibitive. Noguchi Jun, for example, purchased the Japanese rights to the Casale Process for one million yen in 1921. This was a relatively small fraction of the value of the ammonia synthesis plants at Minamata and Nobeoka, which five years later had a combined value of just under eight million yen.[109]

The foreign processes, when embodied in Japanese plants, were certainly commercially viable. Noguchi Jun started to double the capacity of his first plant at Nobeoka almost immediately and soon moved to set up a much larger factory at Minamata. The profitability of Japan Artificial Fertilizers also improved markedly during the mid-twenties as its ammonia synthesis plant came on stream.[110] Thus, given demand for ammonium sulphate, the opportunity for considerable profit certainly existed in the ammonia synthesis industry in the 1920's.

Throughout the decade there was plenty of margin in the Japanese ammonium sulphate market for additional domestic producers. Between 1920 and 1930 domestic demand for ammonium sulphate approximately tripled, with imports rising from 72,413 short tons to 302,905 short tons in the same period[111] (Table XVI).

A great opportunity existed throughout the twenties in the Japanese ammonia synthesis industry for those who chose to seize it. The level of knowledge of chemistry and chemical technology in general was fairly high, while chemists and chemical technologists were available in abundance. Sufficient specific technical capacity existed in the field of high-pressure, high-temperature gas chemistry that plant could

TABLE XVI

JAPAN PROPER: AMMONIUM SULPHATE
PRODUCTION, IMPORTS AND EXPORTS

Year	Production	Imports	Domestic demand	Exports
1918	52,800	1,088	?	?
1919	78,975	101,213	?	?
1920	80,100	72,413	?	?
1921	94,763	79,238	?	?
1922	92,963	93,038	?	?
1923	104,213	145,725	240,338	?
1924	108,713	168,397	254,250	523
1925	131,138	203,550	303,713	452
1926	147,000	296,025	399,545	4,202
1927	176,475	250,014	385,243	774
1928	232,425	284,475	456,548	2,431
1929	234,609	380,658	519,921	1,858
1930	265,826	302,905	488,000	14,924
1931	393,237	224,148	617,642	26,485
1932	459,663	118,735	618,125	17,956

NOTE: All figures are in short tons.

be operated by Japanese personnel alone and, even in the beginning of the decade, a variant of a foreign process could be developed without foreign tutelage. Foreign ammonia synthesis processes which allowed highly profitable operations to be established in Japan were readily available, and a favourable market existed for new domestic production, as demand was rapidly increasing. The domestic producer had a considerable advantage over his European competitor, as he was accorded the general tariff as well as benefiting from the natural tariff of transport costs.

The great opportunity in ammonia synthesis was parallelled by one of almost equal magnitude in another new branch of the chemical industry--rayon.

The Opportunity in Rayon

The process for viscose rayon was invented by Cross and Bevan in the U.K. during 1891 and patented by them in 1892. Rayon was originally designed to serve as a filament for electric lamps, but metallic filaments soon proved much superior. Rayon soon started to come into use as a textile and was produced on some scale by the end of the century. Between 1898 and 1902 Stan and Topham in the U.K. developed an integrated process, covering all stages from the preparation of viscose to the final stages of spinning. This process was covered by a large number of patents.[112] The viscose process remained the only major method for the manufacture of rayon until the development of the Bemburg cupra-ammonium process in 1919.

In the very early years of the century, the basic patents soon

came to be held by the Viscose Spinning Syndicate, comprised of the companies of the First Rayon Cartel. These were Courtaulds of the U.K., CTA of France and Vereinigte Glanzstoff-Fabriken AG of Germany. Within the cartel, technical information circulated freely, but a policy of total secrecy toward outsiders was maintained. The cartel slowly expanded; Courtaulds set up a U.S. subsidiary, Avisco, in 1910, while the continental companies later developed subsidiaries in Europe.[113] During World War I there seems to have been some leakage of information, as National Rayon--which appears to have had no connection with the cartel--was in the process of building a viscose rayon plant in 1918.[114]

In the introduction of rayon production technology to Japan, the state universities and research stations contributed much less than in the importation of ammonia synthesis.

The earliest research in rayon in Japan, however, was conducted at the university. In 1902, Terano Kanji at the Tokyo Imperial University submitted a graduating essay on viscose, though his treatment was highly theoretical and of little value as a guide to industrial technology.[115] A more industrially-oriented approach was adopted by Iino Tomoji, an assistant professor in the Department of Dyeing and Weaving at the Tokyo Technical College. He commenced research on the cupra-ammonium process in 1907 and the promise of his work was such that he was the first to receive financial assistance for rayon research from the Ministry of Agriculture and Commerce. By 1913, he had progressed to the point where he could produce a thread-like substance, but he discontinued research in that year to study in Europe. On return to

Japan, he took a new post at the Kiryū College of Dyeing, where the head was opposed to research on the cupra-ammonium method, as he thought it to lack commercial possibilities.[116]

What was to prove ultimately the most fruitful research was commenced in the state-operated Yonezawa Technical College, although it did not progress far there. This was the work of Hata Itsuzō, which is fully described in a later section (see page). Suffice it to say here that the Suzuki Shōten had an operating plant by the early 1920's, which was founded in part on Hata's researches.

Some contribution to the pool of knowledge on rayon technology may have been made by two academics, Asakita and Maruzawa, who had studied rayon technology when in Germany in 1911. Little is known of their activities. Maruzawa was certainly a person of considerable ability; he became a professor at Kyushu Imperial University and later held a key position as head of the South Manchurian Railway Company's Central Research Laboratory.[117] It may well be that he returned from Germany with a considerable knowledge of viscose preparation on a laboratory scale. It is highly unlikely that he gained considerable access to any industrial information held by the First Rayon Cartel.

The technology of viscose was considerably simpler than that of ammonia synthesis and very much less demanding in special equipment, so that a very small firm, or even an individual, could hope to make some progress in the field. There may have been many individual researchers, but only two are recorded in the literature.

The more successful of these was Nakajima Asajirō who, after graduating from the very minor Matsuzaka Industrial School, entered a small dye company, but soon left in 1911 to conduct his own research on rayon. He chose the cupra-ammonium process, as it was simpler and well-described in the contemporary Japanese literature. By 1914, he had succeeded in manufacturing a type of thread and, in early 1915, actually set up a very small factory with a workforce of six. By late 1915 he was selling yarn, though it was of very poor quality and probably could not have been sold at all, if it had not been for the wartime shortage. The proceeds of his sales could not cover costs and he was forced to sell his patent to the Japan Artificial Thread Limited Partnership of Yokohama. There is no way at the present time to directly assess the technical level that Nakajima attained, but it seems that he had mastered some of the basic technology. Nakajima was certainly able, as he was later highly successful as a chemist and a businessman. He was Chief Technician at the first large-scale cellophane plant established in Japan in 1928 and he played an important part in the founding of Meishō Rayon in 1934.[118]

The only other individual researcher who receives mention is Itō Kotuzō. Itō was awarded a grant of 1,000 yen by the Ministry of Agriculture and Commerce in 1914 to further his research on the cupra-ammonium process.[119]

During World War I and its aftermath, with rising internal demand for rayon and an almost complete absence of foreign competition in the market, a number of small speculative ventures appeared to exploit the

opportunity.

By far the most noteworthy was the Asahi Artificial Silk Thread Company. In 1918, Itō Chōhei and others of the Eshū Zaibatsu founded a small research establishment and appointed Asahi Nakōjō as head. Asahi had graduated from the Department of Applied Chemistry at Tokyo Imperial University in 1906, and had studied in Germany during 1911. On return to Japan, he researched rayon technology, and took up teaching and research positions, firstly at the Ueda Silk College and later at the Osaka Technical College. Some progress was made in the research, but a year later the Eshū Zaibatsu established Asahi Artificial Silk Thread to develop a French viscose process. Asahi became Chief Engineer.[120]

While the firm soon encountered acute financial difficulties due to the onset of the postwar slump in 1920, it is probable that the company made considerable progress with the viscose technology, though it did not reach the stage of commercial production. In the period 1920-1921 Asahi Artificial Silk Thread became associated with Noguchi Jun. It is probable that Noguchi valued the firm for its pool of technological expertise. The entrepreneur had imported a proven viscose process from Vereinigte Glanzstoff-Fabriken AG, and the company proceeded to build a plant using this technology. In 1922 Asahi Artificial Silk Thread was dissolved and the highly successful Asahi Silk Weaving was established.[121]

The other ventures in rayon were less remarkable, but some of the better-known are noted below. Artificial Silk Thread Industries, a viscose rayon producer, was founded in 1921 with a capitalization of only

250,000 yen. Few details are available. It is known that the rate of production was low (only 50-100 pounds per day compared to more than 800 pounds per day for the Hiroshima Plant of Imperial Rayon in November 1924), but the firm must have been a technological success to some degree, as it did not become bankrupt until 1923 at the earliest.[122] Japan Artificial Thread Limited Partnership was founded in 1916 by Itō Heijirō to utilize the patent of Nakajima Asajirō. Production of low quality thread never exceeded 100 pounds per day. The company appears to have been reorganized in 1917 with a subscribed capital of 750,000 yen. A new plant, utilizing the cupra-ammonium process with a scheduled output of between 100 and 250 pounds per day was planned in Kanagawa Prefecture, but probably never achieved production.[123] The move to establish a large-scale plant indicates that the initial operation was a technological success, at least to the extent that it could produce the low-grade rayon thread salable during wartime.

A few very small firms attempted to establish plants. The Oka Unlimited Partnership set up a cupra-ammonium plant with a planned output of 100-250 pounds per day, but it never achieved production. The Imperial Artificial Silk Thread Limited Partnership was established in Kyoto in 1919 with a capitalization of a mere 24,000 yen. The company appears to have researched viscose rayon for a time, but never actually manufactured thread.[124] While these companies may have added something to the pool of technical knowledge on rayon manufacture in Japan, it is unlikely that their operations were technological successes.

Government experimental stations did not contribute to the pool of technical knowledge on rayon manufacturing in Japan during the critical early development of the industry. The rayon industry was fully established by 1924, yet TIES published nothing relating to the industry until 1926, when Ozawa reported the results of his experiments on the manufacture of a pulp suitable for Japanese paper-making and viscose. No further research results relating to viscose manufacture were published until the reports of Okada and Hayakawa in 1929.[125] The object of nearly all research on rayon at TIES during the twenties and thirties was to discover domestic substitutes for imported pulp in order to conserve scarce foreign exchange. The station conducted no request work on artificial textiles whatsoever until 1939.

By the early 1920's, there was a considerable pool of technical knowledge in Japan concerning both the viscose and the cupra-ammonium processes for rayon manufacture. Suzuki's Hiroshima Plant, which was to produce rayon by the viscose process in considerable quantity at competitive prices, was under construction by 1920 (see page). There was no foreign tutelage. The technology embodied there was derived from three sources: experimentation within Japan based on foreign written materials; industrial spying abroad; and direct copying of European hardware in Japan. Asahi Artificial Silk Thread's spinning technology was sufficiently advanced to make the firm valuable to Noguchi in the establishment of a viscose rayon process. Two other companies, though less remarkable than Suzuki or even Asahi, seem to have attained a degree of knowledge of rayon production technology, as

they produced salable thread on a commercial scale for significant periods. There are indications that a number of others may have had a degree of knowledge of rayon production processes.

It is probable that, even without the import of specific foreign processes in the twenties, Japan had sufficient technical capacity to support several full-scale ventures in rayon manufacture. Given the ready availability of specific foreign processes, Japan certainly could have mounted such operations.

Was this foreign technology available? The answer is a definite and unqualified "yes."

We have already noted that, prior to World War I, under the First Rayon Cartel, there was little leakage of technical knowledge concerning viscose rayon manufacture. During the war tight secrecy could no longer be maintained, and after the war rayon manufacturing technology became available at rock-bottom prices. Why was this? First and least important was the development of the Bemburg cupra-ammonium process to a commercially competitive stage in 1919,[126] which broke the monopoly of the First Rayon Cartel. Second, many of the basic patents of the process developed by Stan and Topham had lapsed by 1920.[127] Third, by this date a fairly large number of firms were using the patents, which made strict secrecy difficult in any case. Fourth and perhaps most important, was the pitiful eagerness of German engineering companies to sell equipment to any potential purchaser. After World War I, in common with the rest of the German economy, the engineering industry was acutely depressed and firms were willing to sell formerly highly-secret machinery, even

in small quantities for ridiculously low prices, just to keep themselves solvent for a few more weeks or months.

In 1918 the pioneer Suzuki was forced to resort to a feat of industrial espionage abroad in order to continue development of its Hiroshima Plant (see page). By 1921 several first-line German manufacturers were offering to sell viscose rayon spinning equipment to Suzuki and all other comers at bargain-basement prices. From this time on, foreign rayon technology was imported freely by the Japanese, until demand for it ceased with the advent of the war economy in 1937. All firms moving into rayon after Suzuki relied exclusively on foreign technology and no company encountered difficulty in obtaining that technology.

Consumption of rayon in Japan rose swiftly in the twenties. In 1920 the value of consumption was a mere 1,239,000 yen; by 1924 it had leapt up to 7,808,000 yen; and in 1927 it reached 27,227,000 yen. By 1930 consumption had nearly doubled again in value to 50,628,000 yen.[128] There was thus no lack of market for an enterprising company during the decade.

Japanese companies were competitive on the domestic market in rayon from the early twenties. This is well shown by the expansion of plant by the first Japanese rayon producer, Imperial Rayon. The company's Hiroshima Plant was not in full operation until 1922, but as early as February 1925 the firm decided to build a much larger plant at Iwakuni. The operations of Noguchi Jun were also rapidly expanded. The first plant, that of Asahi Silk Weaving (the successor company to Asahi Artificial Silk Thread) came on stream in 1924 and, as early as 1926, a further and larger plant was under construction at Nobeoka.[129]

By the very early twenties, Japan had more than sufficient technical capacity in rayon technology to operate the foreign processes already available on reasonable terms. Internal consumption of rayon expanded rapidly, and initial domestic investments proved extremely profitable. At any time after 1920, a profitable rayon venture could have been mounted in Japan.

VI. THE GREAT ZAIBATSU IN THE CHEMICAL INDUSTRY

Mitsubishi had no chemical manufacturing arm of any kind until 1934 when Japan Tar Industries was established. Neither did the zaibatsu have any considerable interest in the chemical industry through associated companies in the twenties. As we will show (see page), Japan Nitrogenous Fertilizers was independent of Mitsubishi after 1921 and the zaibatsu's only connection with the industry was through the soda manufacturer Asahi Glass, which had been established in 1907 by Iwasaki Toshiya, a cousin of the founder of Mitsubishi.[130]

While it may be claimed that Mitsubishi was unlikely to have developed a chemical arm as it was centred on the unrelated heavy engineering industries, the firm had in fact diversified into fields as remote from engineering as warehousing and finance by the immediate post-World War I period. In addition, Mitsubishi did have some links with the chemical industry which, under an aggressive management, might have led to the establishment of a chemical manufacturing division. The combine, which handled a considerable volume of chemical fertilizers and was involved in coal mining on some scale, could well have developed

chemical fertilizer and synthetic dye manufacture. Yet it did not. We will consider the reasons for Mitsubishi's tardy entry into the chemical industry in some detail later.

While Mitsui was active in the chemical industry during the twenties, it moved tardily and timidly in the newer and more technologically complex sectors, considering the vast resources of the combine. It is not surprising that Mitsui took a greater interest in chemicals than Mitsubishi. The great combine was not only extremely diversified, but its industrial centre lay in the complex based on coal at Miike in Kyushu. One logical line of development of this complex was chemical manufacture, and it was here that the combine commenced the production of simple synthetic dyes on a small scale in 1912. In the same year, as part of a general policy of diversification, Mitsui established the predecessor of Electro-chemical Industries, which developed calcium carbide, calcium cyanamide and transformed ammonia manufacture.[131] By the end of World War I, Mitsui, together with several other firms, had established a soda manufacturing arm. Apart from synthetic dyes, Mitsui did not pioneer in any of these fields, being anticipated by Noguchi in carbide, cyanamide and transformed ammonia, and by Nakano Yūrei, Iwasaki Toshiya and others in soda. Mitsui's achievements in synthetic dyes were also limited, as in common with other contemporary Japanese producers the range of products was long confined to the simplest dyes, and even these could only be manufactured behind a high tariff wall. The scale of Mitsui's enterprises, too, was not great considering the size of the zaibatsu. To appreciate the timidity of Mitsui, however, we must consider its record

in rayon and ammonia synthesis.

The Great Zaibatsu in Rayon

Mitsubishi was not involved in any way in the manufacture of rayon prior to World War II. Some might argue that Mitsubishi had an interest in the rayon industry through Japan Nitrogenous Fertilizers and Fuji Gas Spinning. To be sure, Japan Nitrogenous Fertilizers did hold a controlling interest in Asahi Silk Weaving, one of the pioneers in Japanese rayon, but the chemical producer was independent of Mitsubishi in the twenties. Fuji Gas Spinning entered the rayon industry in the mid-thirties, but, contrary to some contemporary opinion, there is no evidence that the firm was controlled by Mitsubishi, or even that there was a strong link of any kind between the two companies (see page 155).

Unlike Mitsubishi, Mitsui did develop a rayon arm in the twenties, but the Great Zaibatsu was tardy and timid in its approach. The history of the development of Mitsui's rayon enterprise, Oriental Rayon, while displaying the sluggishness of Mitsui's top management, also demonstrated the capability of the firm's technicians and their ready response to opportunity.

In 1919, one of the principal companies of the Mitsui Zaibatsu, Mitsui Bussan, contracted to sell the rayon thread of the major British producer, Samuel Courtauld & Co. Ltd. In the very early twenties, the Managing Director of Mitsui Bussan, the formidable Yasukawa Yūnosuke, noting the strong domestic demand for rayon, became interested in establishing a plant in Japan and solicited the support of the top

management.

Yasukawa was opposed from the outset by the Chairman of the Board of Directors of the Mitsui Gōmei, Dan Takuma, who was by far the most influential person in the combine.[132] In early 1923, he absolutely rejected a formal proposition by Yasukawa that a rayon plant be established. Dan's statement of refusal throws considerable light on the attitudes of Mitsui's top management. He said: "Although it is a splendid idea to found a company to produce rayon, it is not wise to proceed until we are completely sure of ourselves, as this is a new chemical industry. It would be better to postpone the project for a time."[133] (Present author's emphasis.) Dan displays here a lack of confidence in Japanese chemical technology, and one also senses in his words a fear of ridicule if the venture were to fail.

Dan undoubtedly displayed excessive caution. As we have seen, by 1920, conditions for the establishment of a rayon enterprise were very favourable. The pioneers had already proved that rayon manufacture could be a success in Japan. By the end of 1922, the plant of Suzuki's subsidiary, Imperial Rayon, which had been developed without any direct foreign technical participation, had already proved itself in full operation and, in 1923, the firm paid excellent dividends. In 1923, too, Noguchi was already constructing the plant of Asahi Silk Weaving, and trial production was to be attained as early as May 1924.[134]

While Dan at first vetoed the establishment of a plant, he did not stop exploratory work, as Yasukawa was able to order research into rayon technology and two directors of Mitsui Bussan were sent to study

the Topham Spinning Process in the West.[135]

Yasukawa decided that to cooperate with an existing producer would be better than to attempt independent development. In this he was probably strongly influenced by the cautious attitude of Dan Takuma. Dan had been persuaded to permit the venture to proceed by November, 1923, as at that time Yasukawa approached Courtaulds with a proposal that they supply technology for a predominantly Mitsui-owned rayon plant in Japan. As an incentive, he stated that a heavy tariff was likely to be applied in the near future to rayon imports. Courtaulds, aware that Mitsui was highly influential in Japanese politics, may well have been swayed by this veiled threat. It is of interest to note that a considerably increased tariff was in fact applied very soon after the establishment of Oriental Rayon.[136]

In May 1925 Mitsui Bussan reached final agreement with Courtaulds under the following terms:[137]

1. Courtaulds was not to establish an independent plant in Japan.

2. Mitsui was to develop the Japanese market.

3. A new company was to be set up, equipment imported, and technicians hired.

In August 1925 the directors of Mitsui Bussan decided that the rayon venture should be established as a separate enterprise under the name Oriental Rayon, though this firm was to be under the control of Mitsui Bussan. This separation and a name which did not include the word "Mitsui" were undoubtedly at the order of Dan Takuma, who at this juncture stressed that on no account were "industrial adventures" to be

conducted in the name of Mitsui.[138] Again, Dan displayed almost unbelievable over-caution.

At this period there is yet further evidence of Dan's excessive caution. According to the advice of the European technicians, the minimum profitable operating scale of a viscose rayon plant at this time was about six tons viscose per day, but Mitsui decided to scale down the plant to an initial output of three tons per day. While the official company history attributes this decision to Yasukawa,[139] it is totally out of character for him and was very probably taken by Dan himself. Dan is recorded as stating at this time that he was opposed to the factory plan drawn up by the Europeans, as there was too great a degree of concentration of labour and capital in one unit.[140]

The preparations proceeded for the establishment of the plant. In late 1925 Mitsui Bussan decided on the purchase of Topham spinning equipment from Oscar Kohorn Limited,[141] but also determined to manufacture some of the subsidiary equipment in Japan. The drying equipment and the storage tanks, for example, were to be manufactured at Mitsui's Tama Shipyard. While from the beginning Mitsui never wavered in its intent to rely heavily on foreign technical manpower, it was not until late in 1925 that the firm resolved to proceed without the participation of foreign capital and management. The lateness of this decision affords evidence of a lack of confidence in Japanese managerial ability among the Mitsui leadership.

Oriental Rayon was incorporated in January 1926 with a capitalization of ten million yen, of which a quarter was to be subscribed.

Yasukawa was appointed one of the two managing directors.[142]

The plant, located in Shiga Prefecture, was built almost entirely by European technicians. At first, construction was under the overall supervision of the Chief Engineer, Antonio Minelli, who was Chief Engineer and Vice-Managing Director of Societa Generale Italiano Della Viscosa. However, Minelli committed suicide in February 1927 and his place as chief engineer was taken by an Englishman, J. R. Starley.[143] Fully forty highly-skilled foreigners were employed, all of whom with the exception of five Germans were British. Most were permanent employees of Courtaulds or Oscar Kohorn on loan to the Japanese company. It is very probable that most of the foreign technicians had left by early 1928 when the plant was brought to full-scale operation, but Starley and a leading technician, Arden, did not leave until October 1931.[144] Japanese technicians did play some part in the installation of the equipment and also effected improvements in the effluent system.[145]

The plant started up in August 1927 in an atmosphere of some excitement among the Japanese, though the foreigners had an air of calm confidence. After the first months of operation in which there were many breakdowns, operation proceeded smoothly.[146]

The technological development of Oriental Rayon completely vindicated the confidence of Yasukawa and made nonsense of the excessive timidity of Dan Takuma.

Consider first the rapid rise in the capacity of the operating technicians at Oriental Rayon itself. From the start of the construction of the Number One Plant they enthusiastically assimilated Courtaulds'

technology, while at the same time displaying a talent for cost-saving innovation. They held study meetings at the plant to exchange knowledge and also visited other rayon plants in Japan.[147] Three lines of evidence indicate the rapid rise of their technical capacity.

Firstly, the withdrawal of nearly all of the European technicians, probably as early as the beginning of 1928 only six months after start-up, suggests that the Japanese swiftly mastered the operation of the installed equipment.

Secondly, after the departure of the two remaining technicians, Starley and Arden, in October 1931, a great number of important alterations were made to the plant. This clearly indicates that the Japanese technicians had obtained a thorough grasp of the production technology in the four years which had elapsed since start-up. The following improvements were effected: the time necessary for viscose production was reduced; the composition of the spinning bath fluid was altered to lower costs; tension was applied to the thread during manufacture to increase its quality; production was increased by speeding up the pot motors and all related equipment; labour costs were reduced by mechanization; savings were effected by economy in steam consumption, the recycling of cleaning water, and the use of cheap substitute chemicals.[148]

Thirdly, by the time of the start of construction of the Number Two Plant in the summer of 1932, the technicians had sufficient grasp of the production technology to design original spinning and treatment equipment. The Number Two Plant incorporated many novel features in the design of individual equipment and of overall layout, representing

the fruits of the operating experience gained at the Number One Plant.[149]

The Japanese machine-building industry responded well to the demands of Oriental Rayon. While nearly all the initial equipment installed at the Number One Plant was foreign, each successive expansion of the plant during and after 1927 utilized a greater proportion of Japanese equipment. In 1928 the firm conducted trials of the machinery of several Japanese manufacturers and Toyota-Type Looms was selected as principal supplier.[150] The pot motors were especially difficult to manufacture and those in use had been made by the top-line firm Siemens. Shibaura Engineering, however, developed a satisfactory product and was made sole supplier to Oriental Rayon. Additional equipment was also made up at the Toba Plant of Kobe Engineering.[151] By June 1929 the Number One Plant had forty-eight machines in operation and a daily production of 15.7 tons of viscose, which was five times the initial level.[152]

Thus by 1928-1929 the Japanese textile machinery and electrical equipment industries had proved their capacity to manufacture almost all of the complex chemical and spinning equipment required for rayon production. This stands in sharp contrast to the generally poor quality of their products in the first two years of the decade, when Imperial Rayon had placed the first orders for spinning equipment.[153] However, there were limits to Japanese textile equipment manufacturing capacity even in the late twenties, and the vital and intricate spinning pumps for the expansion at the Number One Plant were imported from Italy. U.S. models were later used, and it was only after some years had

elapsed that a Japanese product came into use.

Japanese equipment was preferred to foreign, because it was much cheaper. Some examples will make the extent of the price differential clear. Godet wheels were at first imported for 30 yen apiece, but later supplied by Japanese manufacturers for 12 sen each. Japanese-made spinning pots of comparable quality to the foreign product were sold for only one-twentieth of the cost of the import.[154]

So great was the rise in Japanese technical capacity that, by 1935, the technicians could at times even improve on imported European equipment. When Oriental Rayon entered the field of rayon staple manufacture, one spinning machine for staple was purchased from Germany as a model, but the cutter on this machine was soon corroded by acid, rendering it unusable. The technicians, however, improved the design of the machine, which then functioned satisfactorily.[155]

Oriental Rayon was a successful company, but prior to World War II, it never achieved the prominence which one would expect of Mitsui's rayon arm. By the second half of 1934, the firm ranked only fourth among the six major Japanese rayon producers, in both thread production and gross profit (see Table XXVI, page). The company had a monthly rayon production of only 250,000 pounds in 1934, compared to 600,000 pounds for Asahi Bemburg, and 1,300,000 pounds for the Suzuki subsidiary, Imperial Rayon. Had Dan Takuma not been so excessively timid, given the high level of dedication and skill which the technicians demonstrated, the firm could easily have occupied a much higher place among the artificial fibre producers.

The Great Zaibatsu in Synthetic Ammonia

During World War I, the Japanese government took advantage of Germany's enemy status to appropriate the Japanese rights to the Haber patent for ammonia synthesis. The government then sold these rights to the Navy, which did nothing to develop an ammonia synthesis plant, however, as it lacked the technical capacity.[156]

In 1918 a group of organizations and individuals was formed to research ammonia synthesis,[157] and shortly after took the name of the Oriental Nitrogen Union (ONU). The participants included Sumitomo, Mitsui and Mitsubishi--the prime movers, together with Japan Artificial Fertilizers, Sankyō, Japan Chemical, the Yokohama Group, and an individual--Shuzui Shingo.[158] The Great Zaibatsu had displayed some interest in ammonia synthesis from early in the war period and, ironically, their representatives in the ONU included two men who were later to display a striking lack of enthusiasm for the industrialization of ammonia synthesis technology. They were Dan Takuma of Mitsui and Kimura Kusuyata of Mitsubishi.[159]

The Japanese rights to the Haber Process had been relinquished by the Navy, and the government continued to hold them as part of German reparations payments after the war. The ONU purchased the rights, but lacked the capacity to industrialize the process from theoretical information alone, and thus looked abroad for other processes it could purchase in the form of existing hardware of proven value.

There can be no doubt that, at this early period, the ONU was serious in its intent, as it paid fully 600,000 yen (approximately

$300,000 U.S.) for an examination of the General Chemical Company's crude experimental plant located at Laurel Hill in New York State.[160] The General Chemical Company, formed in 1899 by the merger of twelve small American firms, was a large chemical producer of a high level of technical competence, which had commenced research on ammonia synthesis as early as 1913.[161] However, the plant functioned badly and the examination proved of little value. The ONU technicians also visited France and Germany, but made no purchase of process or equipment.[162]

After 1920, the formerly enthusiastic ONU discontinued investigatory work. Why was this? Okumura Masao puts forward the idea that all participants were greatly discouraged by the information gained in Germany that a modern plant would have to be on a scale of 200,000 tons production per year with a capital cost of seventy million yen--an unthinkably large expenditure during the postwar slump.[163] This explanation is unconvincing. The Nobeoka Plant of Japan Nitrogenous Fertilizers, which came on stream in October 1923, had an initial capacity of only 12,500 tons ammonium sulphate per year and a capital cost of only a small fraction of seventy million yen. This plant was in the planning stage only a little over a year after the ONU abandoned its search. Another source[164] indicates other reasons for the abandonment of the investigation. One reason offered was that Mitsui Bussan and Mitsubishi Shōji feared diminished sales and profits as their import trade would be greatly reduced, and they thus pressured the ONU to abandon the project. This is also unconvincing, as among the ONU members Mitsui and Mitsubishi had by far the strongest domestic sales

networks, and would have come to market nearly all of the union's output. A second reason is suggested by a statement of Suzuki Masaya, the Chairman of the Sumitomo Board, who was the only company leader to express reasons for the termination of the search for a process. Suzuki, while urging that the industrialization of ammonia synthesis should be carried out as a work of national importance, said that Sumitomo could not bear the cost.[165] As Sumitomo had vastly greater resources than Japan Nitrogenous Fertilizers, which did establish an ammonia synthesis plant, Suzuki clearly implied risk as the real reason for not proceeding.

It would thus seem that at least one explanation for the ONU's sudden decline of enthusiasm was a growing realization of the risks involved. A further possible explanation is that it was due to technological containment by the West. Such was the importance of ammonia synthesis in the development strategy of the chemical industry and so to a nation's war-making capacity, that certain Western nations may have sought to contain Japan in this area by exerting economic pressure on the Great Zaibatsu. This technological containment policy, if in fact it existed, was the economic parallel to the policy of military containment effected by the treaties concluded at the Washington Conference in 1921-1922. (For a more detailed discussion of possible containment of this type, see page .)

During the twenties, far from constituting the spearhead of Japanese technological advance in the chemical industry, the ONU was fashioned into a private "tariff" collection agency. It was reorganized in 1924 and came to receive a royalty of one-and-a-half per cent of the

price of imported German ammonium sulphate, which was mostly produced by the Haber Process. The Germans appear to have agreed to the royalty as an alternative to litigation which could have been long, costly and ultimately unsuccessful. The ONU, as possessors of the Japanese rights to the Haber, could well have argued that German ammonium sulphate produced by the Haber should be excluded from Japan. In December 1926 the ONU was legally incorporated as Oriental Nitrogen Industries Limited.[166] With the deepening agricultural crisis of the late twenties, Oriental Nitrogen Industries came under great pressure to abolish the royalty, and the Fertilizer Administration Bill presented in the 56th Imperial Diet in 1929 contained a clause terminating the royalty. Though this measure failed to pass, in the face of the angry revolutionary mood of the early thirties Oriental Nitrogen Industries itself terminated the payments in April 1932.[167] The organization was not wound up until 1948, although after 1932 it pursued a new role. It funded selected research projects and financed an exploration venture in Taiwan which discovered natural gas.[168]

Let us now turn to the record of the Great Zaibatsu themselves in ammonia synthesis.

Mitsubishi was very slow to industrialize ammonia synthesis technology. As we have noted, the combine had no chemical branch whatsoever until 1934, and it was only in 1937 that a plant (80,000 tons per year capacity in ammonium sulphate) commenced operations at Kurosaki in Fukuoka Prefecture, Kyushu.[169] This plant was the thirteenth to be constructed in Japan and came on stream a full fourteen years later than

the pioneering venture of Japan Nitrogenous Fertilizers at Nobeoka. It was only in the security of the boom period in ammonium sulphate sales which commenced in 1935 that Mitsubishi entered the industry.

An excellent indication of the sluggishness of Mitsubishi is the character of the company's contemporaries in the industrialization of ammonia synthesis. These companies were Niigata Sulphuric Acid and Taki Fertilizer Plant. Niigata's 10,000-ton-per-year ammonium sulphate plant came on stream in April 1937, while Taki started up a 50,000-ton-per-year plant in April 1938. Niigata and Taki were both small companies, which had previously been mainly engaged in the technologically simple manufacture of calcium superphosphate.[170]

Mitsui, while more active than Mitsubishi, was still very sluggish. Although by the immediate post-World War I period the transformed ammonia process had clearly been superceded by the synthesis process which offered much lower costs, Mitsui continued to manufacture ammonium sulphate by the older process throughout the twenties through its subsidiary Electro-chemical Industries. Mitsui made little effort to establish an ammonia synthesis plant until very late in the decade, although Makita Tamaki, secretary and effective head of Mitsui Mining, had long been interested in the process.

In striking contrast to the courage shown by Japan Nitrogenous Fertilizers and the Suzuki Shōten, Mitsui's entry to the ammonia synthesis industry was not only tardy but timid. Far from gambling boldly by plunging into the industrialization of a process tested only on a pilot plant scale, the Great Zaibatsu displayed an attitude of ultra-caution.

Although Noguchi had been successful in ammonia synthesis by 1923, Mitsui took no significant steps towards entering the industry until five years later. Though Mitsui had not been a pioneer, it had been a relatively major force in the chemical industry in 1920, but was now clearly falling behind. If the firm intended to retain its position in the industry, it must act and act quickly. Time, it might have seemed, was of the essence. It would have been an easy matter for Mitsui to have experimented aggressively with two processes on some scale in order to speed up the acquisition of technological experience, but the combine did not do this.

Far from experimenting on some scale with two processes, Mitsui moved hesitantly into one. The great combine took over the management of a very small ammonia synthesis plant with established technology for a one-year trial period.

Due to the bankruptcy of the Suzuki Shōten, Mitsui was able to obtain experience with Claude Process technology, by taking over the management of Number One Nitrogen in January 1928. The plant then had a productive capacity of 14,600 tons ammonium sulphate per year.[171] Had Mitsui not been able to gain easy access to the Claude Process, the Great Zaibatsu might well have delayed its entry to the industry for several more years.

Even the ultra-cautious Mitsui was satisfied with the technological performance of Number One Nitrogen's plant and, in January 1929, the zaibatsu took over the enterprise completely, renaming it Hikoshima Refinery, Nitrogen Plant, Limited Stock Company.[172]

By 1930, Mitsui determined on a policy of expansion, but even this was to afford yet a further example of the firm's over-caution. Although in that year Japan Nitrogenous Fertilizers had synthetic ammonia plant of 400,000 tons per year approaching completion in Korea and Shōwa Fertilizers had plant of 150,000 tons capacity under construction at Kawasaki, the mighty Mitsui planned a plant at Miike in Kyushu with a capacity of only 36,000 tons ammonium sulphate per year. The plant incorporated no fundamental innovation, as it utilized a somewhat modified form of the Claude Process, and used water gas as a source of hydrogen as at Hikoshima.[173]

The plant was completed in April 1931, though full-scale operation did not start until January 1932. The new company, Miike Nitrogen Industries, was formally established in August 1931.[174] Prior to World War II, due to a late start, Mitsui never achieved the dominant position in the Japanese chemical industry, which had lain so easily within its grasp in the early twenties.

VII. THE CAUTIOUS COMPRADORS

Why were the Great Zaibatsu sluggish in the importation of new industrial technology into Japan? We will discuss the question under three general headings; firstly, "mechanical" factors; secondly, factors associated with the phase of development of the combines; and, thirdly, lack of confidence. We have little direct information on the views of the boards of directors of the two giant combines. No records of board meetings are available. In our discussion, we must rely for the most

part on the indirect approach of formulating and testing hypotheses.

"Mechanical" factors comprise managerial structure, and possible causes associated with the sheer size of the Great Zaibatsu. These include the considerable existing diversification of the two combines, their great economic and political power, and a sense of complacency born of a long supremacy. In discussing development phases, we will consider the age of management and the value system of the employee. Lack of confidence in Japanese technological ability appears to have had two entirely different sources: the personal experience of the leadership with Japanese technology and the general sense of inferiority to the West held by virtually all Japanese of the period.

Let us deal with the "mechanical" factors first.

The managerial structure of the Great Zaibatsu was not the cause of their sluggishness, as they had entirely dissimilar managerial systems. For Morikawa Hidemasa, Great Zaibatsu policy was neither the safety-conscious maximization of immediate profit typical of the owner-operator, nor the audacious pursuit of power and adventure characteristic of the manager-operator. He has argued that the Great Zaibatsu were operated by owners and managers working in cooperation, with the consequence that their investment policy was characteristic of neither owner-operated companies nor management-operated companies, but was of an intermediate type which stressed cautious expansion.[175] Morikawa is certainly in error here, as the managerial structure of the two great combines differed radically, and Mitsubishi's structure was far more similar to that of the rising companies than that of Mitsui.

Mitsui was owned by the eleven Mitsui families, but they had played no real part in the management of the combine since the late Tokugawa Period. Mitsui management lay in the hands of professionals.

Let us consider the managerial structure between 1914 and 1932 when Dan Takuma was Chairman of the Board of Directors of Mitsui Gōmei, which controlled all companies in the Mitsui combine.

While a board comprising a number of Mitsui family heads and Dan Takuma met weekly, it received direction from the Gōmei Kaisha Directorate, which was in fact the highest managerial body of the Mitsui Zaibatsu.[176] In the twenties control of Mitsui lay with the following men.[177]

Directors of the Gōmei Kaisha Directorate:

Dan Takuma (Chairman of the Board)

Ariga Chōbun

Fukui Kikusaburō

Sakai Tokutarō

Oshima Masatarō

Advisers to the Gōmei Kaisha Directorate:

Ikeda Seihin (de facto head of Mitsui Bank)

Yoneyama Umekichi (de facto head of Mitsui Trust)

Makita Tamaki (de facto head of Mitsui Mining)

Yasukawa Yūnosuke (de facto head of Mitsui Bussan)

Fujihara Ginjirō (de facto head of Oji Paper)

Isomura Toyotarō (de facto head of Hokkaido Coal & Steamship)

In addition to this official management group, there was also an "extra-constitutional" high-level adviser, whose role was especially important at times of crisis. In the Meiji Period, Inoue Kaoru had held this position, but during and after Dan's ascendancy that role was played by Dan's predecessor in office—Masuda Takashi.

While the Mitsui families did not share in the managerial function, they played a vital role through social activities and marriage alliances in the formation of business and political links.[178] If we were to regard Mitsui as a state, then the Gōmei Kaisha Directorate would be the cabinet with Dan as the prime minister, and the family constitutional royalty.

The managerial structure of Mitsubishi was entirely different. The combine was much newer than Mitsui and, in the twenties, the owners of this relatively new house still possessed sufficient strength, determination and confidence to impose a dictatorial rule on the organization, which was much more tightly knit than the loose rambling empire of Mitsui. The Board of Directors of Mitsubishi was not, as with Mitsui, the decision-making body, but simply an advisory committee to a president with dictatorial powers.[179] Those with direct influence on company policy from late Meiji to the switch of policy in the early thirties were the following family members, who between them held the entire stock of the Mitsubishi Gōshi Kaisha which controlled the combine.[180] The president was always the most able senior male of the Iwasaki family.

Iwasaki Koyata held 30 million yen of stock of a total capitalization of 120 million yen. He succeeded his father Iwasaki Yūnosuke, who was the brother of Iwasaki Yatarō, and was President from 1917 to 1946.

Iwasaki Hisaya held 40 million yen of stock. He was the elder son of Iwasaki Yatarō.

Iwasaki Hikoyata held 50 million yen of stock. He was the elder son of Iwasaki Hisaya.

The following persons were indirectly influential during the twenties in an advisory capacity:[181]

Kimura Kusuyata was appointed a managing director of Mitsubishi Gōshi in 1920 and in 1922 became the Head Managing Director.

Kushida Manzō was appointed Head of the Mitsubishi Bank in 1921 and was very influential as an adviser during the twenties and, to an even greater extent, in the thirties.

Fukuzawa Momosuke was without official connection to Mitsubishi, but was a very close friend of Iwasaki Koyata. He was especially influential in the period following 1931.

The management of the owner-operated Mitsubishi was thus in complete contrast to the professionally managed Mitsui, though both managements showed an equal lack of aggression in the industrialization of risky new technology. Mitsubishi's managerial structure, however, with its autocratic owner-president, strongly resembled that of the rising companies, especially Noguchi's Japan Nitrogenous Fertilizers and Mori's Shōwa Fertilizers.

Let us now turn from management structure and consider the other "mechanical" factors. It cannot be argued that, by the end of World War I, the Great Zaibatsu managements deemed further diversification unnecessary. Mitsui and Mitsubishi did diversify during the twenties,

but into finance-related fields and the older industries. As we have seen, they gave little weight to the risky new industries.

Profit maximization is not usually the first objective of a major company. It may well be that the leaders of the giant combines placed their principal emphasis on the maintenance of their hegemony over the Japanese economy and felt that they could hold their position without risky diversification. Due to their great financial resources and all-pervading political influence, the Great Zaibatsu could suppress potential rivals. In the environment of the twenties, the rising companies could soon be brought to heel as obedient followers of the master and, if necessary, their holdings could be stripped from them. Or so the directors of the Great Zaibatsu may have thought. A consideration of the reaction of the Great Zaibatsu to the challenge offered by the Suzuki Shōten gives support to this interpretation of the outlook of the leadership of the great combines. Although Suzuki had become a major threat by the end of World War I and continued to grow vigorously in the early twenties, neither Mitsui nor Mitsubishi attempted to parallel the performance of the advancing Kobe giant. Instead, as we shall see, Mitsui appears to have taken political action (see page). If the prime emphasis of the great combines was in fact maintenance of the existing hierarchy and if this could be achieved without vigorous expansion, then diversification into new and difficult industries was clearly not of great importance.

It is probable, too, that the long period of Great Zaibatsu economic ascendancy had led to a sense of complacency and to ultra-conservative industrial policies. Certainly, in the area of politics,

there is evidence of a divorce from reality, at least in the early thirties. While the Great Zaibatsu may well have been aware of a conspiracy of important elements in the Army, industry and the bureaucracy by the end of 1930 (see page 448), they appear to have greatly underestimated the magnitude of the rise of revolutionary feeling in the country as a whole in the early thirties. By early 1932, there was a very widespread revolutionary upswing against the Establishment and the Great Zaibatsu which stood at its apex, with much of the countryside, sections of industry, the Army and the Government-General of Korea in direct or indirect rebellion against the Great Zaibatsu. Despite these obvious manifestations of imminent revolution, the leaders of Mitsui and Mitsubishi were stunned by the Blood-Brotherhood Conspiracy and the closely-related May 15th Incident, although these were merely a violent expression of the prevailing public mood.[182] It was only after the violence of the early months of 1932 that the Great Zaibatsu seriously commenced to study the changes in Japanese society and the resultant revolutionary movements.[183] The dawn of Great Zaibatsu awareness came fully one-and-a-half years after the first clear evidence of a strong upswing of anti-establishment opinion and more than one year after Mori Nobuteru had clearly sensed the coming political change. Only a vast complacency could have led the Great Zaibatsu to ignore such clear evidence. So great, in fact, had been their political complacency and consequent unawareness, that it took them no less than two years after May 1932 to form an adequate interpretation of the situation and to design counter-policies to allow their survival in the

New Japan which was emerging so painfully from the death of the old. Prior to 1930, the Great Zaibatsu had been the careless masters of a largely unaware and acquiescent populace, but by 1934 they had become the somewhat unwilling tools of an aroused and angry people. By then, the great complacency was indeed over.

Let us now turn to examine the second category of factors which may have influenced the investment behaviour of the Great Zaibatsu in the new and risky industries. These are factors associated with the phase of development of the combines.

Companies,like empires and other institutions,have a readily discernible life-cycle, comprising the stages of birth, growth, maturity, stagnation, decline and death. Unless externally-forced rejuvenation occurs, as it did with the zaibatsu in the early thirties, these stages follow almost inexorably on one another. In its early stages, a company is founded and developed by its enterprising, energetic and resourceful owners; at a later phase in its history, as the original owners die and their less talented and energetic successors come into possession, the company, now large and apparently secure, becomes less aggressive. The character of the employees, too, changes. In its heroic and precarious early period, the firm attracts able and forceful men keen to exert themselves to further the progress of the company and their own careers. In the later stages, the large and apparently secure company attracts men interested in steady monthly pay and a peaceful, pensioned retirement rather than achievement. There is, thus, a slackening of the work-drive in both management and work-force and conservatism holds sway.

By the twenties, Mitsui and Mitsubishi had both passed beyond their heroic age. In Mitsui, as we have seen, the family had long ceased to be at the helm and the firm was operated by a panel of professional managers, in which no individual was completely dominant. Mitsubishi, though much younger, was under the third generation management of Iwasaki Koyata, who though intelligent[184] appears to have lacked great business ability or considerable work-drive.

At least one writer[185] has claimed that the blindness of the Great Zaibatsu to the dangerous political circumstances of the early thirties was due in part to the advanced age of their managers. Possibly conservatism in industrial policy could be traced to the same source. Was senility or semi-senility of top management an important factor in the sluggishness of the Great Zaibatsu in the new industries? Were the giant combines in the twenties and early thirties controlled by men whose minds had become vague, or were inflexibly set in past and now irrelevant frames of reference? The answer is definitely in the negative. Many of the leaders were by no means old, and it was one of the oldest of them who proved the most astute in piloting Mitsui through the dangerous currents of the early thirties.

In 1920, the autocratic President of Mitsubishi, Iwasaki Koyata, was only 41 years old, while his close adviser Kimura Kusuyata was still relatively young for a top-rank manager at the age of 55 years. Mitsui's leadership was equally young. Though in 1920 Dan Takuma was 62 years of age, Ikeda Seihin was only 53, Yasukawa 50 and Makita 49.[186] Though the "extra-constitutional" adviser, Masuda Takashi, was fully 72 in 1920,[187]

it was he who was responsible for the skilfull accommodation of Mitsui to the challenge of the early thirties, when amongst other accomplishments he made the sound choice of Ikeda Seihin as overall director to carry out the new policies. Masuda cannot be accused of senility during the twenties.

Let us now turn to the third category of factors which influenced Great Zaibatsu investment behaviour--the lack of confidence of the leadership in Japanese technology. We have already adduced some evidence of this lack of confidence. Let us briefly note this again. We have reasoned that the abandonment of the attempt to industrialize a process for ammonia synthesis by the Oriental Nitrogen Union after 1920 was due to a lack of faith in Japanese technical ability (see page). Dan Takuma at first postponed Mitsui's proposed rayon venture and then later timidly halved the initial scale of the plant, as he doubted Japanese ability in this "new chemical industry" (see page).

There is further evidence. Makita Tamaki, who had come to head Mitsui Mining after World War I, was a graduate of the Mining and Metallurgy Department of Tokyo Imperial University and a technician of some note. While he had played a crucial role in the establishment of the synthetic dye industry after 1915 at Mitsui Mining's Miike complex, he displayed great caution in the field of ammonia synthesis and seems to have made no attempt to persuade Mitsui to move into that area after the Oriental Nitrogen Union abandoned its attempt in 1920.[188]

The lack of confidence of Dan and Makita may well have stemmed in part from their personal, technical experience. Dan had had a bitter

experience of technical failure in Mitsui's attempt to establish a celluloid plant in the late Meiji Period. After six troubled years, Mitsui abandoned the venture, which had never progressed beyond the planning stage.[189] Makita may have based his unfavourable evaluation of Japanese technical capacity on his experience of the development of the synthetic dye industry. If so, Makita was subjecting Japanese technical capacity to an unfairly severe test. Dyes represented the most searching standard of comparison, as success in this field required continual invention of new types of dye and their successful large-scale manufacture at competitive prices. The Germans had a very long start in this field. Their chemical companies had been researching synthetic dyes on a considerable scale since the 1880's and, by 1914, had far outstripped all foreign competition. Prior to World War I, even the U.K. and the U.S. had relied on Germany for synthetic dyes. The dye industry of the U.K., which possessed little research base, produced relatively few dyes and total output was small. The U.S., which as the greatest contemporary textile producer was the largest consumer of synthetic dyes, had almost no domestic dye industry.[190] The limited scale of the dye industry outside of Germany was a measure of the ascendancy of German technology, even over that of the most industrially advanced countries. This ascendancy was based on a superb and, at that period, unique tradition of research within industry, well backed by excellent supporting facilities at the universities. The continuing superiority of the German industry was amply proven by the slow struggling progress of the British and American industries to establish domestic dye enterprises during and after

World War I.[191] It may be that Makita, oppressed by a sense of the vast gulf which separated the Japanese and German chemical industries, lost overall perspective on the world chemical industry.

An even more important cause of the Great Zaibatsu leader's lack of confidence in Japanese technical competence probably lay in a great general sense of inferiority, which nearly all contemporary Japanese felt concerning the West. There can be no doubt that the Japanese people as a whole felt such a strong sense of inferiority and that this sense was particularly marked among the intellectuals and those who knew the West well. Many of the top leaders of the Great Zaibatsu were likely to have felt this sense of inferiority particularly keenly, as they had spent significant portions of their impressionable youth in the West during the Meiji Period, when there was a vast gulf between the Occident and Japan in almost every field of endeavour. In few areas did the gulf open wider than in technology.

Perhaps the most comprehensive, though quite representative, expression of the Japanese inferiority complex in the Meiji Period is the well-known essay of the philosopher, Inoue Tetsujirō,[192] who had studied in Germany for six years. In 1889, writing in the course of a public debate as to whether Japan should be opened to Western residents, he expressed a fear that Japanese could not compete with the "superior races of Western countries" and argued that the Japanese "are greatly inferior to Westerners in intelligence, financial power, physique, and all else" and were "not equal to Westerners in intricate analysis or profound generalization." Very similar views were expressed at this

period by a wide spectrum of Japanese opinion, including Miyake Setsurei, the firmest advocate of the unique value of Japanese civilization; Nishimura Shigeki, a staunch guardian of Japanese traditional morality; and Katō Hiroyuki, a well-known exponent of Darwinist ideas in Japan.[193]

Several of the directors of the Mitsui Gōmei were educated in the West during the Meiji Period. The outlook of Dan Takuma was largely moulded in the U.S. He arrived in Boston, Massachusetts in 1872 at the age of fourteen, and advanced through high school to the Boston School of Technology[194] where he graduated in mining engineering in 1878.[195] He had thus spent six years of the formative period of his life in the West. Dan Takuma, unlike the vast majority of his colleagues, who merely had a "working knowledge" of business English, was completely bilingual. Ikeda Seihin, who headed the Mitsui Bank in the twenties, graduated from Keio in 1888, but proceeded immediately to the U.S. where he took a B.A. at Harvard University before returning to Japan in 1895, having spent fully seven years in the West.[196] Ikeda travelled frequently and extensively in the U.S. and Europe throughout his lifetime and had an excellent knowledge of Western business.[197] Yoneyama Umekichi, who was influential within the Mitsui Bank in the twenties and who was appointed a director of Mitsui Gōmei in 1932, spent no less than eight years in the U.S. between 1887 and 1895 before entering the Mitsui Bank.[198] Masuda Takashi, the "extra-constitutional" adviser of Mitsui, also had some depth of experience of Occidentals, if little of the Occident itself. He was a resident in Yokohama during the early days of Western trade with Japan and worked for one year in a British trading company.[199] Masuda may

also have been profoundly influenced by his younger sister, who had been entirely educated in the U.S. She was so Americanized that, on return to Japan as a young adult, she was completely unable to speak Japanese, and had to relearn the language under the tutelage of her brother. Her Japanese remained faulty for the rest of her life.[200]

Much of the Mitsubishi leadership was also familiar with the West. The President of the combine during the twenties, Iwasaki Koyata, travelled to England in 1900 at the age of twenty-one, after studying for one year in the Faculty of Law at Tokyo Imperial University. He graduated from Cambridge University with a B.A. in history and returned to Japan five years later by way of the U.S.[201] Iwasaki Hisaya, of the inner management group of Mitsubishi in the twenties and president of the combine before Iwasaki Koyata, also spent half of his formative period in the West. He left Japan in 1885 and studied for five years in the U.S., entering the Wharton School of Finance and Commerce at the University of Pennsylvania in 1887.[202] In the U.S. Iwasaki must have obtained some direct knowledge of Western technology, as he was acquainted with Benjamin S. Lyman, a prominent geologist and mining technologist, who had conducted a geological survey of Hokkaido to evaluate the coal resources of that island.[203] Iwasaki made a considerable effort to become acquainted with conditions in the West, as he travelled extensively in Europe and Russia, crossing the Atlantic by "steerage class" which offered a passage of the roughest type.[204] Gō Seinosuke, who was influential in Mitsubishi though he held no official post, entered the Faculty of Law at Tokyo Imperial University in 1883 at the age of eighteen, but left after a year and spent

the seven-year period 1884-1891 in Germany.[205]

Thus, the Chairman of the Board of Directors of Mitsui and the President of Mitsubishi, together with many of their closest supporters, had spent much of their formative periods in the West. Though the biographical material available on these figures, which is considerable in volume, affords little evidence of their real attitudes on important matters, there is no reason to think that these men would have gained a different impression of the relative abilities of Japanese and Westerners from their contemporaries, whose views were so clearly and forcefully expressed.

It is probable that close contact with the West not only fostered a sense of inferiority and thus timidity in the adoption of complex new technology, but also created a sense of identification with the West. This sense of association may well have precluded any strong nationalistic motivation to upgrade technology in order to combat Western economic and military strength.

It is probable that the Great Zaibatsu leaders had come to share the Eurocentric world view of the Europeans. In the environment of the late nineteenth and early twentieth centuries, the leaders in common with many others, almost certainly believed that European culture would expand inexorably, slowly but surely permeating and remoulding the non-European world. Within the foreseeable future all nations would be included within one universal civilization, wholly modelled on that of Europe.

While there is little indication of the thinking of the Great Zaibatsu leaders themselves on this point, there is ample evidence of the views of persons who were very intimately related to them. Katō Kōmei, the Kenseikai leader, who was Prime Minister from June 1924 to January 1926 and the most influential figure in the move toward "parliamentary government" during the tens and twenties, was the husband of the eldest daughter of Iwasaki Yatarō and thus very closely associated with Mitsubishi. There can be no doubt that Katō, who lived in England as Japanese Ambassador for some time, regarded the English parliamentary system and the English gentleman as models for the emulation of the Japanese.[206] Shidehara Kijūrō, the principal architect of the "Soft Diplomacy," was also a great Anglophile. He wore a bowler hat, ate an English-style breakfast, ordered suits from London tailors, and even prepared official documents in English, only later translating them into Japanese.[207] He wished to marry an Englishwoman, but due to the pressure of his relatives and others he married the youngest daughter of Iwasaki Yatarō instead.[208]

Thus, it may well have been that for the Great Zaibatsu leadership in the twenties Europe was an ideal, a model and an accepted superior, as well as a potential enemy. They probably identified themselves, at least to a degree, as the agents and advance guard of the superior European civilization. Other Japanese had a different outlook. They regarded the zaibatsu top management as quasi-traitors. Certainly one of the causes of the anti-Establishment movement of the early thirties was resentment of the extremely accommodating attitude of the Great

Zaibatsu and their political allies toward the West.

Conclusion

We can eliminate two factors which have been suggested as possible causes of Great Zaibatsu sluggishness in the new, technologically intensive industries in our period. The lethargy of the management cannot have been due to differences in managerial structure between the Great Zaibatsu and the rising companies, as the form of management differed greatly in Mitsui and Mitsubishi, with the latter showing resemblance to that of the rising companies. Neither can the sluggishness be traced to the sway of gerontocracy, since the leaders in the twenties were, for the most part, middle-aged.

There were three principal causes of Great Zaibatsu lethargy. It is probable that the leadership of the two great combines which occupied the pinnacle of the economic hierarchy, placed the highest priority on the maintenance of their hegemony. Complacent from their long, almost unchallenged supremacy, they may well have felt that they could hold their position simply by the suppression of rivals without the effort of rapid growth. Risky investment in the new industries would thus have seemed largely unnecessary. Then too there can be little doubt that the managements of the two giant combines identified closely with the West, accepting contemporary Europe as a model for emulation. The sense of confrontation was thus lacking which would have impelled them to establish the new, technologically intensive industries, in an attempt to gain parity with the great occidental powers. The

third factor is the most obvious. The managements of the Great Zaibatsu lacked confidence in Japanese technology. There were two reasons. Firstly, it is probable that the leaders possessed the general sense of inferiority to the West to a much higher degree than the majority of their countrymen. Many of them had spent considerable time in their most impressionable years in the West, at a period when Japan lagged enormously in nearly all fields. Secondly, some at least of the leaders had experienced failure in the importation of new, complex technology prior to World War I.

THE GREAT ZAIBATSU

FOOTNOTES

[1]John G. Roberts, Mitsui: Three Centuries of Japanese Business (New York: Weatherhill, 1973), pp. 13-143 passim.

[2]Noda Nobuo, "Nihon Zaibatsu Shi e no Kiyo," Keiei Shigaku, 5:104, 1971.

[3]Yamamura Kōzō, "The Founding of Mitsubishi: A Case Study in Japanese Business History," Business History Review, 41:141-154, Summer, 1967.

[4]G. C. Allen, A Short Economic History of Modern Japan 1867-1937 (London: Allen & Unwin, 1962), p. 135.

[5]Nihon Kōgyō Ginkō Rinji Shiryōshitsu, Nihon Kōgyō Ginkō Gojū Nen Shi (Tokyo: Nihon Kōgyō Ginkō, 1957), p. 16.

[6]Arisawa Hiromi (ed.), Tekkōgyō (Vol. II of Gendai Nihon Sangyō Kōza, Tokyo: Iwanami Shōten, 1959), p. 26.

[7]Ibid., Table I-2, p. 34.

[8]Iida Kenichi, Ohashi Shūji and Kuroiwa Toshirō (eds.), Tekkō (Vol. IV of Gendai Nihon Sangyō Hattatsu Shi. Tokyo: Tōkōryō, 1965), pp. 212-213.

[9]S. Pollard, "British and World Shipping 1890-1914: A Study in Comparative Costs," Journal of Economic History, 17:438, 1957.

[10]Morikawa Hidemasa, "Senzen Nihon Zaibatsu no Jūkagaku Kōgyō Tōshi ni Kan Suru Kigyōshiteki Kōsatsu," Keizai Shinrin, 29:114, 1961.

[11]Ibid., Table 1.

[12]The following argument is based heavily on Morikawa Hidemasa.

[13]Morikawa, op. cit., Table 2, p. 123.

[14]Allen, op. cit., Table XXXB, p. 220.

[15]If the wholesale price index is used (Ibid., Table XXXA) a somewhat larger profit of 41,859,000 yen is obtained.

[16]Ibid., Table XIIA, p. 202.

[17]Togai Yoshio, "Komento. Mitsui Bussan to no Taihi ni Oite," Keiei Shigaku, Vol. 8, August, 1973, Table 2, p. 30.

[18]Ginkō Kaisha Yōroku (Tokyo: Teikoku Kōshinjo, 1928), p. 210.

[19]Ibid.

[20]Morikawa, op. cit., Table 4, p. 124.

[21]Ginkō Kaisha Yōroku, op. cit., pp. 212, 214.

[22]Morikawa, op. cit., pp. 115-117.

[23]Arisawa, op. cit., p. 43.

[24]Morikawa, op. cit., p. 118.

[25]Ibid., p. 138.

[26]Ibid., p. 140.

[27]This company was the predecessor of the present car manufacturer Isuzu Motors Limited.

[28]This company under different management became the present automotive giant, the Nissan Motor Company.

[29]While the other three firms manufactured trucks, Shirayanagi made passenger cars.

[30]Morikawa, op. cit., p. 141.

[31]Ibid., Table 7.

[32]As both the automobile and aircraft industries were very new in Japan, it is highly unlikely that any high-ranking bureaucrats or military officers had significant experience in either of these fields.

[33]Morikawa, op. cit., p. 118.

[34]A forerunner of the present-day University of Tokyo.

[35]Tōkyō Kōgyō Shikken Jo, Tōkyō Kōgyō Shikken Jo Gojū Nen Shi (Tokyo: Tōkyō Kōgyō Shikken Jo, 1951), p. 587.

[36]Ibid., pp. 584, 586.

[37]Ibid., p. 585.

[38]Nihon Kagaku Shigakkai Hen, Kagaku Gijutsu (Vol. XXI of Nihon Kagaku Gijutsu Taikei. Tokyo: Dai-ichi Hōki Shuppan K.K., 1964), p. 78.

[39]Tsūshō Sangyō Shō, Kagaku Kōgyō Jō (Vol. XX of Shōkō Seisaku Shi. Tokyo: Shōkō Seisaku Shi Kanko Kai, 1968), p. 69.

[40]Watanabe Tokuji (ed.), Kagaku Kōgyō Jō (Vol. XIII of Gendai Nihon Sangyō Hattatsu Shi. Tokyo: Tōkōryo, 1968), p. 182.

[41]The official English language title, which is not a direct translation, is "Government Chemical Industrial Research Institute, Tokyo." Until 1918, when the Osaka Industrial Experimental Station was established, the Tokyo Industrial Experimental Station was known simply as the Industrial Experimental Station (Kōgyō Shikkenjo).

[42]Tōkyō Kōgyō Shikken Jo, op. cit., pp. 575-580.

[43]Ibid., p. 1.

[44]Ibid.

[45]Ibid., p. 2.

[46]Ibid.

[47]Ibid., p. 26.

[48]Ibid., p. 11.

[49]Ibid., pp. 20-21.

[50]Nissan Kagaku Kōgyō K.K., Nissan Kagaku Kōgyō Hachijū Nen Shi (Tokyo: Nissan Kagaku Kōgyō K.K., 1969), p. 43.

[51]Nihon Kagaku Shigakkai Hen, loc. cit.

[52]Sakura Bi Kai, Nihon Rikugun Kayaku Shi (Tokyo: Sakura Bi Kai, 1969), p. 22.

[53]Tsūshō Sangyō Shō, op. cit., p. 71.

[54]Shibamura Yōgo, "Oya Jun to Sumitomo no Kagaku Kōgyō: Nihon Kagaku Kōgyō o Kizuita Hitobito," Kagaku Keizai, January, 1969, pp. 82-83.

[55]Shiohara Matasaku, Takamine Hakushi (Tokyo: Shiohara Matasaku, 1926), pp. 10-12.

[56]Ibid., pp. 20-28; and Nissan Kagaku Kōgyō K.K., op. cit., pp. 34-35.

[57]Shiohara, op. cit., p. 17.

[58]Shirato Manjirō, "Amumonia Yori Shōsan no Seizō," Kagaku No Tomo, 9:22, January, 1917.

[59]Isumi Jisuke, "Bariyumu no Yōryō Bunseki," Kagaku No Tomo, 11:8, January, 1919.

[60]M.T., "Kagaku Yakuhin no Shikken Hō," Kagaku No Tomo, 11:233, August, 1919.

[61]Arisawa Hiromi (ed.), Kagaku Kōgyō (Vol. IV of Gendai Nihon Sangyō Kōza. Tokyo: Iwanami Shoten, 1959), pp. 28-29, 33.

[62]Shibamura Yōgo, "Meiji Gōki no Kagaku Kōgyō 4. Rensai. Nihon no Kagaku Kōgyō Keiei no Keifu," Kagaku Keizai, July, 1965, p. 83.

[63]Nihon Chisso Hiryō K.K. Bunshoka, Nihon Chisso Hiryō Jigyō Taikan (Osaka: Nihon Chisso Hiryō K.K., 1937), pp. 449-450.

[64]Watanabe, op. cit., p. 264.

[65]Nihon Chisso Hiryō, op. cit., pp. 433-442.

[66]Watanabe, op. cit., pp. 182-183.

[67]Monbushō (ed.), Sangyō Kyōiku Nanajū Nen Shi (Tokyo: Monbushō, 1956), Table 7, p. 1022 and Table 8, p. 1023.

The age of the students enrolled in these institutions is uncertain and probably varied with time; the average age of "freshmen" probably rose. In the early period entrants may have been as young as thirteen. I have styled these institutions "colleges," though the term "schools" might be more appropriate.

[68]Ibid.

[69]L. F. Haber, The Chemical Industry 1900-1930 (Oxford: Clarendon Press, 1971), pp. 48, 59.

[70]Annual Report of Minister of State for Education, Years 1916-1917-1931-1932 (Tokyo: Translated and published by the Department of Education). The Annual Reports for the years prior to 1917-1918 were not available.

[71]Ibid.

[72]Haber, op. cit., Table 11.1, p. 320.

[73]Ibid., p. 59.

[74]Statement by Uchida Hoshimi, Professor, Tōkyō Keizai Daigaku (Tokyo University of Economics), personal interview, August, 1973.

[75]Haber, op. cit., Table 11.1, p. 320.

While the value of money had fallen to approximately half its 1914 level by 1927, the prices of most chemical products had fallen in an approximately similar proportion.

[76]Ibid., and p. 48.

[77]W. W. Lockwood, The Economic Development of Japan: Growth and Structural Change (Princeton: Princeton University Press, 1954), p. 156.

[78]Ōhara Shakai Mondai Kenkyūjo, Nihon Rōdō Nenkan, Vol. VI (Tokyo: Tōyō Keizai Shimpōsha, 1925), p. 43.

[79]Ōhara Shakai Mondai Kenkyūjo, Nihon Rōdō Nenkan, Vol. XIII (Tokyo: Tōyō Keizai Shimpōsha, 1932), pp. 70-71.

[80]Ibid.

[81]Statement by Fujimori Tatsumurō, personal interview, September, 1972. Fujimori was formerly a senior engineer with Shōwa Fertilizers.

[82]Haber, op. cit., pp. 92-95.

[83]Ibid., p. 90.

[84]Ibid., p. 91.

[85]Ibid., pp. 205-206; and W. J. Reader, The Forerunners 1870-1926 (Vol. I of Imperial Chemical Industries: A History. London: Oxford University Press, 1970), pp. 350-351.

[86]Tōkyō Kōgyō Shikken Jo, op. cit., p. 220.

For Japanese doubt as to their technical capacity in ammonia synthesis even in 1930 see:

Ibid., p. 226; and Shibamura Yōgo, "Sangyō Shihongata Kigyō no Seiritsu: Shōwa Hiryō no Sōsetsu to Hatten. Jō," Kagaku Keizai, June, 1966, p. 57.

[87]Tōkyō Kōgyō Shikken Jo, op. cit., p. 221.

[88]Ibid., p. 220.

[89]Ibid., p. 222.

[90]Ibid.

[91]Ibid., pp. 223, 225.

[92]Ibid., p. 223.

[93]Ibid.

[94]Ibid., p. 224.

[95]Ibid., p. 13.

[96]Nihon Ryūan Kōgyō Kyōkai, Nihon Ryūan Kōgyō Shi (Tokyo: Nihon Ryūan Kōgyō Kyōkai, 1968), p. 60; and Suzuki Tatsuji, Enshū Manpitsu (Tokyo, 1927), p. 169.

[97]Ibid., pp. 2-3.

[98]Ibid., pp. 168,171.

[99]Tōkyō Kōgyō Shikken Jo, op. cit., p. 221.

[100]Nihon Ryūan Kōgyō Kyōkai, op. cit., p. 127.

[101]Shibamura Yōgo, "Takamine Jōkichi to Shiohara Matasaku. Ge," Kagaku Keizai, October, 1968, p. 84; and Nihon Ryūan Kōgyō Kyōkai, op. cit., pp. 124-125.

[102]Ibid., pp. 60-61.

[103]Ibid., pp. 127-128.

[104]Ibid.; and Uchida Hoshimi, "Taishō: Shōwa Shoki no Kagaku Kōgyō ni Okeru Gijutsu Dōnyū to Jishu Kaihatsu: Kokusai Gijutsu Iten Katei to Shite Mita Kigyō Katsudō," Keiei Shigaku, 7:78, May, 1972.

[105]Shiraishi Tomoji (ed.), Kaneko Naokichi Den (Tokyo: Kaneko Yanagida Ryōō Shōtokukai, 1950), p. 204; and Nihon Chisso Hiryō, op. cit., p. 458.

[106]Tanaka Hisaichi, "Fuaza Densō ni Tsuite," Kagaku Kōgyō, 2:442, May, 1951.

[107]Ibid., Table 1, p. 451.

[108]Haber, op. cit., Table 4-1, p. 96.

[109]Kabushiki Nenkan 1926 (Osaka: Ōsaka-ya Shoten Chōsa-bu), p. 338.

[110]Nihon Chisso Hiryō, op. cit., pp. 461-464; and Kabushiki Nenkan 1933 (Osaka: Ōsaka-ya Shoten Chosa-bu), p. 267.

[111]Nihon Ryūan Kōgyō Kyōkai, op. cit., Table 5-4, p. 775; and Kondō Yasuo, Ryūan: Nihon Shihonshugi to Hiryō Kōgyō (Tokyo: Nihon Hyōronsha, 1950), Table 3, p. 279 and Table 5, p. 282.

[112]Haber, op. cit., p. 5; and Uchida, op. cit., p. 79.

[113]Ibid., pp. 79-80.

[114]Fukushima Katsuyuki (ed.), Ichiryū no Mugi (Vol. I of Teijin no Ayumi (Tokyo: Teijin K.K., 1968), p. 131.

[115]Ibid., p. 33.

[116]Ibid., p. 49.

[117]Ibid., p. 40.

[118]Ibid., pp. 70-73.

[119]Ibid., p. 48.

[120]Ibid., p. 174; and Shibamura Yōgo, "Noguchi Jun to Kagaku Kōgyō: Nihon Kagaku Kogyo o Kizuita Hitobito 20," Kagaku Keizai, December, 1969, p. 93.

[121]Fukumoto Kunio (ed.), Noguchi Jun wa Ikite Iru (Tokyo: Fuji International Consultants, 1964), p. 49; and Shibamura, December, 1969, op. cit., p. 94.

[122]Kajinishi Mitsuhaya (ed.), Seni Jō (Vol. XI of Gendai Nihon Sangyō Hattatsu Shi. Tokyo: Tōkōryo, 1964), Table IV-143, p. 523.

[123]Ibid.; and Fukushima, op. cit., p. 170.

[124]Kajinishi, op. cit., pp. 519, 523; and Fukushima, op. cit., p. 175.

[125]Tōkyō Kōgyō Shikken Jo, op. cit., p. 416.

[126]H. R. Mauersberger and E. W. K. Schwartz, Rayon and Staple Fiber Handbook (New York: Rayon Handbook Company, 1939), p. 115.

[127]Uchida, op. cit., p. 80.

[128]Kajinishi, op. cit., Appendix, pp. 42-43.

[129]Fukumoto, op. cit., pp. 49-50.

[130]Shibamura Yōgo, "Iwasaki Toshiya to Sōda Kōgyō: Nihon Kagaku Kōgyō o Kizuita Hitobito 12," Kagaku Keizai, March, 1969, p. 85.

[131]Shibamura Yōgo, "Meiji Goki no Kagaku Kōgyō 3. Rensai. Nihon no Kagaku Kōgyō: Keiei no Keifu," Kagaku Keizai, June, 1965, p. 81; and Shibamura Yōgo, "Fujiyama Jōichi to Kabaido Kōgyō: Nihon Kagaku Kōgyo o Kizuita Hitobito 9," Kagaku Keizai, December, 1968, p. 77.

[132]Ogawa Ritoku, "Yon Daikontsuerun no Sanbō Honbu no Hitobito," Chūokōron, July, 1931, p. 318.

[133]Morikawa, op. cit., p. 133.

[134]Uchida, loc. cit.

[135]Tōyō Rēyon K.K. Shashi Henshū Iinkai, Tōyō Rēyon Shashi 1926-1953 (Tokyo: Tōyō Rēyon K.K., 1954), p. 64.

[136]Ibid.

[137]Ibid., p. 65.

[138]Ibid., p. 67.

[139]Ibid.

[140]Ibid.

[141]Ibid., p. 68.

[142]Ibid., p. 70.

[143]Ibid., p. 76.

[144]Ibid., pp. 75-76.

[145]Ibid., p. 77.

[146]Ibid., pp. 77-78.

[147]Ibid., p. 83.

[148]Ibid., p. 84.

[149]Ibid., p. 87.

[150]Ibid., p. 83.

[151]Ibid.

[152]Ibid., p. 84.

[153]Fukushima, op. cit., pp. 189-191.

[154]Tōyō Rēyon, op. cit., p. 83.

[155]Ibid., p. 92.

[156]Okumura Masao, "Tōyō Chisso Kōgyō Kabushiki Kaisha Oboegaki," Ikite Iru Hiryō Shi, ed. Saitō Tokuji (Tokyo, 1952), p. 106.

[157]Nihon Ryūan Kōgyō Kyōkai, op. cit., p. 61.

[158]Okumura, op. cit., p. 107.

[159]Ibid.

[160]Ibid.

[161]Haber, op. cit., pp. 29, 96, 178, 205.

[162]Okumura, op. cit., pp. 107-109.

[163]Ibid., p. 108.

[164]Watanabe, op. cit., p. 301.

[165]Ibid.

[166]Ibid.; and Okumura, op. cit., pp. 108-109.

[167]Nihon Ryūan Kōgyō Kyōkai, op. cit., p. 68.

[168]Okumura, op. cit., p. 111.

[169]Nihon Ryūan Kōgyō Kyōkai, op. cit., Table II-16, p. 137.

[170]Ibid. and pp. 152, 155; and Kabushiki Nenkan 1935 (Osaka: Ōsaka-ya Shoten Chōsa-bu).

[171]"Tōyō Tōatsu Kōgyō K.K.: Hikoshima Kōgyōsho Gojū Nen Shi" (unpublished manuscript, 1939), p. 155.

[172]Shibamura Yōgo, "Zaibatsukei Anmonia Kōgyō no Seiritsu: Nihon no Kagaku Kōgyō Keiei no Keifu 18," Kagaku Keizai, September, 1966, p. 105.

[173]Nihon Ryūan Kōgyō Kyōkai, op. cit., Table II-16, p. 136; and statement by Ishige Ikuji, who was in charge of the Hikoshima Plant immediately after the Mitsui takeover, personal interview, May, 1973.

[174]Nihon Ryūan Kōgyō Kyōkai, loc. cit.

[175]Morikawa, op. cit., pp. 150-152.

[176]Ogawa, op. cit., pp. 317-318.

[177]Ibid., p. 318.

While the list strictly relates to mid-1931, all of the figures noted were powerful during much of the twenties.

[178]Roberts, op. cit., pp. 217, 228-229, et seqq.

[179]Ogawa, op. cit., p. 322.

[180]Noda Yutaka, "Mitsubishi Zaibatsu Ron," Chūōkōron, May, 1934, p. 269.

[181]Ibid., p. 274; and Seikō Shuppan K.K., Nihon Zaikai Jinbutsu Reiden Vol. II (Tokyo: Seikō Shuppan, 1963), p. 271.

[182]Takahashi Kamekichi,"Kyodai Zaibatsu no Hōkō Tenkan," Chūōkōron, May, 1932, p. 67.

[183]Noda Yutaka, op. cit., p. 268.

[184]Seikō Shuppan K.K., Nihon Zaikai Jinbutsu Reiden Vol. I (Tokyo: Seikō Shuppan, 1963), p. 1086.

[185]Takahashi, op. cit., p. 70.

[186]Seiko Shuppan, op. cit., Vol. I, pp. 404, 495, 747, 1085 and Vol. II, pp. 271, 417; and Shibamura Yōgo, "Mitsui no Kagaku Kōgyō to Makita Tamaki: Nihon Kagaku Kōgyō o Kizuita Hitobito 18," Kagaku Keizai, October, 1969, p. 90.

[187]Nagai Minori, Jijo Masuda Takashi Okina Den (Kamakura: Nagai Minori, 1939), p. 135.

[188]Shibamura, October, 1969, op. cit., pp. 90-94.

[189]Seikō Shuppan, op. cit., Vol. II, p. 410.

[190]Haber, op. cit., p. 29.

[191]Ibid., pp. 188-192, 297, 299, 313.

[192]Inoue Tetsujirō was among the first students to graduate from Tokyo Imperial University in philosophy. He served as an assistant professor at that institution before travelling to Germany in 1884. Inoue's essay was written to oppose the opening of Japan to foreign residence, travel and commerce, as proposed by Inoue Kaoru and Okuma Shigenobu. (Kenneth B. Pyle, The New Generation in Meiji Japan: Problems of Cultural Identity 1885-1895 (Stanford: Stanford University Press, 1969), pp. 110-111.)

[193]Ibid.

[194]The forerunner of the present Massachusetts Institute of Technology (MIT).

[195]Ogawa, op. cit., p. 319.

[196]Seikō Shuppan, op. cit., Vol. I, p. 747.

[197]Yanagizawa Takeshi, Zaikai Kaikō (Tokyo: Sekai no Nihonsha, 1949, pp. 51, 57, 91-92, 111 etc.

[198]Seikō Shuppan, Vol I.

[199]Nagai, op. cit., pp. 67, 123.

[200]Ibid., p. 135.

[201]Seikō Shuppan, op. cit., Vol. I, p. 1086.

[202]Iwasaki Hisaya Den Hensan Iinkai (Mitsubishi), Iwasaki Hisaya Den (Tokyo: Iwasaki Hisaya Den Hensan Iinkai (Mitsubishi), 1961), p. 203.

[203]Ibid., p. 212.

[204]Ibid., p. 215.

[205]Seikō Shuppan, op. cit., Vol. II, p. 273.

[206]Peter Duus, Party Rivalry and Political Change in Taishō Japan (Cambridge, Mass.: Harvard University Press, 1968), pp. 61, 82, 95-96.

[207]Bamba Nobuya, Japanese Diplomacy in a Dilemma: New Light on Japan's China Policy 1924-1929 (Vancouver: University of British Columbia Press, 1972), pp. 138-139.

[208]Ibid., pp. 148-149.

CHAPTER III

PUSSYFOOTS EXTRAORDINARY: THE TEXTILE COMPANIES

I. INTRODUCTION

In the first half of the 1920's, conditions were very favourable for the establishment of rayon manufacturing enterprises. By 1920, the Japanese technical base in rayon was considerable, technicians were available in super-abundance, foreign technology was readily obtainable, and domestic and world demand for rayon was rising rapidly. By 1924, at the latest, two companies--Imperial Rayon and Asahi Silk-- had clearly demonstrated the profitability of the industry.

Of all enterprises the textile companies were by far the most favourably placed to enter the industry. They not only had well-established sales networks for textile products, but were already active in the critically important spinning sector, where they possessed considerable pools of accumulated expertise at the managerial and operative levels, as well as considerable technical experience. In the early 1920's, most rayon was marketed as a mixed weave, and the textile firms had a further advantage, as they were the producers of the non-rayon components of the weave. The scale of a rayon plant, too, was comparable to that of the cotton spinning mill, in which the textile firms had so much experience.

With all of these advantages, it might be thought that the textile companies would have responded vigorously to the opportunity in

rayon. Yet, they did not. Most took no action at all in the 1920's; a few did enter the field, but only slowly and hesitantly. Let us first consider the record of the textile firms in the rayon industry and then discuss the reasons for their poor performance.

II. RESPONSE

As the cotton spinning companies assigned little importance to their rayon manufacturing branches and as they were far from proud of their early record in the industry, the histories of these companies give little space to rayon and, consequently, we know little about how rayon manufacturing developed within these enterprises.

The first cotton spinning company to enter the rayon industry was Japan Spinning, which established the subsidiary Japan Rayon in March, 1926, with the contribution of one-third of the total capitalization.[1] This was no less than eight years later than the founding of the Suzuki subsidiary Imperial Rayon and four years later than the establishment of Asahi Silk by Noguchi Jun.

Japan Rayon used the safest,if most expensive,method of maximum involvement (see Appendix p.) in technology importation. All equipment was imported from Oscar Kohorn of Germany, and seven foreign technicians were employed during the construction of the plant and the period of trial operation.[2] Not only was the venture late in time, but the scale of operation was rather small for the latter twenties. Even in 1929, output was only three tons per day of viscose, compared to fourteen tons per day at Imperial Rayon.

Kurashiki Spinning was the second cotton spinning company to enter rayon manufacture. It was not usually classed as a textile major, though of comparable size to the smallest of the six firms normally ranked as majors.

Kurashiki Spinning was perhaps the earliest of the textile companies to investigate the possibility of establishing a rayon plant. In March 1924 the company produced a study entitled "A Report of an Investigation into the Rayon Spinning Industry," which noted that there was no problem in equipment supply, but that there were technical difficulties in the proportion of the mix of chemicals in the preparation of viscose, and in the control of the temperature of the viscose prior to extrusion. The report further noted that the Suzuki Shōten had successfully imported one set of foreign machinery and then had had many sets cheaply made on the foreign model by Japanese manufacturers. An appended table showed costs and returns for a hypothetical plant, indicating a profit ratio of fully thirty per cent. The report concluded that the field was very promising. Yet, Kurashiki Spinning took no action of any kind for more than a year and simply continued to observe the development of the rayon industry.[3]

Finally, in 1925, the company did act. It moved to adopt foreign technology by the method of self-development (see Appendix p.) and invested 200,000 yen to establish the Kyōto Chemical Research Station, which was headed by Professor Fukushima Tsuzō of Kyōto Imperial University. Research progressed slowly, however, and Kurashiki Spinning moved to import developed technology instead. The firm established Kurashiki Silk

in June 1926, subscribing more than fifty per cent of the initial capital.[4] The technology developed at the Kyōto Chemical Research Station was not used and technology was purchased from the French firm Emile Brunel. There was no foreign tutelage in Japan, but technicians were despatched to Europe for study. One set of European equipment was purchased and, using it as a model, further sets were made up in Japan. The total cost of the plant was three million yen.[5]

The plant started production in June 1928, but the Japanese manufactured pots (or Topham boxes), unlike those installed some years before at Imperial Rayon, did not work well and, as a consequence, the parent company paid no dividend from the second half of 1930 to the second half of 1932.[6] After 1932, however, the operation became very profitable. Thus, Kurashiki Spinning, while at first hesitant, moved boldly after 1925 considering the small size of the firm.

The third cotton spinning firm to enter rayon was Oriental Spinning, which was the largest spinning firm in Japan. Remarkably few details are available of the firm's activities in rayon, though the company published a medium-length history in 1953.[7]

Oriental Spinning established Shōwa Rayon in December 1927. The company became a separate corporate entity in March 1928, having an authorized capital of fifty million yen. The method of technology transfer appears to have been that of maximum involvement in cooperation with Oscar Kohorn. For the late 1920's, the scale of the plant was small, being only four tons viscose per day.[8]

In addition to the ventures of the two pioneers and the three spinning companies we have discussed above, three other rayon enterprises were founded in the twenties. By far the most important of these was Mitsui's Oriental Rayon, which we have already discussed. The other two operations were Tokyo Rayon, established in April 1926, and Japan Wool Weaving: Rayon Division, set up in October 1927. Both were minor ventures and little is recorded of their activities. Neither was an independent producer by 1934.[9]

Following the establishment of Shōwa Rayon in December 1927, no further rayon enterprises came into existence until the founding of Toyota Spinning's Shōnaigawa Rayon in December 1932, which was the first of a great wave of new establishments[10] (Table XVII).
The reasons for this lag are plain. Firstly, the Bank of Taiwan Crisis of 1927 (see page) initiated a period of acute financial instability and general uncertainty. Secondly, domestic consumption of rayon, which had expanded rapidly from 1921 to 1929, increased only gradually in the slump years 1929-1931, leaving little room for new producers.[11] The great boom in the establishment of new rayon enterprises following December 1932 was a result of the very favourable competitive position enjoyed by Japanese firms on the world market, given the mastery which the Japanese had gained in rayon manufacturing technology and the sharp devaluation of the yen after the abandonment of the gold standard in December 1931.

Let us briefly examine the record of entry into rayon of the remaining textile majors.

TABLE XVII

NEW RAYON ENTERPRISES 1932-1938

COMPANY NAME	PAID-UP CAPITAL*	PARENT COMPANY	INITIAL PLANNED PRODUCTIVE CAPACITY†		DATE ESTAB-LISHED	START OF PRO-DUCTION
			Rayon	Staple		
Shōnaigawa Rayon	750	Toyota Spinning	1.0	-	Dec 1932	Oct 1933
Menka Rayon	2,500	Menka Spinning	4.0	2.0	Feb 1933	Jan 1935
Nisshin Rayon	2,500	Nisshin Spinning	3.0	2.0	Feb 1933	May 1934
Nittō Spinning	-	Nittō Spinning	-	1.5	Feb 1933	Nov 1933
Fukushima Rayon	1,750	Fukushima Spinning	5.0	-	Mar 1933	Oct 1934
Japan Spinning	-	Japan Spinning	-	7.0	Jun 1933	Apr 1935
Kanegafuchi Spinning	-	Kanegafuchi Spinning	5.0	-	Jul 1933	Mar 1936
Shinkō Rayon	2,500	Shinkō Wool Weaving	-	10.0	Aug 1933	Dec 1935
Nagashi Textiles	1,400	Nagashi Plant	6.0	-	Nov 1933	Aug 1936
Sun Rayon	3,500	Tamura Koma	5.0	-	Jan 1934	Apr 1936
Japan Artificial Wool	2,500	Sun Life	4.0	-	Mar 1934	Jul 1936
Meishō Rayon	2,500	Meishō Spinning & Weaving	-	3.0	Mar 1934	Nov 1936
Tōpō Artificial Textiles	2,500	Ushiromiya Akashi	-	6.0	Jun 1934	Dec 1936
Kishiwada Rayon	4,000	Kishiwada Spinning	5.0	-	Jul 1934	Feb 1936
Spinning Machine Manufacturing	-	Spinning Machine Manufacturing	-	2.0	Jul 1934	-
Shōwa Artificial Silk	1,250	Shōwa Fertilizers	10.0	-	Aug 1934	Jul 1935
Hiji Spinning & Weaving	5,200	Ōgawa Group	-	16.0	Sep 1934	Mar 1938
Imperial Rayon No. 2	5,000	Imperial Rayon	20.0	-	Sep 1934	Dec 1935
Japan Artificial Textiles	250	Kimura Family	-	3.3	Sep 1934	Sep 1935
Niigata Rayon	750	Nakano Family	-	2.0	Sep 1934	Apr 1936
Izumo Weaving	5,200	Izumo Weaving	15.0	7.0	Nov 1934	Feb 1936
Fuji Textiles	-	Fuji Gas Spinning	5.0	1.5	Mar 1935	Apr 1936

*Thousands of yen

†Tons per day

NOTE: Companies numbered among the six majors underlined.

Nisshin Spinning was one of the first of the new wave of companies, as it founded a plant in February 1933. Kanegafuchi Spinning, although it had made no move to enter the industry in the 1920's, moved early in the second wave and founded a plant in July 1933. Osaka United Spinning showed no interest in the rayon industry in the twenties and, in 1931, merged with Oriental Spinning. Fuji Gas, too, showed no interest whatsoever in the industry during the twenties, and in the thirties the firm did not move until the very end of the rayon boom.

III. THE SEVEN PUSSYFOOTS

Thus, of the six major textile companies in the twenties, Oriental Spinning, Kanegafuchi Spinning, Japan Spinning, Fuji Gas Spinning, Nisshin Spinning and Osaka United Spinning, only two entered the rayon industry and even they did so well behind the pioneers in the field. Of the remaining four, three entered the rayon industry only during the great boom of the early thirties, while the fourth was absorbed by another company. Why were the textile majors so hesitant?

Were there restraints on their entry to the field? Did the textile companies lack financial reserves adequate for the establishment of new enterprises? Were they, in fact, controlled by the zaibatsu, so that their lack of enterprise simply reflected the sluggishness of their masters, whose attitudes we have already discussed? The answer to all these questions is a definite "no." Textile capital in the twenties was both rich and free.

None of the major textile companies lists any of the zaibatsu, or any person closely related to a zaibatsu, as a principal shareholder.[12]

While three of the majors did have ties with the zaibatsu, these ties were far from tantamount to zaibatsu control.[13]

At Kanegafuchi Spinning, the President, Mūtō Sanji, had previously served in the Mitsui Bank and had, in fact, entered Kanegafuchi on transfer to that firm from Mitsui, at a time when Kanegafuchi was a Mitsui subsidiary. By World War I, Kanegafuchi Spinning had become independent of the Great Zaibatsu, and much of Mūtō's later career was spent in political opposition to Mitsui and not in the service of that combine. Mūtō, who was a prominent politician, headed the Jitsugyō Dōshikai, an organization of the smaller capitalists founded specifically to combat zaibatsu power. (For more detailed treatment, see page 340.)

The President of Fuji Gas Spinning, Wada Tomoji, had been a contemporary of Mūtō at the Mitsui Bank. There is no evidence of any special relation between Fuji Gas Spinning and Mitsui, though some sources state that there was a connection with Mitsubishi.[14] While Fuji Gas Spinning may have sold extensively through the Mitsubishi sales network and one director of that firm was the Mitsubishi director, Iwasaki Hisaya,[15] there is no evidence to suggest that the zaibatsu exerted any degree of control over the spinning company. Wada was eminent in the financial world and even eventually came to succeed the illustrious Shibusawa Eiichi as its leader.[16] With the connections inherent in such a position, Wada could have had the marketing facilities of many companies and a multitude of possible financial backers. Thus, he could never have fallen into dependence on any one zaibatsu.

While one director of Nisshin Spinning, Iwasaki Seishichi,[17] may well have been a member of the family which controlled Mitsubishi, the firm was otherwise unconnected to the zaibatsu.

There is no evidence that the leading figures in the other textile majors were connected to the zaibatsu in any way.

The six textile majors had enormous financial strength throughout the 1920's[18] (Table XVIII). Their cash reserves were unparallelled. Japan Spinning had no debt whatsoever and no issue of company bonds during the twenties, while Oriental Spinning was almost as free of debt. During the decade, these two companies, together with Kanegafuchi Spinning, approximately doubled their paid-up capital and total reserves. Two other smaller majors, though not quite so strong, were still in excellent financial health. Fuji Gas Spinning, while depleting its reserves somewhat between 1919 and 1931, almost tripled its paid-up capital. Nisshin Spinning more than tripled its paid-up capital and increased its reserves, though these continued to be relatively small. Osaka United Spinning had considerable reserves at the end of World War I, but appears to have depleted them in the course of expansion in cotton spinning during the twenties. Due to its merger with Oriental Spinning, no figures are available for this company for 1931.

The textile majors augmented the reserves which they had accumulated during the World War I boom by sound tactics in their main field of cotton spinning. They countered rather tight demand for cotton textiles by considerable inter-company collusion, improvements in management, and a steady and rather rapid upgrading of a well-established

TABLE XVIII

THE TEXTILE MAJORS: FINANCIAL STRUCTURE

Company name	Bonds and debt		Reserves and carry over		Paid-up capital		Fixed capital		% of Japanese production*	
	1919	1931	1919	1931	1919	1931	1919	1931	1919	1931
Oriental Spinning	1,000	-	29,283	71,872	19,625	49,975	21,968	66,229	18.6	19.7
Kanegafuchi Spinning	6,000	20,000	28,641	57,536	15,786	28,596	17,125	53,926	15.2	7.7
Japan Spinning	-	-	25,165	44,919	22,580	52,000	10,873	61,536	15.9	9.6
Fuji Gas Spinning	6,000	15,000	13,777	7,641	13,000	34,000	20,345	49,147	6.8	4.8
Nisshin Spinning	500	4,800	1,524	6,138	4,999	18,300	2,282	23,780	1.9	3.9
Osaka United Spinning†	801		10,687		10,250		4,077		7.1	

*Refers to physical volume of production

†This company merged with Oriental Spinning early in 1931 and there are no figures for the company in that year.

NOTE: All figures in thousands of yen.

if basically simple and undemanding technology.[19]

The cash reserves of even the smallest of the majors were more than ample to mount a rayon operation without any public borrowing whatsoever. Kurashiki Spinning, as we have seen, had set up a rayon venture for only three million yen.

The rather small (four tons of viscose per day) plants of Menka Rayon and Nisshin Spinning were established by subsidiaries with a paid-up capital of only 2,500,000 yen. The richer of the major spinning companies had sufficient cash reserves to set up many rayon ventures, had they wished to do so.

The financial strength of the textile majors was unique in the depression-ridden and crisis-frought Japanese economy of the 1920's. It was something the Great Zaibatsu, themselves, might well have envied.

Of the three cotton spinning companies which established rayon enterprises in the twenties, only the relatively small Kurashiki Spinning can be said to have acted boldly. The rayon venture represented a much larger fraction of the total size of Kurashiki than the rayon ventures of Oriental Spinning and Japan Spinning did of their parent companies. Not only was the firm much smaller than these two majors, but its rayon venture was larger. In the last half of 1934, the profit of Kurashiki Silk was more than twice that of Japan Rayon and probably much greater than that of Shōwa Rayon[20] (see Table XXVI, Page 205). While no figures are available for the capitalization and reserves of Kurashiki Spinning, we can form some idea of the company's size. In 1919 and 1931, the firm ranked sixth in value of production by weight, accounting

for four per cent of total Japanese production in 1931, as compared to nearly twenty per cent for the industry leader, Oriental Rayon.[21] The firm had a slightly bigger output than Nisshin Spinning in 1931 and we will probably not be grossly in error if we assume that the size of its paid-up capital and reserves was about the same, i.e. about twenty-four million yen in 1931. The rayon enterprise would thus represent about one-eighth of Kurashiki Spinning's total investment. However, one should beware of exaggerating Kurashiki Spinning's achievements, as the company's operation did not come on stream until well after the pioneering plants of Kaneko and Noguchi.

Kurashiki Spinning probably owed its more enterprising spirit to its management, which was very different from that of the other spinning firms. The company was controlled by the Christian Ōhara Magosaburō, who established the Ōhara Centre for the Study of Social Problems to research labour conditions.[22] Ōhara's plants were noted for model conditions of employment.

As there is almost a complete lack of information, we cannot comment on the reasons for the sluggishness of the two majors—Japan Spinning and Oriental Spinning—which moved, though timidly and belatedly, into the rayon industry during the twenties. Nor for the same reason can we comment on the inactivity of Osaka United Spinning during the same period. There is sufficient information, however, to comment on the other majors.

Nisshin Spinning, which established a rayon plant in December 1932, sharply increased its share of Japanese cotton production during

the 1920's in an unparallelled expansion, which brought fixed capital by 1931 to ten times the 1919 total. Although the firm's liquid reserves were small, it had financed a significant part of its expansion of fixed capital out of profits (Table XVIII,page 157). Thus, even if the financial backers of the company had not wished to capitalize a rayon venture, the firm could certainly have raised the comparatively small amount of funds required to enter rayon from its own profits, if it had desired to enter the new field.

Why was it that Nisshin Spinning, which was so active in expansion in cotton, did not move into rayon? In part, it may have been because the firm had already taken some risk by establishing a plant in China in 1923[23] on a scale which, although small in relation to the cotton spinning plants of the largest companies in China, was large considering the relatively small scale of the parent company in the early twenties.. A further factor was the character of the management. The company was headed by the Managing Director, Tamura Yuzō, between 1920 and 1935. Tamura had entered the company after a period of employment with Japan Raw Cotton and was an expert in the buying of raw cotton and at setting contracts for cotton thread and cloth, but he appears to have had little interest in textile technology.[24]

Kanegafuchi Spinning was the second of the remaining majors to enter rayon. Why did Kanegafuchi make no move in the twenties? It was not that the firm had invested at considerable risk in China. Of the majors, only Kanegafuchi Spinning and Osaka United Spinning had no plants in China. The answer probably lay in the character of the

company's president. In marked contrast to Kaneko Naokichi, Mūtō Sanji had little interest in the importation of technology or industrial development. In the enormous volume of Mūtō's writings and utterances, there is almost nothing relating to technology or industrial strategy.[25] He was concerned almost exclusively with political and social matters. In part, his lack of interest in technology may have stemmed from his early training at the trade-oriented Mitsui Bank in the 1890's. While it is true that Mitsui, at that time, under the dynamic leadership of Nakamigawa Hikojirō, was developing a considerable and diversified industrial sector, the build-up was conducted mostly by take-over rather than by industrialization of new imported technology.

What of Fuji Gas Spinning, the last firm to establish a rayon enterprise in the boom of the mid-thirties? It had ample reserves in the early twenties to embark on a large rayon venture. The firm did have a modest amount of capital invested in a medium-scale plant in China (Table XXXIV, page 342). The main reason for the firm's lack of enterprise in rayon, as with Nisshin Spinning and Kanegafuchi Spinning, almost certainly lay with the character of the management. Wada Tomoji, like Mūtō, had spent much of his formative period in the Mitsui Bank. Like Mūtō, he had little interest in technology, as he was deeply engrossed in playing a leading role in the organizational and social activities of the Japanese financial world.[26]

IV. CONCLUSIONS

The six major cotton spinning companies and Kurashiki Spinning were free agents. They were entirely independent of zaibatsu control and, in fact, some took political stances against the zaibatsu during the twenties. They were far from short of capital. Of the six majors, three had reserves which were many times the size necessary to establish a medium-scale rayon venture. The reserves of the other three and Kurashiki Spinning, while not nearly so vast, were more than adequate to float a rayon manufacturing arm. With the rapidly rising internal demand for rayon there was room for additional domestic rayon producers throughout the twenties. Yet the majors, far from pioneering in an industry where they had overwhelming competitive advantages and for which the future was obviously bright, hung back like timid cats at the water's edge. Two of the majors, it is true, did take advantage of the opportunity, but so tardily and on such a small scale that they too can be charged with timidity. Of the remaining four, none acted until the devaluation of the yen in the early thirties and the progress of Japanese technology virtually guaranteed the success of any Japanese rayon venture. Kurashiki Spinning was undoubtedly bolder. The firm, though only as large as the smallest of the six majors, was the first to show interest in rayon, and it established a rayon arm only shortly after the giant Japan Spinning established Japan Rayon. Kurashiki Spinning was also bolder (or perhaps merely less prudent) than either Oriental Spinning or Japan Spinning in its attempt to obtain rayon manufacturing technology by the cheaper method of self-development.

The reasons for the sluggishness of the spinning firms cannot lie in constraints on their behaviour, but must lie elsewhere. In the cases of Oriental Spinning, Japan Spinning and Osaka United Spinning, we do not have sufficient information to make a judgement on the causes of their tardiness. For the other companies, however, we can judge. The character of their management was the critical factor. Powerful individuals headed Kanegafuchi Spinning, Fuji Gas Spinning and Kurashiki Spinning. The President of Nisshin Spinning was less dominant, but nevertheless influential. These are the people who must have determined policy. Kanegafuchi Spinning and Fuji Gas Spinning were both dominated by figures who had extensive involvements outside of their firm's commitments and who were essentially uninterested in technology and industrial progress. At Nisshin Spinning, too, the Managing Director was a trader rather than an industrialist. Kurashiki Spinning's more aggressive attitude must be traced to the policies of Ōhara Magosaburō who, unlike his rivals, had a scientific outlook. Ōhara probably did more than anyone else to introduce the scientific study of social problems, especially those of labour, to Japan. His interest in technology was almost certainly a product of both his scientific outlook and his Christian ideals. The adoption of modern technology must have appealed to him, both as a matter of interest and as a means of promoting the welfare of his firm's work force and ultimately of Japanese labour in general.

We have traced the lack of enterprise of the spinning majors to the character of the dominant leaders. Yet, had there been a serious

conflict over policy between these leaders and other directors, these leaders could have been removed; they were by no means irreplaceable. We can only conclude that the boards of the textile majors were in substantial agreement with their presidents and managing directors. The outlook of the dominant figures, then, reflected a general climate of managerial opinion.

To this climate of opinion, the world in general and Japan in particular seemed to move at a slow pace. The foreseeable future would be much the same as the remembered Meiji past. There was no need to adopt difficult and risky foreign technologies hastily. Let them become safe and well-established and then act at leisure. The managerial life was comfortable. Let the people, whether leading technicians or labourers, be satisfied with the station in life allotted to them. Expansion and technological upgrading to satisfy the ambitions and needs of these lower orders was, in this managerial view, largely unnecessary.

In the twenties and especially the early twenties, all this seemed very reasonable and yet, as we shall see, powerful forces were already moving to blow this pleasant managerial world sky-high. The Suzuki Shoten was one notable component of these forces and, at the same time, perhaps their most appropriate symbol.

PUSSYFOOTS EXTRAORDINARY: THE TEXTILE COMPANIES

FOOTNOTES

[1]Kajinishi Mitsuhaya (ed.), Seni Jō (Vol. XI of Gendai Nihon Sangyō Hattatsu Shi. Tokyo: Tōkōryō, 1964), p. 527.

[2]Uchida Hoshimi, "Taishō: Shōwa Shoki no Kagaku Kōgyō ni Okeru Gijutsu Dōnyū to Jishu Kaihatsu: Kokusai Gijutsu Iten Katai to Shite Mita Kigyō Katsudō," Keiei Shigaku, 7:81, May, 1972.

[3]Kajinishi, loc. cit.

[4]Ibid., p. 528; and Uchida, op. cit., p. 81.

[5]Kajinishi, loc. cit.

[6]Ibid.

[7]Tōyō Bōseki Nanaju Nen Shi Henshu Iinkai, Tōyō Bōseki Nanaju Nen Shi (Osaka: Tōyō Bōseki K.K., 1953).

[8]Kajinishi, op. cit., p. 527; and Tōyō Bōseki, op. cit., p. 93.

[9]Kajinishi, loc. cit.

[10]Ibid., Table V-22, p. 562.

[11]Ibid., Appendix, pp. 42-43.

[12]Ginkō Kaisha Nenkan (Tokyo: Daiyamondo, 1928, 1929, 1930).

[13]Ibid.; Ginkō Kaisha Yōroku (Tokyo: Teikoku Kōshinjo, 1920, 1925, 1930); and Wada Hideyoshi (ed.), Bōseki Kontsuerun Tokuhon (Vol. XVI of Nihon Kontsuerun Zensho. Tokyo: Shunjūsha, 1937).

[14]Iwai Ryōtarō (ed.), Mitsubishi Kontsuerun Tokuhon (Vol. III of Nihon Kontsuerun Zensho. Tokyo: Shunjūsha, 1937), End paper diagram.

[15]Wada, op. cit., Appendix.

[16]Ibid., p. 67.

[17]Ibid., Appendix.

[18]Kajinishi, op. cit., Table IV-28, p. 381; Table IV-35, p. 389; Table IV-61, p. 425; and Table IV-67, p. 429.

[19]Seki Keizō, The Cotton Industry of Japan (Tokyo: Japan Society for the Promotion of Science, 1956), pp. 29-30.

[20]Kajinishi, op. cit., Table V-19, p. 559.

[21]Ibid., pp. 381, 425.

[22]Tokinotani Katsu (ed.), Nihon Kindai Shi Jiten (Tokyo: Tōyō Keizai Shimpōsha, 1958), p. 57.

[23]A. S. Pearse, The Cotton Industry of Japan and China (Manchester: Taylor, Garnett, Evans and Company, 1929), p. 156.

[24]Wada, op. cit., p. 293.

[25]Mutō Sanji, Mutō Sanji Zenshū (Tokyo: Shinjūsha, 1963).

[26]Wada, op. cit., p. 67.

B. THE RISING COMPANIES

CHAPTER IV

THE SUZUKI SHŌTEN: THE COMPANY WHICH GREW NOT WISELY BUT TOO WELL

I. OVERVIEW

The Suzuki Shōten was no ordinary combine. Though the firm has now been defunct for nearly fifty years, many in present-day Japanese business know of the company's daring in trade and its energy in the industrialization of new foreign technology. Indeed, the otherwise almost totally inexpressive faces of some Japanese businessmen light up when the name Suzuki is mentioned and they talk volubly, if not always accurately, about the history of the firm. What other long-bankrupt company has an association of old employees and relatives of the former owners, which not only meets regularly, but produces a magazine "Tatsumi" which appears several times a year. What other company is the hero in an historical detective "novel?"[1]

Suzuki's life blazed energy and daring. Its death was a brief and dramatic tragedy. The firm had grown not wisely, but too well; consequently it seems to have been marked for death by the establishment which it had so boldly challenged. It appears the establishment struck once to wound in 1918, waited its opportunity for nine years and then, aided by circumstance, struck one swift fatal blow, bankrupting the nation's third-ranking combine and one of the most aggressive business organizations which has ever existed.

Considering Suzuki's remarkable career and its considerable present-day reputation, factual source material is surprisingly meagre.

There is only one good full-length biography of the company's dynamic leader, Kaneko Naokichi, who was perhaps Japan's greatest entrepreneur.[2] Apart from this work, there is a collection of Kaneko's writings,[3] a rather sketchy biography of Kaneko and Matsukata[4] and the very well-researched "novel" by Shiroyama.[5] To supplement this, the researcher is driven to the rather meagre fare offered by journal articles and the general industrial histories.

This lack of information is due to a combination of factors. Firstly, the boom in the writing of company histories came with the flush of business success in the palmy days of the buoyant thirties. In the grey and struggling twenties, few company histories were written. By the time the boom of the thirties was fully fledged, Suzuki had already been defunct for a decade. Secondly, Kaneko's able young lieutenants, for example Takahata Seiichi, who might have had the leisure and desire to write, were themselves caught up in the unprecedented expansion of the boom years. They were too involved in their own, not inconsiderable exploits, to record the career of Kaneko. Thirdly, and perhaps most important, there is the personality of Kaneko himself. While he had ample leisure to write a history between the bankruptcy of the company in 1927 and his death in 1944, he shunned publicity of any kind and doubted his skill as a writer. He may well have dissuaded other Suzuki employees from writing a history of the firm.

II. SUZUKI'S DEVELOPMENT PRIOR TO WORLD WAR I

With the opening of Hyōgō, now the port of Kobe, to foreign trade, Matsubara Tsuneshichi founded a small company to deal in foreign sugar, silver, oil and bean waste. In 1877 this firm divided into two branches, the Ōsaka Tatsumiya and the Kobe Tatsumiya, the latter of which was formally known as the Kobe Tatsumiya Tatsu Suzuki Shōten.[6]

When Kaneko Naokichi started in the firm's Kobe office at the age of twenty in 1886, the company, still rather weak, dealt in sugar, oil and bean wastes.[7] Competition in sugar especially was severe and the company was forced to join the Overseas Sugar Trading Association. By the early 1890's, Suzuki's fortunes had improved and fully eighty per cent of its trade was external. The company now dealt in sugar, tea, fertilizers and camphor. Suzuki remained relatively minor, however; in 1894 the total value of its property was only about 90-100,000 yen--about average for a trading company at that period.[8]

In 1894 the master of the Suzuki Shōten, Suzuki Iwajirō, died, and only the initiative of his wife saved the firm from dissolution. Temporarily taking charge of affairs, she appointed Yanagida Fujimatsu overall manager and made Kaneko manager of the difficult sugar trade. From this time on, Kaneko seems to have been de facto controller of the firm. He was twenty-nine when Suzuki died and his remarkable ability had already won him recognition within the firm. The years between 1894 and the start of World War I were to see the Suzuki Shōten grow from a very average Kobe trading company to a small zaibatsu. These years were also to amply demonstrate Kaneko's brilliance, daring and

energy and also that difference of basic approach which was to be a partial cause of his conflict with Mitsui.

Soon after he assumed control, Kaneko received a lesson in the value of a global intelligence net which he was never to forget. At the end of the Sino-Japanese War (1894-95), with only the information available in Japan to guide him, he predicted a fall in the camphor price and he speculated in camphor futures accordingly. Unknown to Kaneko, a naval supplies contractor, Norse, was taking advantage of the disruption of camphor supplies caused by the Japanese occupation of the principal camphor producer, Taiwan, to corner the market. The price of camphor, contrary to Kaneko's expectations, rose steadily, and Suzuki sustained such severe losses that the firm hovered briefly on the edge of bankruptcy.[9]

In spite of this reverse, Kaneko was impressed by reports of the opportunity which existed in the Taiwan camphor trade and, undeterred by his initial failure, he rapidly built up an extensive business in that commodity. This trade was only possible due to the friendship he formed with Gotō Shimpei, then Chief Civil Administrator of Taiwan.

It is uncertain how Kaneko came to be acquainted with Goto, who was then one of the lesser oligarchs, though later he was to become a prominent member of the very powerful Yamagata Aritomo clique. Gotō was certainly linked with the younger Tosa party politicans like Hamaguchi, and he may have known the much more senior Tosa politician, Itagaki Taisuke, who played a major role in the Peoples' Rights Movement of the 1880's. Han loyalties remained strong until the thirties and, even in contemporary

Japan, they are still important. It was probably one of the Tosa politicians who introduced Kaneko to Gotō. Each must have been impressed by the ability of the other.

The friendship between Gotō and Kaneko, which was to be of long-standing, was of great benefit to both. Through the relationship, Kaneko gained a considerable share of the Taiwan camphor trade, very necessary permanent political protection within Japan, and an enduring financial link with the large, prestigious and semi-official Bank of Taiwan. When the Government-General of Taiwan established the Taiwan Camphor and Camphor Oil Monopoly in 1899, Suzuki secured no less than sixty-five per cent of the camphor oil trade.[10] Through the success of Suzuki, Gotō obtained a major source of funds which was to support him throughout his political career.[11]

In 1902 the legal form of Suzuki was changed from an individually owned enterprise to an unlimited partnership. This form was to last until 1923. The firm in 1902 had a capitalization of 500,000 yen, indicating that it had grown five times since 1894.[12]

In 1900, under Kaneko's able and energetic direction, the firm took its first tentative steps in two areas where it was later to earn fame and engender fear. Suzuki's first industrial enterprise was the establishment of a small camphor refinery in Kobe, which was followed in 1902 by a peppermint plant in the same city. Suzuki moved into world, as distinct from oriental, trade with the founding of the London office to handle trade with the West.[13]

Suzuki expanded steadily in industry[14] (Table XIX). In spite of the opposition of the Seiyūkai and its shadowy backer Mitsui, the firm aided by Gotō Shimpei made its first large-scale venture into industry in 1903 with the founding of Dairi Sugar Refining.[15] Five short years later in 1908, Suzuki sold this venture to Japan Sugar Refining on very favourable terms. There was a cash settlement of 6,500,000 yen and Suzuki received the right to market Japan Sugar Refining's product in Hokkaido, Korea and much of Honshu west of Kyoto. Suzuki made an immediate profit of five million yen, which greatly strengthened the firm's financial base. With this sale, the Kobe trader, for the first time, achieved fame in the Japanese commercial world.[16] By 1909 Suzuki was operating no less than six industrial enterprises in Kobe, which included three camphor plants, one fish oil and one peppermint factory, together with the then rather unsuccessful Kobe Steel Works.[17]

Suzuki continued to be active in trade and, to a minor degree, in finance[18] (Table XX, page). In 1909, Kaneko, in a bold move to broaden the company's world trading activities, established the Japan Trading Company, in cooperation with an experienced German trader.[19] The German became President and, under his guidance, the new firm set up a number of trade routes and dealt in several commodities where Suzuki had had no previous experience. At first the new trading venture prospered, but later, due to differences of viewpoint between the President and the Japanese staff, profits declined and Suzuki took full control.[20] Suzuki was now handling cotton, copper and paper, in

TABLE XIX

THE SUZUKI GROUP PRIOR TO WORLD WAR I:
INDUSTRIAL FIRMS

Company	Date established as a Suzuki subsidiary	Paid-up capical (1,000 yen)
Tenman Woven Products	?	5,243
Japan Cement	?	5,000
Japan Flour Mills	?	12,300
Japan Salt Industries	September 1903	3,802
Kobe Steel	September 1905	20,000
East Asia Flour Mills	October 1906	1,250
East Asia Tobacco	November 1906	5,800
Tokyo Wool Products	November 1906	16,000
Japan Brewing	December 1906	2,150
Eastern Industries	January 1907	500
Oriental Sugar Refining	February 1907	22,030
Shiomizu Harbour Sugar Refining	March 1907	21,563
Imperial Beer	May 1912	5,500
Total		121,138

TABLE XX

THE SUZUKI GROUP PRIOR TO WORLD WAR I:
NON-INDUSTRIAL FIRMS

Company	Date established as a Suzuki subsidiary	Paid-up capital (1,000 yen)
Sixty-fifth Bank	?	6,250
Japan Education & Life Insurance	?	75
Oriental Marine & Fire Insurance	June 1908	750
Japan Trading	February 1909	5,000
South Manchuria Trading	January 1913	1,000
Taishō Life Insurance	April 1913	125
Total		13,200

addition to the previous staples of sugar, camphor and peppermint. As the volume of trade had greatly increased, it now became profitable for Suzuki to establish a shipping arm. In 1913 South Manchuria Trading, a wholly owned subsidiary, was set up with an initial fleet of three ships of about five thousand tons each.[21] By the beginning of the war Suzuki had four finance-related ventures, though these were small.

Thus, by 1913, Kaneko had initiated a move into industry and was dealing on the world market in a moderate range of commodities. By this time Suzuki's shipping line had moved into the carrying trade besides handling Japanese trade.[22] Suzuki was, thus, already a small trade-centred zaibatsu, reasonably diversified in industry, and financed by the very loosely associated Bank of Taiwan.

In 1913 Kaneko took a step which was almost to rank in importance with the formation of the link with Gotō. In that year, Kaneko, sensing the imminence of rapid change in the world situation, began to place a greatly increased emphasis on intelligence. Utilizing existing trade offices and establishing others, he set up a world-wide net of listening posts, which included Western Europe, North America, Russia, China and Australia. By November 1913 Kaneko is said to have forecast the coming of World War I and the beneficial influence it would have on Japanese industry.[23]

On the eve of World War I, the Suzuki Shōten, though only a small zaibatsu, was singularly well-equipped to profit from the war. The combine, which was highly trade-oriented, had an established intelligence network and at the centre of this network was a genius

at interpretation.

III. WORLD WAR I: EXPLOSION

With the onset of the war, Kaneko's intelligence network proved invaluable. The network did not simply collect data relating immediately to commerce, but picked up information of any type which might relate, however indirectly, to the future course of trade. Particular stress was given to political and military information in Europe. At Suzuki's Head Office in Kobe, there was no pre-screening of the information received from the branch offices abroad. The telegraph boys came straight from the telegraph station and delivered their telegrams direct to Kaneko himself, who personally interpreted all information. Thanks to the intelligence net and his own interpretive skill, Kaneko early forecast the wartime shortages. By 1914 Suzuki was buying up iron and shipping in quantity, in spite of the derision of most of Kaneko's rivals, who considered him mad. To the astonishment of informed opinion in Japan which forecast a short war, he ordered three 10,000 ton ships from Mitsubishi Shipyards. Kaneko was amply vindicated when prices commenced to rise sharply in February and March 1915. Kaneko was not entirely alone in his foresight. Matsukata Kōjirō of Kawasaki Shipyards planned to build nearly 100,000 tons of shipping--an enormous tonnage for those days--and he requested that Suzuki supply most of the iron. The Kobe trader made a considerable profit from this deal and from the sales of large quantities of iron for shipbuilding to Mitsubishi, Ishikawajima and Osaka Foundries. Suzuki also supplied its own Harima

and Toba Shipyards.[24]

The wide range of information sought by Kaneko through his intelligence net and the enormous scope of Suzuki's activities by the third year of World War I are well shown by a letter written by Kaneko to Takahata Seiichi of the London office in 1917.[25] Kaneko sought to ascertain opinion in Europe on the length of the war, the duration of the shipping boom and the probable course of the shipping industry after the war. He was also interested in the wartime and postwar markets for soya beans, soya bean oil, fish oil, camphor, peppermint, copper, tin, zinc, lead and other commodities. Kaneko expressed concern over the supply of iron (essential for shipbuilding) in the U.K. and the U.S. during and after the war and enquired about trends in labour and shipbuilding costs. Considerable fear had arisen in Japan that, were the war to be greatly prolonged, the U.K. would move to issue inconvertible paper currency, and Kaneko wished to be informed if the U.K. seemed likely to make such an issue. Suzuki had recently started metal refining, using lead and zinc ores from Russia and Australia, and Kaneko requested Takahata to obtain information on refining in London. The Kobe trader had obtained orders for explosive shells from Russia and Kaneko pressed Takahata to attempt to get similar orders from France.

Suzuki's trade grew to an extent unparallelled by any other company in Japan. During 1917 the firm handled goods valued at 1,540,000,000 yen and thus came to outstrip Mitsui Bussan which for long had dominated the Japanese trading world.[26] By the end of the war, Suzuki had become one of a select group of six trading companies which

handled the sales of the government-operated Yahata Iron Works. By the end of the war, too, Suzuki was importing steel from the world's leading companies and had become a central supplier of steel, not only to the private railways but to the prestigious Railway Bureau itself.[27]

The expansion of the number of subsidiaries was also startling[28] (see Tables XXI and XXII). Prior to the war, there had been nineteen companies with a total paid-up capital of 134,338,000 yen under the Suzuki umbrella, but by the end of the war boom in early 1920 there were fully fifty-three with a paid-up capital of 335,828,000 yen. In fact, in six years, the aggregate paid-up capital of the Suzuki group had increased over fifty per cent in real terms. The increase in size of Suzuki was, in fact, much greater than this, as most of the subsidiaries established prior to the war had increased greatly in size due to the war demand and Kaneko's energetic leadership.

By 1919, Suzuki had achieved a level of diversity in industrial activity which was equalled only by the Great Zaibatsu themselves and had been attained by them over a much longer period of development. The combine was now active in the older staple industries like coal mining, iron and steel, shipbuilding, cotton and wool textiles, and food processing. In the newer industrial fields it was showing greater aggression than the Great Zaibatsu in developing the new chemical industries, having ventures on some scale in rayon and celluloid, while on a lesser scale the company had developed the manufacture of drugs and synthetic dyes. In the new branches of engineering, too, Kaneko was active. The diesel engine and high-pressure gas equipment for submarine use were developed at Kobe Steel.

TABLE XXI

THE SUZUKI GROUP--AUGUST 1914 TO DECEMBER 1919:
INDUSTRIAL FIRMS

Company	Date established as a Suzuki subsidiary	Paid up capital (1,000 yen)
Giran Industries	March 1915	475
Sanyō Ironworks	December 1915	500
Okimimoto Collieries	March 1916	2,000
Korean Railways	April 1916	17,650
Japan Metals	May 1916	1,000
Japan Explosives Manufacturing	June 1916	1,375
Yaezan Industries	August 1916	112
Oriental Match	September 1916	2,800
Imperial Dyestuff Manufacturing	November 1916	555
Fukushima Collieries	December 1916	1,200
Saga Spinning	December 1916	3,500
Tōkai Oil Refinery	June 1917	125
Kanmon Pottery	August 1917	190
South-East Asia Sugar Refining	November 1917	1,250

TABLE XXI (CONTINUED)

Company	Date established as a Suzuki subsidiary	Paid up capital (1,000 yen)
Imperial Match	January 1918	200
Hikoshima Crucibles	February 1918	300
Japan Camphor	February 1918	6,750
Imperial Rayon	February 1918	8,750
Sanyō Hydro-electric	September 1918	4,500
Japan Metallurgy	March 1919	350
Shinetsu Electric	May 1919	32,000
Imperial Coal Industries	May 1919	10,000
Japan Celluloid	September 1919	10,000
Taisei Chemicals	October 1919	500
Homeland Foodstuffs	October 1919	60
Sun Soda	October 1919	500
Mikuni Spinning	October 1919	2,500
Refined Camphor	December 1919	1,700
Total		110,842

TABLE XXII

THE SUZUKI GROUP--AUGUST 1914 TO DECEMBER 1919:
NON-INDUSTRIAL FIRMS

Company	Date established as a Suzuki subsidiary	Paid up capital (1,000 yen)
Imperial Steamships	October 1916	1,000
Rōka Warehousing	June 1917	5,000
Hisa Trading	December 1917	2,000
Chiyoda Trust	October 1918	2,500
International Steamships	July 1919	77,148
Japan Colonization	November 1919	3,000
Total		90,648

TABLE XXIII

THE SUZUKI GROUP--JANUARY 1920 TO APRIL 1927:
INDUSTRIAL FIRMS

Company	Date established as a Suzuki subsidiary	Paid up capital (1,000 yen)
China Camphor	December 1920	2,000
Sakhalin Fish Industries	December 1920	600
Asahi Oil	February 1921	9,300
United Fats & Glycerine	April 1921	5,000
Otagawa Hydro-electric	October 1921	750
Japan Trawling	October 1921	1,000
Hōnen Oil Refining	April 1922	10,000
Claude Process Nitrogen Industries	April 1922	10,000
South Korea Paper Mills	May 1922	1,000
Continental Lumber Industries	June 1922	750
Tokyo Radio Electric	October 1922	250
Imperial Camphor	December 1922	1,000
Japan Bicycles	March 1924	600

TABLE XXIII (CONTINUED)

Company	Date established as a Suzuki subsidiary	Paid up capital (1,000 yen)
Sanyō Electric Railways	July 1924	450
All Japan Brewing	March 1925	2,865
Japan Airbrake	March 1925	450
Spinning Machine Manufacturing	May 1925	200
Total		46,215

TABLE XXIV

THE SUZUKI GROUP--JANUARY 1920 TO APRIL 1927:
NON-INDUSTRIAL FIRMS

Company	Date established as a Suzuki subsidiary	Paid up capital (1,000 yen)
New Japan Fire & Marine Insurance	August 1920	1,250
Yoneboshi Tobacco	December 1921	500
Chōfū Land	December 1925	375
Total		2,125
Subsidiaries - Grand Total		384,168

NOTE: Only subsidiaries existing at the time of the bankruptcy of the Suzuki Shōten in 1927 are recorded on these tables. With two minor exceptions, all of the firms listed on Tables XIX-XXIV were firmly held by Suzuki. They were either branch companies, direct subsidiaries, or firms in which Suzuki held all or the majority of the stock. East Asia Flour Mills (Table XIX) and Taisei Chemicals (Table XXI) were closely affiliated though not under Suzuki control.

Suzuki had interests in fields where the Great Zaibatsu were unrepresented like its massive investments in railways and hydro-electric power generation. Nor had Kaneko neglected finance and finance-related fields. While Suzuki's banking subsidiary, the 65th Bank, was small, the combine had the full support of the Bank of Taiwan, and Kaneko had developed insurance before the Great Zaibatsu themselves became seriously interested in the field.

Prior to World War I, Suzuki had been a small zaibatsu, but by the end of the war it was coming to rival the largest of the major zaibatsu. No direct comparison can be made of the relative size of Suzuki and the leading zaibatsu in 1919, as no figures are available for the latter. We can, however, compare them very roughly in 1927-28, using the aggregate paid up capital of the subsidiaries as the best available criterion. In 1927, the aggregate paid-up capital of the Suzuki group was 384,168,000 yen,[29] while in 1928 the paid up capital of the firms comprising the leading zaibatsu were as follows: Mitsui, 1,644,374,000; Mitsubishi, 712,943,000; Sumitomo, 243,767,000; Yasuda, 308,237,000; and Kawasaki, 115,062,000[30] (Table XXV).

There can be no doubt that Suzuki was actually relatively larger in 1927 than the above figures would suggest. The Suzuki Shōten, itself, the combine's main trading arm, is not included in the aggregate and a considerable addition should be made for the Bank of Taiwan, which although not a subsidiary of Suzuki was very closely related to the combine. Neither of these factors can be quantified. Suzuki at the end of the war was probably about the same size relative to the major

TABLE XXV

THE FIVE LEADING ZAIBATSU IN 1928

Zaibatsu	(1) Capitalization of main co.*	(2) Deposits of bank of combine*	(3) Deposits of trust co. of combine*	(4) Reserves of insurance co. of combine*	(5) Total of 2+3+4*	(6) Paid up capital of banks & co.s controlled*	(7) % of total of 2+3+4 for all 5 zaibatsu†	(8) % of paid up capital for all 5 zaibatsu†
Mitsui	700,000	605,610	364,948	6,983	977,577	1,644,374	20.0	54.4
Mitsubishi	500,000	614,071	121,894	179,549	915,518	712,943	18.8	23.6
Sumitomo	200,000	666,655	184,709	9,450	860,814	243,767	17.6	8.0
Yasuda	60,000	1,137,139	224,128	66,191	1,427,558	308,237	29.3	10.2
Kawasaki	20,000	601,690	21,909	75,308	699,197	115,062	14.3	3.8

*In columns 1-6 all figures in thousands of yen

†Columns 7 and 8 each total 100%

NOTE: The most reliable index of combine size would be the relative size of the sum of the fixed capital plus fluid reserves of the constituent companies for each combine. This figure is not available and the nearest approximation to it is the sum of the paid up capital of the constituent companies of the combine. Thus, column 8 in the table above is the best available index of the relative size of the five zaibatsu in 1928.

zaibatsu as it was in 1927. While the combine expanded rapidly for a short period in the early 1920's, it grew little after the end of 1922. The major zaibatsu expanded slowly but continuously from the end of the war to 1927.

Using the raw figures for 1927-28, Suzuki would appear at the end of the war to have been Japan's third-ranking combine. It was considerably larger than Yasuda, but only slightly more than half the size of Mitsubishi. If a correction is made for the Suzuki Shōten itself and the Bank of Taiwan, then the true size of Suzuki might not have been very much less than that of Mitsubishi.

By the end of 1919, Suzuki had risen from a rather small base at the start of the war to rank as a close rival of the two Great Zaibatsu themselves in overall size and diversity of industrial activity. Under war boom conditions the rate of development of the combine was without parallel in the Japanese economy.

IV. THE FETTERED GIANT: SUZUKI 1920-1927

While there is surprisingly little information on the activities of the Suzuki Shōten prior to 1919, we know very much less about the development of the firm between the postwar slump of 1920 and its bankruptcy in 1927. In much of this period the company was in great difficulties and perhaps for this reason all sources treat the period only in barest outline.

At the end of World War I and in the immediate postwar period Suzuki surmounted a period of acute crisis caused by disorganization, due

to the burning of key documents at the company's head office during the Rice Riots of 1918 (see page 313)and a precipitous decline in the demand for shipping with the collapse of the war boom. In the brief boom of 1920 to 1921 the firm prospered, due to Kaneko's aggressive policy and skilfull use of his intelligence net. Suzuki secured a lucrative carrying trade in wheat from Manchuria to famine-stricken Europe, which lasted for about a year. The company used no fewer than forty-five ships of capacity between eight and ten thousand tons.[31]

For a period in 1921 to 1922, Kaneko resumed the expansion of Suzuki at a tempo which equalled that of the prewar days, if not that of the war boom. The intelligence net was considerably expanded between 1918 and 1923, and it is probable that most of this expansion took place during 1921 and 1922, as the preceding two years, as we have seen, were marked by disorganization. Thus, it is probable that most of the following offices abroad were established in 1921 and 1922: Tsinan, Hankow, Amoy, Foochow, Hong Kong, Singapore, Calcutta, Portland, Manila, Seattle, Valparaiso, Melbourne, Hamburg, Houston, San Francisco and Fort Worth.[32] In spite of the continuing depression of the Japanese economy and trading profits in 1921 and 1922, eleven new enterprises were added to the Suzuki group with an aggregate paid-up capital of 39,550,000 yen[33] (Tables XXIII and XXIV, pages 182 and 184). This was in marked contrast to the Great Zaibatsu which expanded little in the adverse circumstances of the early 1920's.

In 1923 the expansion virtually ended. This was almost certainly due to a lack of funds for investment. We have no figures for Suzuki's

trade or for the financial state of its subsidiaries, but indirect evidence strongly indicates that the company after 1920 suffered greatly reduced profits or losses. According to a contemporary observer, Suzuki and the Bank of Taiwan both suffered losses between December 1924 and December 1926, due to the progressive decline in commodity prices.[34] We do have figures for the trading profits of Mitsui and Mitsubishi throughout the twenties and there would certainly be a parallel between these and those of the Suzuki Shōten. The trading profits of Mitsui Bussan were extremely depressed in the early twenties, while Mitsubishi Shōji's profits were very depressed throughout the twenties (see Table V, page 32). In the adverse business conditions of the early and mid-twenties, few of Suzuki's subsidiaries (which were mostly newly established) were profitable.

Nowhere is the difference in spirit between Kaneko and the leaders of the Great Zaibatsu and the textile firms more clearly displayed than in their differing reactions to the conditions of the early and mid-twenties. Kaneko, although confronted with greatly reduced funds for investment, vigorously resumed the expansion of Suzuki once the sharp postwar recession was over. He was in fact over-bold, as in the adverse conditions of the twenties the firm was already over-extended. Mitsui and Mitsubishi, as we have seen, though they had ample resources, adopted an almost entirely defensive stand. The contrast with the textile firms was even greater. Possessed of a plentiful and secure source of fresh funds and vast existing reserves, these companies showed little or no interest in the diversification of their very narrow

industrial bases.

Let us now turn from a general examination of Suzuki's progress and consider in depth its striking record in rayon and ammonia synthesis.

V. SUZUKI IN RAYON

Introduction

In rayon many of the differences of approach between Suzuki and established capital are thrown into startling relief. By far the most striking feature of Suzuki's activity in rayon was Kaneko's bold, energetic and skilful move to industrialize the as yet rather rudimentary rayon technology in 1918, when the Hiroshima Plant was planned. This stood in marked contrast to the timidity and sluggishness of established capital. Less important, but nonetheless noteworthy, was Kaneko's encouragement of rayon research during World War I, when success seemed unlikely. Established capital would not have wished to be identified with such an unprestigious and dubious venture. The third difference was Kaneko's totally unabashed and highly successful employment of industrial espionage. This was a tactic little if at all used by the established companies in the period from the start of World War I to the early thirties. Suzuki's rayon venture was remarkable too for the dogged persistence and great skill shown by the technicians.

Suzuki's rayon venture grew from the most unpromising beginnings to become one of the greatest successes in Japanese industrial history. Imperial Rayon, the company which Suzuki founded, was to long outlive its parent, and today it is one of the very largest and most active of the

chemical companies in Japan. Let us now consider the earlier history of the firm in some detail.

Kaneko had a deep and sustained interest in rayon long before the move to establish Japan's first large-scale rayon plant in 1918. His interest, which commenced when he saw the first sample of rayon to reach Japan in 1892, never flagged, and he gradually built up an outline knowledge of the industry as it existed in the West. In 1905, Kaneko, seeking to broaden Suzuki's industrial base, despatched Matsuda Shigetarō to Europe to investigate the celluloid and rayon industries.[35] Between 1906 and 1910, Suzuki participated with Mitsubishi and other Japanese firms in a joint venture to establish a combined celluloid and rayon plant, but the technological base was entirely inadequate and the project was a commercial failure. In the course of the work, however, Kaneko increased his knowledge of the industry and gained further information through a collection of patents by a government engineer serving in Europe. By 1910, Kaneko had a very clear idea of the nature and scale of the rayon industry in the West and he determined to introduce the industry into Japan.[36]

Kaneko's ambition in rayon probably stemmed from his perception of the pattern of evolution of contemporary industry. He saw three main trends. Firstly, the gradual substitution of natural by artificial fibres in clothing manufacture. Secondly, the evolution of more powerful engines, especially the diesel, and thirdly, the increasing use of artificial fertilizers. Kaneko was to establish enterprises in each of these fields.[37] It is said that Kaneko, who had suffered bitterly from poverty and consequent social ostracism, wished to diminish blatant

social distinctions and that he saw in rayon a means to do this. Natural silk vividly symbolized the difference between rich and poor, as each silk garment which only the privileged few could afford required the labour of many poor workers. Rayon, in contrast, was cheap and could be afforded by all but the very poorest. Part of Kaneko's motivation to establish the rayon industry may have been a wish to promote a more egalitarian Japan.

Early Experimentation

Only a very crude process for viscose rayon was developed in the period 1914-1918. This rudimentary rayon technology was developed slowly and painfully by two young graduates of the Department of Applied Chemistry of Tokyo Imperial University: Kumura Seita and Hata Itsuzō. Kumura, who was for long employed by the Suzuki subsidiary Tokyo Leather, came to the attention of Kaneko through his successful research on a substance to give lustre to leather. By 1908, Kumura had experimented unsuccessfully at an elementary level to find uses for viscose.[38] Hata, who was also interested in viscose, became acquainted with Kumura in 1911. In the following year he took up a position as lecturer in applied chemistry at the Yonezawa Technical College and commenced to research a process for viscose rayon. By October 1913, he could produce a thread, though it was of poor lustre and lacked elasticity and strength.[39]

Kaneko, who became aware of Hata's research at Yonezawa through Kumura in 1914, was sufficiently impressed to back further research, commencing with an initial payment of 1,000 yen.[40] While this payment

was fairly generous, until the project showed very definite promise of success in 1918 Kaneko was niggardly in funding, though he invested much of his very considerable managerial skill in the project. He undoubtedly regarded the venture as a long shot, which while of considerable personal interest to him did not merit the risk of a great deal of Suzuki's money. Suzuki at this period certainly did not lack for funds, as shown by the rapid increase of its subsidiaries. The project may well have been something of a hobby to Kaneko.

Hata and Kumura made an excellent team. While many of the ideas were supplied by the erratic and somewhat lazy Kumura, Hata carried out almost all of the experimentation.[41] Hata worked with a tireless dedication, and Kumura devoted considerable time to the project, though his main duties were still at Tokyo Leather. The chief limitation of the Hata-Kumura team was language. Most of the source material was in Western languages, which neither could really read. In the texts the essential processes of cellulose aging and viscose maturation were clearly explained, but the two researchers could not understand them.[42] For this reason, progress was extremely show. Why did they not use a translator? The technical texts would at first have baffled almost any translator in Japan, but with time the problem could have been overcome. The most likely answer is that neither of the researchers would admit they could not understand the texts. Their dogged efforts under such a limitation says much for their determination, if not for their sense of humility.

Throughout the research Kaneko displayed great managerial skill. He stayed in close contact with the course of research at Yonezawa Technical College. His continued attention to this rather long shot affords ample evidence of his vast energy and inexhaustible patience in business matters. He continually praised the two technicians, never blaming them for failure, even when progress was very slow. Kaneko skilfully guided and forced the pace of development. When the researchers appeared to be forgetting that the object of their research was the production of a thread salable on the Japanese market, he called for costs to be kept of thread production from their primitive equipment.[43] His basic thrust was to set up the rayon venture on a commercial basis as soon as possible. By doing this he forced the pace of research and made the research venture pay at least a considerable fraction of its costs. When in thespring of 1915 Kaneko decided, in the face of the opposition of Hata and even the normally very sanguine Kumura, to establish a small-scale rayon plant in Yonezawa City distinct from the university laboratory, the researchers were placed under great pressure to evolve adequate technology. When the plant went into operation, this pressure to cut costs to meet the break-even target must have added greatly to the efficiency of the operation. The new plant and research venture was known as the Tokyo Leather Branch Factory: The Yonezawa Rayon Manufacturing Plant.[44] While Kaneko remained firm that the operation must be considered as a commercial venture, he continued to encourage Hata and Kumura throughout the long period of losses that followed.

The plant would have been very unimpressive to a contemporary

technical Western observer and would have been regarded with amused contempt by any of the leaders of the Great Zaibatsu. By May 1916, ten thread-producing machines with a total of forty spindles were operated by a work force of nine men and ten women under Hata's direction. The inadequacy of funding was clearly shown by the primitive nature of the equipment. Wooden cogs were used in the spinning machines and bicycle pumps functioned in place of spinning pumps. The quality of the thread was still abysmally low. C. F. Cross (with Bevan, one of the inventors of the viscose process) evaluated a sample of thread sent to him as "Very, very inferior" and Toyoshima Trading of Osaka offered only eighty sen per pound for the thread against a cost price at Yonezawa of ten yen per pound.[45]

Until late in 1916, good quality thread was still only made by accident. The Hata-Kumura team, indefatigable as they were, had never understood the basics of the viscose process. They were not only ignorant of the necessity of cellulose aging and viscose maturation, but also of the existence of different types of cellulose and of the availability of superior foreign pulp.[46] In late 1916, however, due to a lucky accident, the time of preparation of the viscose was altered, so that almost the correct degree of maturation took place. The thread now had a good lustre, though it was still of poor elasticity.[47]

Development

Kaneko now decided to establish a large-scale rayon plant at Hiroshima. This was a bold decision. It was a pioneering move, as there was no rayon plant in Japan of any scale; the Yonezawa Plant and

research station was by far the biggest organization connected with rayon production in Japan. Neither did any other company even plan a full-scale plant until 1922, when Noguchi moved to set up Asahi Silk Weaving. Then, too, as we have seen, at Yonezawa technology was still rather poorly established. Kaneko must have been well aware of this as, although the correct degree of maturation of the viscose had been accidentally attained, there was little control over thread elasticity and thread diameter control remained an unsolved problem. There was also the problem of reducing costs to meet postwar foreign competition. Though the stake was now much greater, Kaneko's tactics were the same as those he had so successfully employed throughout the development at Yonezawa; gamble, guide and force the pace.

Kaneko gambled that, while technology presently was inadequate, it could be made adequate in the near future. He was right; a sufficient technological level had been attained to allow the establishment of the plant. Kaneko did not gamble wildly. He undoubtedly reviewed all the information available to him, decided on the most probable interpretation and, as the probability of success appeared high, decided to go ahead. Kaneko must have known in 1917, through his intelligence system, that knowledge of rayon technology was now starting to become available in the West and felt that the Yonezawa experience had given the researchers sufficient grasp of the viscose process to assimilate and transplant this knowledge to Japan. In trade Kaneko's genius lay in his uncanny ability to interpret political and economic trends and to accurately forecast future developments. In industrialization, Kaneko's main forte was

perhaps his intuitive grasp of the stage reached in the development of a project.

Kaneko guided. He determined to send Kumura to make a reconnaissance of the rayon industry in the West at about the same time—the late winter of 1917 to 1918—that he must have decided on the Hiroshima rayon plant project. Hata had already made such a reconnaissance between November 1916 and March 1918, but he had brought back little information. He had failed due to his deficiency in language, his inability to socialize with Westerners, and the tight secrecy of the rayon producers in most areas of the West. Kaneko undoubtedly made a mistake in the despatch of Hata who was totally unfit for the task.

If Kaneko had been wrong about Hata, he certainly picked exactly the right man for the job and the occasion when he sent Kumura abroad in the early spring of 1918. Kumura was to do brilliant work as an industrial spy. The lacrimose, self-pitying Hata at the end of his trip tearfully concluded that the closest he had got to rayon in Europe was a few threads of the textile on some workmen's jackets in a restaurant near a rayon plant. Kumura, with a tough buoyant optimism which Kaneko himself might well have envied, skilfully extracted the essential technological secrets which were to underpin the success of the Hiroshima Plant. Kumura possessed, to a marked degree, that combination of indefatigable spirit and technical competence which was the hallmark of much of the Japanese technical class. Kumura tried a variety of tactics, probably almost simultaneously. In spite of the tremendous handicaps presented by his inadequate English—he couldn't even read

technical English in his own field--and his extremely Japanese personality, Kumura boldly sought knowledge of rayon technology by attempting to obtain employment in an American rayon plant. His failure to do so was entirely due to the vigilance of the rayon companies against foreign spies.[48]

Kumura tried a more indirect approach. He searched the U.S. for a machinery manufacturer who built rayon production equipment. For reasons of secrecy, the rayon companies built almost all their own machinery and it was only after some time that he was able to buy a plan of the dryer used at American Viscose through a Philadelphia manufacturer.

While in America Kumura visited Edward Walden, the author of The Chemistry of Cellulose Esters. While Walden was useful in explaining general theory to Kumura, he could give no practical guidance on the manufacture of viscose on an industrial scale, as he himself had no experience in industry.[49]

These tactics were unsuccessful, but another approach was to be much more fruitful. The plant of the viscose rayon producer National Rayon was shut down in 1918 due to a dispute among the shareholders, to technical deficiencies of the plant, and to a shortage of funds. National Rayon does not appear to have been connected to the First Rayon Cartel, which had had a monopoly of the technology of viscose rayon manufacture, and it is probable that the technical deficiencies at National Rayon were due to the fact that the technology had been illicitly obtained and that there were some gaps in the knowledge for this reason.

Probably due to the lack of connection with the First Rayon Cartel, National Rayon's control of information leakages was much less tight than that of the companies which comprised the cartel. This, however, was not to be apparent to Kumura at first.

Kumura approached a certain Boluchikorski, the manager of National Rayon. Boluchikorski attempted to negotiate a loan of $1,800,000 from the Suzuki Shōten without even allowing Kumura to view the plant, but Kumura was not the man to easily acquiesce to such a proposition and insisted on an examination before further negotiations. Boluchikorski then offered an examination of the plant for $100,000, which Kumura, not surprisingly, refused.[50]

Kumura now tried more indirect, not to say underhand, methods. He struck up a friendship with a young engineer at National Rayon called Stebbin and had persuaded him to go to Japan, when he suddenly died from the then prevalent Spanish influenza. Before he died, however, he handed over, free, a complete plan of National Rayon's plant, which was to prove invaluable to Suzuki as the basis of the plan for the plant at Hiroshima.

Merely by the possession of Stebbin's plan, Kumura had made a great advance. Two pieces of vital information were apparent from the plan. Firstly, that the alkali cellulose should be aged at a fixed temperature and, secondly, that the viscose after manufacture required a certain period to reach maturity. On Stebbin's plan, each viscose tank was clearly marked with the time the viscose had been stored, and the temperature for the maturing of the viscose was marked at $16^{\circ}C \pm \frac{1}{2}^{\circ}$.[51]

Kaneko had already been proved right. Rayon technology was now much more readily available in the West! He was to be further vindicated.

Kumura was now aided by a stroke of luck. National Rayon went bankrupt and the whole plant was put up for sale.[52] The existing rayon producers made no attempt to buy up the equipment to maintain secrecy. This confirms what the existence of National Rayon itself strongly indicated--that there had been considerable leakages of information by the end of World War I of viscose rayon technology. With the bankruptcy, Kumura could obtain the inspection for which Boluchikorski had asked $100,000 merely by making an application to inspect the equipment as a potential buyer.

This inspection provided further invaluable information. Firstly, that thread thickness was controlled by gear pumps, fitted at each orifice of the viscose chamber, which supplied the spinning machines. Secondly, the constant size of the aperture of each orifice was maintained throughout a long period of operation by a platinum cap, which was highly resistant to corrosion.[53] Kumura gladly made out an order for the best equipment at prices of only about a third of those paid by National Rayon.

Boluchikorski, understandably annoyed at the activities of this audacious and resourceful Japanese, appealed in a court at Cleveland, Ohio, petitioning that Kumura's actions were in contravention of the "Preservation of Business Secrets Act." Kumura, undaunted, and anxious to obtain the equipment he had ordered characteristically stood his

ground. To his amazement, the court did not allow the action, ruling that the law applied to U.S. companies only and that Kumura had entered the plant as a lawful buyer. Boluchikorski, also not easily defeated, appealed to the Suzuki Shōten, asking that it abide by the law of the country, but the New York office, with a facile evasiveness which was a Suzuki characteristic, blandly replied that Kumura was not a Suzuki employee.[54]

Kumura had acquired more than sufficient information to make the Hiroshima Plant a technological success. Kaneko's judgement had been fully vindicated. Kumura's experience at Yonezawa had equipped him to function very effectively as an industrial spy in rayon,and rayon technology, too, had become more readily available in the West by the latter part of World War I. The next three years were to show that Kaneko was also correct in his assumption that the technology could be transplanted to Japan, as Kumura and Hata were able to establish the Hiroshima Plant, though only with considerable effort.

We have said that Kaneko's tactics may be summarized by the phrase "gamble, guide and force the pace." We have described the nature of his gamble and the way in which he guided the preparatory work to establish the Hiroshima Plant. We now have to discuss how he forced the pace at Hiroshima.

Kaneko pressured all personnel in the rayon enterprise and especially the technicians by incorporating the subsidiary Imperial Rayon at a very early date--May 1, 1918. He undoubtedly thought that the founding of a new organization would make the establishment of the

Hiroshima Plant a much more tangible goal and thus greatly increase the work pace of the technicians.

Kaneko did not set a date for the completion of the Hiroshima Plant until the autumn of 1919. Many technical problems remained. While the chemical problems of viscose production had been largely overcome, the complexities of rayon spinning were far from mastered. The reasons for this were two-fold. Firstly, National Rayon's spinning technology was not of the same calibre as that of the members of the First Rayon Cartel. Secondly, Kumura was basically a chemist who had very much less appreciation of the mechanics of spinning than he had of chemistry. This would not have mattered so much had the equipment, which Kumura had ordered from National Rayon, been purchased as planned. Due to the confusion of Suzuki's affairs after the burning of the Head Office during the Rice Riots in Kobe, the equipment could not be paid for immediately and, by the time the funds were available, Boluchikorski had sold to another buyer. The technology utilized at the Hiroshima Plant came to be based on the Yonezawa experience, the information collected by Kumura, the fruits of further spying abroad, and the purchase of foreign equipment which served as models for duplication. The establishment of the plant was to be a tremendous task.

Kumura had been unfavourably impressed by the fluffy thread produced at National Rayon by the parallel bobbin spinning method and he also lacked National Rayon's equipment to use as a model. He, therefore, resolved to develop a process closely based on the Topham Method, which used spinning pots. The manufacture of the essential pot motors was a

major problem in Japan, which Kumura only overcame with difficulty and at the expense of much time.[55] Even when this problem had been overcome, his equipment remained very small by contemporary European standards. He was constructing machinery, with only four spindles per machine, while machines of sixty spindles were in use in Europe.[56] Much of Kumura's spinning equipment, too, remained defective when it was tried out at Yonezawa prior to the construction of the Hiroshima Plant. The cams and the transmission equipment were notably defective and the spinning motors functioned poorly.[57] The production of an orifice in the spinning cap with a smooth circumference, too, remained an unsolved problem.

In the autumn of 1919 Kaneko set a deadline. Technology was to be fully established and the Hiroshima Plant was to be in operation within one year. This proved to be an unrealistically tight deadline, as the establishment of technology and actual construction took two years and, even then, the plant suffered from some operating deficiencies.

By 1920 Kaneko was certainly confident of the success of the venture. With the onset of the postwar slump in early 1920, Suzuki was critically short of funds until late 1921. During 1920 only three very small new subsidiaries were established and nearly all further expansion at existing subsidiaries was brought to a stop. Nevertheless, Kaneko continued to finance the development of Imperial Rayon.

The Hiroshima Plant was a technological success from start-up. While for the first six months of operation from November 1921 to April 1922 the plant was down for almost half of the total operating time, there were no breakdowns of the basic equipment. Those faults which shut down

the plant were not fundamental. For example, there were leakages of oil, which turned the factory floor into a quagmire, making operation impossible, and shut-downs of the spinning motors due to their faulty damping which led to excessive vibration. However, no fundamental redesign of equipment nor of its arrangement was necessary.[58] The plant was expanded rapidly. Kumura's original spinning equipment was gradually replaced by Ratignier machines and Japanese equipment modelled on them. Production increased from initial levels of about 1,000 pounds per day to nearly 4,000 pounds per day by November 1924.

Conclusion

Kaneko had been completely vindicated. Suzuki had an operating rayon plant three years before Noguchi and six years before Mitsui. The firm expanded rapidly under Kaneko until Suzuki's bankruptcy in 1927 and, after that, as an independent. Throughout the twenties and much of the thirties, it was by far the biggest Japanese rayon producer[59] (Table XXVI). The apparently haphazard method of development, which led to near chaos at times, had created a group of technicians who could innovate in rayon production technology to a degree unparallelled in Japan. Imperial Rayon's early start and the mode of its founding were crucial factors in the later success of the company. As a pioneer, too, it must have had a tremendous advantage in operating experience and sales development over its tardy rivals.

Kaneko had been right to obtain European technology as soon as possible. As it happened, rayon technology became ever more readily available as the twenties advanced, but the availability of information

TABLE XXVI

MAIN JAPANESE RAYON PRODUCERS:
PROFITS & PRODUCTION IN LATTER HALF OF 1934

Company	Profit (1,000 yen)	Rate of profit (%)	Dividend rate (%)	Monthly Production (100 pounds)	Price for 120 denier (yen per 100 pounds)
Imperial Rayon	6,265	25	18	13,000	52.87
Asahi Bemburg	6,958	22	10	6,000	56.15
Oriental Rayon	4,500	30	20	2,500	58.00
Kurashiki Silk	4,573	23	25	4,500	45.00
Japan Rayon	2,178	21	12	300	43.50

at the end of the war might well have been only a brief window in the wall of corporate secrecy. The companies which moved to adopt foreign processes in the twenties might well have found these difficult or impossible to obtain.

Kaneko's development of rayon was characterized by great managerial skill and entrepreneurial daring. Nothing could have been more different from the ultra-cautious establishment of Mitsui's rayon arm or the timid and belated moves of textile capital.

Mitsui's venture, which came on stream fully six years after Suzuki's plant, was set up almost lock, stock and barrel by Westerners. It used Western processes and, essentially, Western machinery. The Japanese took over only after a period of foreign tutelage. Though there was little risk of failure, the scale of Mitsui's plant was pruned to ridiculous levels by a timid top management. While in fact Mitsui personnel innovated actively in the first years of plant operation, nothing was initially demanded of them but routine managerial ability and imitative technical capacity.

Where Mitsui bought timidly, Suzuki created boldly and skilfully. Kaneko chose researchers, supervised them ably and forced them to think commercially. He judged the stages of development accurately and set tight but realistic deadlines. In setting up the Hiroshima Plant, he took a considerable financial risk in straightened circumstances, when he backed his judgement of the capacity of his technicians and of the availability of technical knowledge in the West. His object in taking the risk was clearly to gain the advantages of the pioneer and to seize an opportunity to obtain Western technology, which might well not have

been available later. It was thus that he expanded the Suzuki empire.

VI. SUZUKI IN AMMONIA SYNTHESIS

Introduction

While there is a wealth of material available on Suzuki's activities in the rayon industry, we lack all but the barest outline of the company's notable role as one of the two pioneers in the development of the synthetic ammonia industry in Japan. The reasons for this are abundantly clear. Following the bankruptcy of the Suzuki Shōten in 1927, the well-developed Suzuki subsidiary, Imperial Rayon, established itself as a highly successful independent company, which was later to take a considerable pride in its origin as a Suzuki subsidiary. The very detailed official history of the firm reflects this sentiment fully. Suzuki's synthetic ammonia enterprise, Claude Process Nitrogen Industries, which was later to be called Number One Nitrogen, was not set up until 1922 and, due to Suzuki's financial difficulties during the twenties, was a far from profitable operation in 1927. The firm could not retain its independence like Imperial Rayon and it was taken over by Mitsui Mining in January 1929. Mitsui undoubtedly suppressed all but the most sketchy information on the Suzuki period. The official history of the Hikoshima Plant,[60] compiled during the period of Mitsui management, is a 480 page unpublished manuscript which was completed in 1939. It is poorly edited, but carries a wealth of detail, as it was compiled by the staff as a labour of love in their spare time. The vital Suzuki period, in which the plant was founded and the basic technology

established, is treated in a number of scattered references, which in aggregate total only about eight pages. In the introduction the editor attempts to explain the great under-representation of the Suzuki period. He states that the documents of Number One Nitrogen and a neighbouring Suzuki subsidiary, Japan Metals, had been mixed up and could not be distinguished. According to the editor, the only other information which existed was a technical diary of one engineer. This explanation is very unconvincing, however, as in 1939, according to the same source, two technicians and four office workers with experience of the Suzuki period were still at the plant. The two technicians, at least, were highly educated—the company history cites their qualifications—and could have given much more information than the minimal smattering of technical facts presented.

Adoption of the Claude Process

In 1920 Takahata Seiichi, Head of the London Office and a trader, not a technician, first heard of the Claude Process through an article in the Times newspaper.[61] Together with the representatives of other companies, Takahata had already investigated the proven Haber Process, but, partly for the reason that the terms for the Japanese rights to the patent had been deliberately set at prohibitively high levels, no company had made a bid for this process. In consulting with a close German friend on the Claude Process, he discovered that an Englishman called Barton, who was a friend of the German, was negotiating at that very time for the English rights to the process, and it was through Barton

that Takahata approached Aire Liquide, the French company which held the patent rights to the Claude Process. After many visits to the Claude pilot plant in the suburbs of Paris with engineers, Takahata decided that the patent rights should be acquired and convinced Kaneko to purchase them.[62]

As in rayon, in pursuit of industrial empire, Kaneko gambled boldly.

The possible gains were enormous. The more immediate tangible gains were large. No ammonia synthesis plant existed in Japan in 1920. Through the successful importation of ammonia synthesis technology, a growing share of the rapidly increasing and highly import dependent ammonia sulphate market could be won. Further in the future, too, great though less tangible gains existed. The mastery of high-pressure: high-temperature gas chemistry technology could open the way to a whole range of new chemical industries. Suzuki could be the first in Japan to cross the threshold of the modern chemical industry. Kaneko, in 1920, was almost certainly aware of the importance of ammonia synthesis, as the vital first step in the development of the modern gas chemical industry. As early as 1923, a small station had been established at the Hikoshima Plant to research a process for the synthesis of methanol.[63]

If the possible gains were enormous, the risks were considerable. The Claude Process had already been turned down by a number of prospective buyers, including all of the three largest zaibatsu. There were good reasons for their caution. The Claude Process had only been operated on a pilot plant scale of half-a-ton ammonia per day. The

physical conditions under which the process functioned were extreme. It utilized pressures of 1,000 atmospheres (five times that of the Haber) and temperatures of 700°C. In the early twenties, even the manufacture of equipment operating at 200 atmospheres strained the limited capacity of the infant Japanese machine-building industry. The adoption of the Claude Process would, therefore, necessitate the purchase of much expensive foreign equipment. There was doubt, too, as to just how well the pilot plant functioned. Some Japanese engineers, who had examined the plant, said that it functioned smoothly only for short periods and that visiting engineers were only admitted if it was operating well.[64]

Suzuki in the early twenties was very short of funds due to the sharp postwar slump. The Japanese rights to the Claude patent cost £500,000 sterling and Kaneko was hard-pressed to find such a large sum. He scraped together £250,000 in Japan, while Takahata supplied a further £250,000 from a secret contingency reserve which he had accumulated in London.[65]

Thus Kaneko, in contrast to established capital, grasped the opportunity offered. He accepted considerable risks to gain great possible benefits, even though unlike the Great Zaibatsu and textile firms Suzuki was hard-pressed for funds.

It may be thought that Kaneko acted too precipitately in purchasing the risky Claude Process and that he should have investigated less risky processes in depth. In fact, however, in 1920 the Claude was one of the only two processes on the market. The Haber Process, as we have noted, was in effect unavailable. The Fauser, the

NEC and the Ude Processes were still at an early stage of development. Only the Casale Process existed, but in 1920 it was embodied in a pilot plant even smaller than that of the Claude in Paris. Kaneko undoubtedly feared that the Japanese rights to both of these processes would be taken in the near future and, in adopting the Claude, he must have felt that he was seizing the most tangible chance to develop the ammonia synthesis industry within the Suzuki group.

Industrialization of the Process

It should be noted in passing that Kaneko's bold seizure of the opportunity implies a considerable faith in Japanese technology, which was strikingly absent in the case of established capital.

Given a fair opportunity, Kaneko might well have repeated his dazzling success in rayon in the field of ammonia synthesis. He was not, however, to be given that opportunity. From the start, Kaneko's development of ammonia synthesis was dogged by funding shortages. Though negotiations for the Claude Process had been concluded early in 1921, Claude Process Nitrogen Industries was not established until April 1922 due to financial stringency. Plant construction did not start until July of the same year.

Claude Process Nitrogen Industries was the last enterprise of any scale founded by Suzuki and, throughout the period of Suzuki control, funds were short at Hikoshima and the supply of parts was always a problem. Funding difficulties intensified after the end of 1924 probably as Suzuki commenced to sustain trading losses and, following January 1927, as the

plight of the parent company became more serious, no money was received for new construction or coverage of the perennial operating deficit.

Development was slow. This was partly due to equipment failures. For example, on July 13, 1925 there was a fire due to the rupture of a steel U pipe in the number one synthesis unit. On May 5, 1927 there was a large explosion in a hydrogen gas compressor and on August 3rd of the same year there was a further major explosion in a hydrogen production unit.[66] Though these equipment failures were due in part to the extremely high pressures and temperatures at which the Claude Process operated, a major underlying cause was the shortage of funding which led to skimping and the substitution of inferior materials and parts. The slow pace of construction and experimentation was also, to a large extent, probably due to the same cause.

Because of the deficiencies of the company history, we know nothing of the role of Kaneko or even of the leading technicians. Considering the critical shortage of funding, the establishment of the process proceeded quickly enough to vindicate Kaneko's judgement and to offer hope that his courage would be rewarded.

As the process had not been tested on a full industrial scale, the first plant was small and experimental. The experimental stage was completed fairly rapidly. By December 1924, the plant had a daily capacity of five tons ammonia per day or twenty tons ammonium sulphate per day.[67] Operation was satisfactory, as the plant was then scaled up. By June 1926, the trial operation of the enlarged plant had been completed and, with the start of full-scale operation, the firm was renamed

Number One Nitrogen Industries. The rate of production had now been doubled to ten tons of ammonia per day, or forty tons of ammonium sulphate.[68]

During Suzuki's management Number One Nitrogen was never a commercial success, but, in spite of the repeated breakdowns, the basic technology seems to have been mastered by the end of 1924. It seems very probable that, given adequate funding, the plant would have been profitable by 1926-27. The very cautious Mitsui was certainly impressed by the plant. Following the bankruptcy of the Suzuki Shōten, Number One Nitrogen came under the management of Mitsui Mining for a trial period of one year, commencing in January 1928. The operating performance of the Hikoshima Plant must have been impressive, as Mitsui was soon to found a plant of its own, utilizing the Claude Process. Clearing at the site of the plant of Miike Nitrogen Industries commenced as early as February 1930, indicating that rather detailed plans for the new plant had existed by the autumn of 1929 at the latest. Though the scale of the proposed plant was small for the end of the decade, its scheduled output of 36,000 tons per year ammonium sulphate was four times the originally scheduled output of the Hikoshima Plant.[69] This strongly indicates that the Hikoshima Plant, in 1927, was at such a stage that profitable operation was thought to be attainable in the near future. At the very least, it shows that the fundamental technology was regarded as sound by the most cautious.

The decision to import the Claude Process technology into Japan affords another striking illustration of Kaneko's determination and audacity in industrial expansion. Kaneko, in 1920, though desperately short of funds, seized the opportunity to buy what he believed to be the

better of the only two available synthetic ammonia processes, while the Great Zaibatsu and other major firms hung back. He boldly continued to channel a considerable volume of very scarce funds into the risky venture throughout the mid-twenties, while the Great Zaibatsu with abundant capital remained inactive. Only the acquisition of Suzuki's technically successful ammonia synthesis venture persuaded the timid Mitsui to enter the field. There is no indication that the textile companies ever considered a venture in the risky field of ammonia synthesis.

The technicians at Number One Nitrogen unquestionably responded well to the challenge, though we know nothing of their efforts as individuals. Only five Frenchmen were at the plant between 1923 and 1927—one engineer, three operators and one maintenance man.[70] The head of the plant was always a Japanese and most of the burden of the technical work must have been carried by the Japanese, as there were no fewer than sixteen engineering personnel by 1928.[71]

VII. SUMMARY

In the first quarter of the twentieth century, under the bold leadership of Kaneko, the Suzuki Shōten expanded almost continuously, at a rate unparallelled by any other Japanese company. With the financial support of the Tosa-linked Bank of Taiwan, obtained through a connection with Gotō Shimpei, the firm grew from a tiny trading company in 1900 to a small trade-centred zaibatsu by 1914. Thanks to Kaneko's almost uncanny genius in the interpretation of commercial and political

information relayed by his global intelligence net, the firm grew explosively during the World War I boom. Its trade outstripped that of Mitsui as it diversified into a number of industrial and non-industrial fields. By the end of the war, Suzuki rivalled Sumitomo in size, and was a feared adversary of Mitsui. The firm's expansion continued, though at a slower pace, until 1923. Kaneko vigorously exploited the opportunity in the new, technologically intensive industries, scoring a particularly striking success in his pioneering gamble in rayon. His almost equally bold venture in ammonia synthesis, although a technological success, never became profitable as funding was scarce. Suzuki's stagnation between 1924 and 1927 was due to financial difficulties caused by the deflationary policies of the government and not to a failure of the will.

THE SUZUKI SHŌTEN

FOOTNOTES

[1]Shiroyama Saburō, Nezumi (Tokyo: Bungei Shunjū, 1966).

[2]Shiraishi Tomoji (ed.), Kaneko Naokichi Den (Tokyo: Kaneko: Yanagida Ryōō Shōtokukai, 1950).

[3]Yanagida Giichi (ed.), Kaneko Naokichi Ihōshū (Kobe: Tatsumikai, 1972).

[4]Tujimoto Terusanerō, Matsukata: Kaneko Monogatari (Kobe: Kobe Shimbunsha, 1960).

[5]Shiroyama, loc. cit.

[6]Katsura Yoshio, "Sōgō Shōsha to Kanren Kigyō: Suzuki Shōten," Keiei Shigaku, 8:37, August, 1973.

[7]Shiraishi, op. cit., p. 51.

[8]Katsura, op. cit., pp. 36-37; and Shiraishi, op. cit., p. 53.

[9]Shiraishi, op. cit., p. 55.

[10]Katsura, loc. cit.; and Shiraishi, op. cit., p. 61.

[11]For Gotō's long association with Kaneko, see pages 296, 306-307.

[12]Katsura, op. cit., p. 36.

[13]Ibid., p. 39.

[14]Ibid., pp. 51-52.

[15]Ibid., p. 39.

[16]Ibid., p. 41.

[17]Ibid., p. 42.

[18]Ibid., p. 51.

[19]Shiraishi, op. cit., p. 95.

[20]Ibid., p. 96.

[21]Katsura, op. cit., p. 43.

[22]Ibid., p. 44.

[23]Shiraishi, op. cit., p. 100.

[24]Ibid., p. 102.

[25]Ibid., pp. 104-107.

[26]Katsura, op. cit., p. 45.

[27]Ibid., p. 48.

[28]Ibid., pp. 51-54.

[29]Ibid., pp. 51-55. The aggregate paid-up capital of the Suzuki Group has been deliberately calculated by a simple summation of the paid-up capital of the subsidiary firms. While it would be possible to refine this total by adjusting the paid-up capital of the subsidiaries to real money terms in a standard year, this would not increase the accuracy of comparison with the major zaibatsu. The paid-up capital of the major zaibatsu in real terms is not available, as the data to compute it is inadequate.

[30]Takahashi Kamekichi and Aoyama Jirō (eds.), Nihon Zaibatsu Ron (Vol. I of Nihon Kontsuerun Zensho. Tokyo: Shunjūsha, 1938), p. 78.

[31]Katsura, op. cit., p. 49.

[32]Ibid., pp. 46-47.

[33]Ibid., p. 54.

[34]Takahashi Yoshizō, "Survey of the Japanese Financial Crisis of 1926-28" (unpublished Master's thesis, Columbia University, New York, 1928), p. 73.

[35]Fukushima Katsuyuki (ed.), Ichiryū no Mugi (Vol. I of Teijin no Ayumi. Tokyo: Teijin K.K., 1968), p. 13.

[36]Ibid., pp. 15-33.

[37]Ibid., p. 51.

[38]Ibid., pp. 38-39.

[39]Ibid., p. 47.

[40]Ibid., p. 48.

[41]Ibid., pp. 52-56.

[42]Ibid., p. 56.

[43]Ibid., p. 58.

[44]Ibid., p. 77.

[45]Ibid., p. 99.

[46]Ibid., pp. 90-94.

[47]Ibid., pp. 112-114.

[48]Ibid., p. 129.

[49]Ibid.

[50]Ibid., p. 131.

[51]Ibid., p. 133.

[52]Ibid., p. 131.

[53]Ibid., pp. 132-133.

[54]Ibid., p. 134.

[55]Ibid., pp. 188-189.

[56]Ibid., p. 196.

[57]Ibid., p. 198.

[58]Ibid., pp. 201-202.

[59]Kajinishi Mitsuhaya (ed.), Seni Jō (Vol. XI of Gendai Nihon Sangyō Hattatsu Shi. Tokyo: Tōkōryo, 1964), Table IV-143, p. 523.

[60]"Tōyō Tōatsu Kōgyō K.K.: Hikoshima Kōgyōsho Gojū Nen Shi" (unpublished manuscript, 1939).

[61]Shiraishi, op. cit., pp. 203-204.

[62]Ibid., pp. 204-205.

[63]Tōyō Tōatsu Kōgyō, op. cit., p. 261.

[64]Statement by Ishige Ikuji, personal interview, May 1973. Ishige was in charge of operations at Number One Nitrogen immediately after the Mitsui takeover.

[65]Shiraishi, loc. cit.

[66]Tōyō Tōatsu Kōgyō, op. cit., pp. 177 and 179-180.

[67]Ibid., pp. 155-156 and 172.

[68]Ibid., pp. 155-156; and Shibamura Yōgo, "Kaneko Naokichi to Kagaku Kōgyo: Nihon Kagaku Kōgyō o Kizuita Hitobito 11," Kagaku Keizai, February, 1969, p. 70.

[69]Nihon Ryūan Kōgyō Kyōkai, Nihon Ryūan Kōgyō Shi (Tokyo: Nihon Ryūan Kōgyō Kyōkai, 1968), Table 2-16, p. 136.

[70]Statement by Yamasaki, personal interview at Ōmuta, June, 1973. Yamasaki was an operative who worked at Hikoshima during the twenties.

[71]Tōyō Tōatsu Kōgyō, op. cit., pp. 409-410.

CHAPTER V

JAPAN NITROGENOUS FERTILIZERS

I. INTRODUCTION

While Japan Nitrogenous Fertilizers (JNF) achieved much as a bold pioneer in the importation of chemical technology prior to 1927, its growth, though swift, was unspectacular compared to the explosive development of Suzuki. After 1927, however, the firm commenced an expansion which was almost as remarkable as Suzuki's had been, although we shall only be concerned with the first few years of this period of dramatic growth. The firm's growth is our main theme, but first we must consider its disputed relationship with the Mitsubishi Zaibatsu.

II. INDEPENDENCE OF JAPAN NITROGENOUS FERTILIZERS

Sources differ greatly in their description of the link between JNF and Mitsubishi. Three sources virtually ignore the connection altogether. Nihon Chisso Hiryō Jigyō Taikan[1] (A Survey of the Operations of Japan Nitrogenous Fertilizers) and Noguchi Jun Wa Ikite Iru[2] (Noguchi Jun is Alive Today) do not treat the relation at all, while Noguchi Jun: Ningen to Jigyō[3] (Noguchi Jun: The Man and his Works) notes JNF's early subordination to Mitsubishi, but fails to describe the connection at a later date. Three other sources assign JNF a satellite role until quite late. According to Hantō no Jigyō Ō: Noguchi Jun[4] (The King of Korean Industry: Noguchi Jun), Noguchi's JNF was controlled by Mitsubishi throughout the twenties, while Nihon Kontsuerun Zensho (The Combines of Japan Series) Volume XI[5]

attributes a satellite status to Noguchi until 1933. The end paper diagram in Nihon Kontsuerun Zensho (The Combines of Japan Series) Volume III[6] shows JNF as part of the Mitsubishi Combine even in 1937. Among present-day Japanese businessmen who are interested in business history, too, opinion is divided as to the date of Noguchi's independence.

If Noguchi had indeed been a Mitsubishi satellite throughout the twenties, then our case that Mitsubishi was sluggish in developing new industries and that JNF was an independent and aggressive rising company would be invalidated. Therefore, let us first demonstrate the independence of JNF.

In the early part of Noguchi's career he certainly depended on Mitsubishi. Seeking to expand a small electricity and carbide producer, Soki Electric, which he had started in 1906, Noguchi travelled to Europe in 1908 and obtained the Japanese patent rights for a process to manufacture calcium cyanamide. On return to Japan he planned a small cyanamide plant at Minamata in Kyushu, but at first only Mitsui, which demanded full control, offered finance. Through a prominent politician, Nakahashi Tokugorō, he became acquainted with Toyokawa Ryōhei, Head of the Mitsubishi Bank, and Kondo Renhei, Head of Osaka Merchant Shipping and closely associated with Mitsubishi. Through the patronage of these two powerful figures, he obtained finance from Mitsubishi on terms which gave him a fair degree of independence,[7] though Mitsubishi must have retained overall control. The list of directors of Soki Electric immediately prior to the renaming of the company as JNF in August 1908 clearly shows the subordinate position of Noguchi and associates[8] (Table XXVII).

TABLE XXVII

SOKI ELECTRIC: BOARD OF DIRECTORS 1908

President	Nakahashi Tokugorō	Neutral
Managing Director	Noguchi Jun	Noguchi Group
" "	Fujiyama Jōichi	" "
Director	Toyokawa Ryōhei	Associated with Mitsubishi
"	Kondō Renhei	" " "
"	Ichikawa Seiji	Noguchi Group
"	Kakumu Kōichirō	Neutral Director of the Aichi Bank
"	Hori Keijirō	Associated with Nakahashi President of Osaka Merchant Shipping Therefore associated with Mitsubishi
"	Watanabe Yoshirō	Associated with Nakahashi Head of the Aichi Bank

None of the Mitsubishi-associated directors were technical men, and the zaibatsu backed Noguchi's technical judgement during a long period of expansion from 1908 to the end of World War I. This freedom was a product not only of Noguchi's great technical competence, but of his friendly relation with Toyokawa and Kondō.

At first financing was entirely through Mitsubishi, but by 1910 a 500,000 yen loan had been negotiated with the Industrial Bank of Japan. In order to finance the rapid wartime plant construction program, loans were made not only from the Mitsubishi Bank, but also from the Aichi and Yamaguchi Banks.

No detailed figures are available as to loans raised by bond issue at any period and, as there are no lists of principal stockholders until 1928, the only direct means of assessing the degree of control exercised by Mitsubishi prior to that year is the composition of the Board of Directors.

In 1920 Mitsubishi was still in control[9] (Table XXVIII). The highest position, that of Chairman, was held by a representative of the Mitsubishi group, while two other representatives of the group, Kondō and Sengoku, held directorships. Sengoku Mitsugu's close connection to Mitsubishi cannot be doubted, as he was notorious as a principal channel of funds between the combine and the Kenseikai during the twenties. Yet a further director, Hori, was loosely connected with the zaibatsu. The Noguchi group held only three directorships, although they were senior posts.

TABLE XXVIII

JAPAN NITROGENOUS FERTILIZERS: BOARD OF DIRECTORS 1920

Position	Name	Affiliation
Chairman	Toyokawa Ryōhei	Associated with Mitsubishi
Senior Managing Director	Noguchi Jun	Noguchi Group
Junior Managing Director	Ichikawa Seiji	" "
Director	Watanabe Yoshirō	Associated with Nakahashi Head of the Aichi Bank
"	Sengoku Mitsugu	Associated with Mitsubishi
Director & Controller	Enokinami Naosaburō	Noguchi Group
Auditor	Kakumu Kōichirō	Neutral Director of the Aichi Bank
"	Hori Keijirō	Associated with Nakahashi President of Osaka Merchant Shipping Therefore associated with Mitsubishi
Consultant	Kondō Renhei	Associated with Mitsubishi

In 1921, however, Mitsubishi lost control[10] (Table XXIX). The Noguchi group now held all three senior positions on a much reduced board. The death of Toyokawa and the resignation of Kondō left Sengoku as the only firm Mitsubishi supporter.

This change undoubtedly reflects the greatly increased financial strength of the firm, which after World War I was no longer dependent on Mitsubishi. Just how Noguchi escaped from the control of the zaibatsu is not clear, but it would seem that, although he could have broken free earlier, he waited until the death and retirement of his two venerable benefactors. It is possible that the bonds between Mitsubishi and Noguchi rested upon personal obligation and not law.

In 1922 the balance of the board was somewhat redressed in favour of Mitsubishi by the addition of Kirishima Zōichi, a director of the Mitsubishi Bank, but the Noguchi group still clearly dominated. In the new board, which was to remain unchanged until 1928, the Noguchi group held the three senior positions, while there were only two firm Mitsubishi supporters and one person loosely associated with the combine.

In 1928, when a list of stockholders first becomes available, Mitsubishi held relatively little stock in JNF[11] (Table XXX). Among the top twenty shareholders the Noguchi group held 201,856 shares. Probable Mitsubishi associates held only 58,618 shares and, with the addition of Kondō Shigeya, who may have been associated with Mitsubishi, the aggregate of the zaibatsu was only 100,618 shares. It is highly unlikely that a large number of the small shareholders were linked to Mitsubishi.

TABLE XXIX

JAPAN NITROGENOUS FERTILIZERS: BOARD OF DIRECTORS 1921

Position	Name	Affiliation
Senior Managing Director	Noguchi Jun	Noguchi Group
Junior Managing Director	Ichikawa Seiji	" "
Director	Watanabe Yoshirō	Associated with Nakahashi Head of the Aichi Bank
"	Sengoku Mitsugu	Associated with Mitsubishi
Director & Controller	Enokinami Naosaburō	Noguchi Group
Auditor	Kakumu Koichirō	Neutral Director of the Aichi Bank
"	Hori Keijirō	Associated with Nakahashi President of Osaka Merchant Shipping Therefore associated with Mitsubishi

TABLE XXX

JAPAN NITROGENOUS FERTILIZERS:
TWENTY LARGEST SHAREHOLDERS 1928

Shareholder	No. of shares	Affiliation
Noguchi Gōshi	139,000	Noguchi Group
Kondō Shigeya	42,000	Mitsubishi?
Aichi Bank	33,000	Neutral
Iwasaki Hisaya	30,000	Mitsubishi
Moroto Industries	29,900	?
Noguchi Jun	28,076	Noguchi Group
Ichikawa Seiji	26,760	" "
KoreanHydro-electric	20,000	?
Tokyo Marine & Fire	20,000	Yasuda
Kakumu Ryōkō	17,754	Neutral
Asao Toyoichi	12,000	?
Number One Life Insurance	10,600	Neutral
Sanei Limited Partnership	10,034	Mitsubishi
Hori Tatsu	10,000	"
Kakumu Kamayoshi	10,000	Neutral
Osaka Trading	9,056	"
Nakahashi Seiichi	9,000	"
Sengoku Mitsugu	8,584	Mitsubishi
Nakahashi Kinji	8,500	Neutral
Enokinami Naosaburō	8,020	Noguchi Group

Total shares issued 900,000

Total number of shareholders 1,381

NOTE: Alignments are partly based on data from Ginko Kaisha Yoroku 1928.

It could be argued that Mitsubishi could have controlled JNF through the company's indebtedness to the zaibatsu and not through the ownership of shares. However, it seems very unlikely that Mitsubishi would have had effective control and yet not appointed the senior officers of the board.

Thus, the direct evidence available concerning the link between Mitsubishi and JNF indicates that Noguchi's enterprise had become independent of the zaibatsu by 1921. Mitsubishi continued to finance the firm, but simply as a lucrative investment. There is considerable indirect evidence to confirm the independence of JNF.

By 1925 there is even evidence of conflict between Mitsubishi and JNF. In that year both companies submitted applications for permits to water rights for the generation of hydro-electric power on two rivers in North Korea--the Pujon Kang and the ChangjinKang. A dispute arose between the two firms as to which had priority of application. At just this time a fire of mysterious origin at the office of the Government-General of Korea burnt all relevant documents. The Government-General, probably under pressure from Mitsubishi, decided--without documentation--that Mitsubishi had the prior claim. Noguchi was not to be put down so easily, however. Through the dietman Shigematsu Shigeji he exerted political pressure and a struggle ensued. Finally, in June 1925, the Chief Civil Administrator, Shimooka Chūji, partially reversed the previous decision in favour of Noguchi, stating that the entrepreneur was much more likely to develop the project aggressively than any of the sluggish zaibatsu. Noguchi was awarded the lesser prize of the rights

on the Pujon Kang, while Mitsubishi received those on the Changjin Kang.[12] In passing we should note that this seems to have been the first instance in which a colonial government in the twenties supported a rising company against one of the Great Zaibatsu. Already it seems there were the beginnings of the links between the colonial governments and the rising companies, which were to become the so-called new zaibatsu in the boom of the 1930's.

There is a further proof of at least a weakness in the connection between Mitsubishi and Noguchi. Mitsubishi imported a certain amount of technologically novel chemical equipment from Europe, but none of this was transmitted to JNF.

In 1925, seven Mitsubishi enterprises: Mitsubishi Shōji, Mitsubishi Gōshi, Mitsubishi Mining, Mitsubishi Shipyards, Mitsubishi Iron, Mitsubishi Internal Combustion and Mitsubishi Paper,[13] in concert with the Metal Bank of Germany, set up a Berlin-based company with a capitalization of 10,000 gold marks in order to import new technology. The firm cooperated with the Tokyo-based Ryōyō Industries with an authorized capitalization of sixty million yen. However, there is no evidence that any of the chemical hardware imported by this organization prior to its dissolution in 1931 was destined for the companies associated with Noguchi.[14]

Mitsubishi Shōji itself was active in technology transfer. The firm set up a branch in France in 1924 and one in Germany in 1928 expressly for that purpose. Of the not inconsiderable amount of chemical hardware that these branches imported into Japan, none went to Noguchi's enterprises.[15]

We have shown that Noguchi had almost certainly ceased to be a Mitsubishi satellite by 1921. Why then have a number of writers treated him as such up to 1930 or even 1937? One can only surmise, but it seems probable that both zaibatsu and former satellite, each for reasons of its own, sought to maintain the public illusion of a continuity in the connection after 1921. For the rapidly growing but still relatively small Noguchi enterprises, the apparent backing of Mitsubishi lent an appearance of stability and financial strength. For Mitsubishi, the appearance of control of the well-known, technologically active and swiftly expanding Noguchi enterprises was not only somewhat prestigious, but also afforded a ready answer to the swelling chorus of public criticism that the giant combine was more than somewhat sluggish in the industrialization of new and risky technology. The writers who have placed Noguchi within the Mitsubishi empire in the 1920's have simply taken public image for reality.

III. DEVELOPMENT OF JAPAN NITROGENOUS FERTILIZERS: AGGRESSIVE LEADERSHIP AND POSITIVE RESPONSE

Prior to Ammonia Synthesis

While the rapid growth of JNF into a giant combine was due to Noguchi's highly successful industrialization of imported ammonia synthesis technology, the earlier development of the firm, too, is of considerable interest as an illustration of entrepreneurial enterprise. The early history of the company shows Noguchi's bold expansion of the firm by the industrialization of new chemical technology. While

Mitsubishi, as we have seen, in the earlier period backed Noguchi, the giant combine stood to lose little in comparison to its enormous resources. Noguchi risked almost everything. He had invested nearly all his capital and all of his life work in his enterprise. Yet, he ventured boldly in total contrast to the timidity of the giant combine with which he was at first so closely associated.

Noguchi Jun's career in industry commenced characteristically with an act of creation. In 1902, Noguchi, then an electrical engineer, and a small group of associates developed a process for the manufacture of calcium carbide, closely modelled on that invented by the Canadian T. L. Wilson in 1892. The group set up a miniscule plant and started production almost immediately.[16]

In 1906, Noguchi and associates established the small electricity generating company, Soki Electric, to supply mines in Kyushu. The surplus power generated by this company was used to produce calcium carbide with the process developed in 1902.[17] Soki Electric was the seed from which JNF and its successor, the giant Nitchitsu Combine, were to grow.

Soki Electric was profitable, but only modestly so. The ambitious Noguchi now determined on a bold step. Instead of producing low-priced calcium carbide, he would use an increased electricity output at Soki Electric to manufacture the much more valuable fertilizer calcium cyanamide. The process for calcium cyanamide was new. It had been patented by Frank and Caro in Germany in 1906.[18]

Showing considerable dash and enterprise for the leader of such a small firm, Noguchi travelled to Europe in 1908 to attempt to get the Japanese rights against very formidable competitors. When Noguchi arrived, the Mitsui and Furukawa Zaibatsu were actively negotiating for the patent and Furukawa's representative was none other than Hara Kei, the prominent, not to say pivotal, leader of the Seiyūkai and future prime minister of Japan. Yet it was Noguchi who prevailed. While his success may be attributed in part to his skill as a negotiator, it was mostly due to his background in manufacturing. Soki Electric, although very small, had a good record in electro-chemical manufacture, which was not matched by either of the zaibatsu. Noguchi, after graduation from the Imperial University at Tokyo, had worked for the Japanese branch of the German firm Siemens and Halske A.G. Kessler, Noguchi's former supervisor at Siemens, was of considerable assistance in giving him an introduction to the inventors Frank and Caro, who had been financed by the Reich Bank and Siemens.[19]

The establishment of the calcium cyanamide plant at Minamata in Kyushu proved to be no easy task, but thanks to Noguchi's skill in adaptation and his energy, it was successfully accomplished. Noguchi took charge after the removal of Fujiyama Jōichi as head of construction. Fujiyama, instead of establishing a plant based directly on the technology purchased in Germany, had unsuccessfully attempted to develop a variant of his own. Noguchi, who was a highly competent engineer, designed and supervised the construction of a smoothly-functioning furnace, capable of manufacturing the quality of product required.

During the construction of the plant, Noguchi is said to have worked long hours with tremendous energy.[20]

Due to the disastrous consequences of the application of the fertilizer in some areas, sales of cyanamide increased with disappointing slowness. The failure of cyanamide in certain areas was due to a combination of factors. Cyanamide could only be applied under certain conditions as a fertilizer and, as it was a new product, relatively little was known about its mode of application even in Europe. Then, too, there was the general ignorance of the Japanese peasant concerning artificial fertilizers. However, some of the blame must be attributed to JNF, as the firm appears to have made little attempt to obtain and disseminate available information on the use of the fertilizer.[21] Noguchi appears to have lacked an appreciation of the importance of marketing.

The buoyant Noguchi was not the man to be easily checked. If cyanamide sales rose sluggishly, then he would switch to something else. For a third time within a decade Noguchi sought to industrialize new foreign technology. The present step was to be much bigger than the preceding ones. Noguchi planned a new plant which would manufacture calcium cyanamide, but much of this would be converted to ammonium sulphate, using the so-called transformed ammonia process (see Appendix, page), which was entirely new to Japan. Ammonium sulphate offered few problems in application as a fertilizer, and demand was rising rapidly for it in the immediate pre-World War I period.

Gambling his company's existence, Noguchi boldly set up a fairly large plant. Few details are available, but the factory appears to have been established and to have come on stream smoothly without any kind of foreign tutelage. Almost certainly, nearly all the equipment was of foreign manufacture. The plant, which was located at Kagami in Kyushu, commenced operating in January 1914 with the following annual capacities: calcium carbide 10,000 tons; calcium cyanamide 25,000 tons; and ammonium sulphate 20,000 tons.[22] From these figures it appears that Noguchi planned to convert all of the calcium carbide to calcium cyanamide, but only to convert a little over half of the cyanamide to ammonium sulphate.

The Kagami Plant was a great success. With technology firmly established, JNF was able to reap enormous profits in the following World War I boom,[23] and Noguchi took full advantage of the opportunity offered to expand his kingdom[24] (Table XXXI). In 1918, four years after the establishment of the plant, the firm was producing more than four times the initial output of ammonium sulphate and more than five times the output of calcium cyanamide.

By 1918, Noguchi had already demonstrated a capacity for audacious expansion in a spirit which was in marked contrast to that of the established companies. He had gambled three times on the capacity of himself and his staff to industrialize technology new to Japan and, in the second gamble in 1908, the stakes had been high. In the case of failure, Mitsubishi would have had prior claim on assets, and Noguchi would have almost certainly been bankrupted. In addition to financial loss,

TABLE XXXI

PROGRESS OF JAPAN NITROGENOUS FERTILIZERS 1909-1918

YEAR	PAID UP CAPITAL (million yen)	GROSS PROFIT (thousand yen)	DIVIDEND RATE (%)	PRODUCTION		
				Ammonium sulphate (tons)	Calcium carbide*	Calcium cyanamide (tons)
1909	1.00	93.0	10.0	-	3,911	-
1911	1.75	145.0	9.0	1,394	15,046	3,278
1912	2.00	285.0	10.0	60	16,748	5,026
1914	3.20	463.0	9.0	7,518	27,220	7,843
1916	5.50	2,450.0	17.5	20,528	44,308	24,588
1918	7.60	3,027.0	30.0	34,521	84,032	43,015

*Unit of production unclear in source.

Noguchi would have been discredited as a technician and as a manager. Prior to World War I, Noguchi had demonstrated that imaginative daring of approach, which was to characterize his postwar career. The young technician, seeking to expand his domain by a personal plunge into an unknown Europe in 1908, was to be parallelled by the mature businessman of the mid-twenties, who pioneered an industrial empire in Korea. The head of JNF had also shown a penchant for direct personal involvement with his ventures, which was a far cry from the remote control methods of the Great Zaibatsu leadership.

Ammonia Synthesis

Pre-Korea. Noguchi had understood the significance of ammonia synthesis long before he attempted to introduce it into Japan. Prior to World War I, he wrote a series of articles on the subject in the journal Denki Hyōron (The Electricity Review), which were collected and published in book form in 1914 under the title Kūchū Chisso Kōtei Hō (A Method for the Fixation of the Nitrogen of the Air). Noguchi clearly saw that progress in ammonia synthesis depended on the solution of problems of equipment manufacture, rather than of chemistry. He forecast a relatively early solution to these problems.[25] Perhaps earlier than anyone else in Japan, the head of JNF understood that the future of the ammonia industry and of much of the Japanese chemical industry as a whole lay with high-pressure, high-temperature gas synthesis.

With the termination of the war, Noguchi was undoubtedly impatient to travel to Europe to seek the Japanese rights to the ammonia synthesis

processes which had been developed there. He was delayed at first by the need to counter the impact of the postwar slump on his enterprise, and shortly after by a serious illness which incapacitated him for more than a year. It was not until January of 1921 that Noguchi, accompanied by two of his leading engineers, left for Europe to search aggressively for new technology.[26]

In the winter of 1921, only the Casale Process appears to have been available. The Haber Process was deliberately priced so high as to be outside the bounds of profitable application and no source notes Noguchi as examining the Claude Process. This process was probably in the final stages of purchase by Suzuki at this time. The Fauser, the NEC, and the Ude Processes were, as yet, undeveloped.

In 1921, the Casale Process was embodied solely in a tiny pilot plant at Turin in North Italy, producing only a quarter-of-a-ton ammonia per day. It had been examined and turned down by a number of engineers, including representatives of the Suzuki Shōten and of the Kuhara Zaibatsu. All had lost interest, as they considered the scale of the pilot plant too small to judge the viability of the process on an industrial scale, and the price also discouraged them.[27]

Noguchi, after a careful examination, came to an entirely different conclusion. He was so keen to buy that he could scarcely conceal his enthusiasm from Casale, who was negotiating with him. The price, however, was one million yen and Noguchi could not at this time make a pledge on behalf of JNF for such a large amount, as the old Mitsubishi-dominated board still controlled the company in the early

months of 1921. Showing considerable courage, he placed a deposit of 100,000 yen for a two-week option and telegraphed the directors in Tokyo, urging that the acquisition of the process was essential to the firm's future existence. The reply was favourable, and he returned to Japan to explain the Casale Process to the board.

It is very probable that the old board of directors was unwilling to take the considerable risk of industrializing the Casale Process, when they came to fully understand its complexity, and that Noguchi did not finally triumph until the appointment of the new board during 1921, as the agreement between the Casale Ammonia Company and JNF was not signed until the December of that year.[28] It is significant that the agreement for the Japanese rights to the patent and related equipment was signed by Noguchi alone for JNF. Here Mitsubishi caution stood in striking contrast to Noguchi audacity. Had the industrialization of the Casale failed, the cautious Mitsubishi could have recouped its losses by appropriation of the assets of its subsidiary. The daring Noguchi, on the other hand, as the principal shareholder of JNF, stood to make considerable losses. Noguchi's audacity was even greater than it might seem from the above account. While negotiating with Casale in early 1921, he was also investigating rayon technology and, in the autumn of that year, had a part share in the purchase of a patent (see page).

With the Casale Process rights acquired, Noguchi, freed from outside restraint, moved swiftly to establish a plant on a fairly large scale. This plant was to be the first in the world to manufacture synthetic ammonia by the Casale Process on a full industrial scale and

the first synthetic ammonia producer of any type in Japan. Noguchi was the centre of attention not only of the chemical industry, but of much of the rest of the Japanese industrial world. Synthetic ammonia, at that time, had a novelty and excitement value comparable to that of atomic energy in the post-World War II decade. A harsh limelight played remorselessly on the activities of JNF and its leader, who did not shrink from the glare of publicity. This was a far cry indeed from the timidity of Dan Takuma, who had not even wished the name of Mitsui associated with his rayon venture, even though that relatively small-scale enterprise came on stream a full six years after Suzuki's pioneering venture, and was directly established by Courtaulds, the world leader in rayon.

Noguchi's plant, located at Nobeoka in Kyushu, had a capacity of 12,500 tons of ammonium sulphate per year and came on stream in the October of 1923. Operations started smoothly. Noguchi seems to have placed considerable confidence in his Japanese technical staff. At least three Italians were involved in the construction and initial operation of the Nobeoka Plant, but the overall head and division chiefs were all Japanese.[29] It seems probable that the Japanese played a large part in the construction of the plant and were soon in complete charge of its operation. Noguchi himself did not play any direct role in the establishment of the plant. Of the Japanese technicians at Nobeoka only a certain Kūdō appears to have had any considerable training abroad, and the operation of such a complex plant with so little foreign tutelage affords ample testimony of the calibre of Noguchi's technicians and their excellent motivation.

The Nobeoka Plant was an immediate commercial success. Work to double its capacity started as early as December 1923. Soon after this, construction of a 60,000-ton-per-year ammonium sulphate plant commenced at Minamata, which came on stream in March 1926.[30] Noguchi's bold gamble had paid off handsomely.

At the Nobeoka and Minamata Plants a group of technicians was trained to a high level of competence in the operation of the Casale Process by Kūdō and other members of the initial technical staff. It was this group which formed the mainspring for Noguchi's most dazzling exploit—the thrust into Korea.[31]

The Korean empire. In the late twenties, Noguchi moved to establish an ammonium sulphate plant in Korea on a scale entirely unprecedented in the Japanese Empire, and which was to form the base of a huge future complex of chemical industries.

Why did Noguchi seek to establish his industrial empire in Korea and not in Japan proper? JNF's chroniclers have almost unanimously stated that cheap Korean hydro-electric power was the principal motive, but it was almost certainly only a subsidiary reason.

No authority disputes that the cost of hydro-electric power in Korea was much lower than in Japan proper. Fukumoto, for example, quotes the cost of electricity on the Pujon Kang in the late twenties as 0.5 sen per KWH against approximately 1.0 sen for Japan proper.[32] It is highly doubtful that the total costs of ammonium sulphate production were greatly cheaper than in Japan, however. There are no reliable figures available for the proportion of power cost to total cost, but we

can make a very rough approximation. In Japan proper, the power costs of Shōwa Fertilizers were said to be thirty-six per cent of total operating costs in 1931, or very approximately twenty per cent of total costs including capital costs.[33] While a halving of power costs could be achieved in Korea, all other costs would be increased. Interest on capital would be higher as the risk was higher in Korea; construction costs would be inflated by the rigour of the climate which hampered building; and there would be the cost of shipping equipment from Japan. There was also the enormous cost of building an entirely new economic infrastructure in the virtually virgin terrain of North Korea. This must have been borne almost entirely by Noguchi and his financial backers, as the Bank of Korea, weakened by the postwar slump and the continuing depressed state of the Japanese economy, was incapable of such large-scale lending at this time.[34] It certainly cannot be argued that no power was available in Japan proper, as there was a tremendous glut of hydro-electric power during the late twenties and even into the early thirties.[35]

While it seems unlikely that the costs of ammonium sulphate production would be greatly lower in Korea, the risks of constructing plant there were considerably greater, especially if the construction program were to be carried out in haste. Noguchi's proposed location was very close to the border with the USSR at a time when the normally hostile relation between Japan and that country was unusually intense. There was also an entire lack of reliable water run-off data for the rivers in North Korea, a fact of which Noguchi, the engineer, could not

but have been painfully aware, even if Noguchi, the entrepreneur, chose to gamble. It was a great over-estimation of run-off which was to nearly bankrupt him in the early thirties.

Balancing the rather small probable economic gains of the Korean location against its high and definite risks, it is hardly possible that purely economic reasons motivated Noguchi to invest massively in Korea. North Korea could not be regarded as a militarily secure area, affording an immediate and certain supply of cheap hydro-electric power for the production of ammonium sulphate at costs well below those possible in Japan proper. Korea could be seen, however, as a potential bastion against the Great Zaibatsu. It is this that almost certainly drew the attention of the empire-building entrepreneur Noguchi Jun to Korea.

Noguchi had good reason to be wary of the Great Zaibatsu. Firstly, there was his personal experience of Mitsui's aggressive stance at the time of the establishment of the cyanamide plant at Minamata in 1908. Secondly, and much more important, there was the example of the hostility of Mitsui to the Suzuki Shōten. Noguchi cannot but have been aware of Mitsui's fear of Suzuki's sustained advance and of Mitsui's attack on the Kobe trader in 1918. Were Noguchi's enterprise to grow to a considerable size, then it too would become the target of the Great Zaibatsu. Noguchi must have been aware of Mitsubishi's attitude toward him, as he was in contact with Mitsubishi representatives on the board of JNF. The policy of Mitsubishi was almost certainly to continue to contribute to the funding of JNF, but to attempt to regain control of the company. Mitsubishi's attempt to obtain the water rights on the Pujon Kang and the Changjin Kang was

very probably a pre-emptive attack. Mitsubishi may well have got wind of Noguchi's plans and moved to stop his advance. Had Mitsubishi obtained the water rights to both river systems, it would probably have then offered Noguchi the rights in exchange for a controlling share in his venture. Mitsubishi's actions at the time of the Fujihara-Bosch Agreement in 1930, too, indicate the predatory spirit of the giant combine.

In Japan proper, Noguchi was vulnerable to Great Zaibatsu pressure. Water rights for hydro-electric power supply were notorious for their political vulnerability, and the Great Zaibatsu were even more notoriously influential in politics. Noguchi himself had been the victim of the Railway Bureau, which had temporarily confiscated some of his water rights in Kyushu prior to World War I.[36] In Korea, on the contrary, Noguchi could count on a degree of support from the anti-zaibatsu military Government-General. By the late twenties he could expect not only freedom from political and economic harassment, but even a degree of financial assistance. If these were indeed Noguchi's expectations, they were to be amply justified by events after 1930.

Noguchi gambled. In May 1927 Korean Nitrogenous Fertilizers was established with a total capitalization of ten million yen. This was entirely subscribed by JNF. In the next four years, the new enterprise spent approximately 550 million yen on hydro-electric development, chemical plant, and township construction.[37] In the initial four years these funds were supplied in part by JNF, but for the most part by the Mitsubishi, Sumitomo and Aichi Banks. These banks, we may be sure, took little risk. Their loans were secured by liens on Korean Nitrogenous Fertilizer's

hydro-electric installations and chemical plant in the peninsula and also on the plant of JNF and Asahi Silk in Japan proper. Risks of property as well as of reputation and future prospects were borne by Noguchi and his associates.

The scale of the expansion which Noguchi planned and executed in the mid- and late twenties is staggering. Only the explosive growth of the Suzuki Shōten during World War I, or Mori's creation of the ammonia synthesis plant at Kawasaki in 1930, bear comparison. Nothing done by the Great Zaibatsu and still less by textile capital, in any way approached it in vision and daring.

Noguchi planned a huge ammonia synthesis plant at Hamhung in North Korea, which was to be the base of a later chemical manufacturing complex of unprecedented scale. While the ammonia synthesis plant did not represent a qualitative technological advance, it was an enormous leap forward quantitatively. By 1926, JNF had considerable operating experience with the Casale Process, having a 25,000-ton-per-year ammonium sulphate plant at Nobeoka and a 60,000-ton-per-year plant at Minamata. The Hamhung Plant was modelled very closely on the Minamata Plant in overall plan and equipment design. The production units were identical in type and scale to those at Minamata, as was nearly all other equipment installed.[38] Total output, however, was to be nearly seven times that of the Minamata Plant, the increase being obtained by multiplying the number of production units. This implied a considerable expansion in the size of Noguchi's corps of skilled technicians.

The scale of the projected Hamhung Plant was remarkable, not only in comparison to existing plants, but in relation to existing demand. In 1926 the total domestic demand in Japan was just under 400,000 tons.[39] As in the same year domestic demand in Korea was only just over 100,000 tons per year, Noguchi must have planned to export a considerable proportion of his output to Japan proper when his plant came on stream in 1930-1931, even though he must have calculated on a considerable upswing in demand in Korea by that time.[40]

The vast compass of Noguchi's vision may be gauged by the range of manufactures and the size of the work force at the Hamhung complex, which later developed much as he had planned. By the late 1930's, Hamhung, in addition to ammonium sulphate, manufactured many other products in quantity. These included drugs, fats, magnesium, aluminum, zinc, calcium carbide, carbon, explosives, aviation fuel, synthetic rubber, and fertilizers other than ammonium sulphate. At this time the town of Hamhung, which had only been a very small village prior to the Noguchi era, had a population of 180,000 of whom 47,000 were company employees.[41]

The huge Hamhung Plant required an enormous source of power. The hydro-electric project on the Pujon Kang was the largest civil engineering work in the Orient at that time. The main dam had a length of 380 metres and a height of 75 metres. The reservoir had a planned area of fully 240 square kilometres and a projected storage capacity of 24 billion cubic feet. An artificial channel of more than 27 kilometres length, partly tunnelled through the dividing range, carried

water from the reservoir to the power stations located on the steep eastern slope of the range.[42] The total planned generating capacity of the four power stations was just over 200,000 kilowatts,[43] though due to water shortages only half of this output was obtained in the earlier stages of development.

As we have noted, while the possible future gains were enormous, the risks taken by Noguchi were high. Could Noguchi have lessened the risks he took? The Russian threat could not be removed, but could not Noguchi have waited a few years until adequate survey data was available and then designed his project accordingly, instead of gambling on unreliable data? The answer is almost certainly "no." There are two reasons.

Firstly, in the mid-twenties Noguchi had an advantage which he was likely to lose if he delayed. By 1926, Noguchi was far ahead of all competitors in the ammonia synthesis industry. In that year he had achieved a total production of 85,000 tons ammonium sulphate from very profitable operations, while his only competitor in Japan, the Suzuki Shōten's Number One Nitrogen, had not attained the stage of profitable operation and would not do so for several years. Noguchi must have been aware that this advantage could not last long. New ammonia synthesis processes were being developed in the West. By 1926 the Fauser and the NEC Processes already existed, the Ude Process was being developed, while in the future the Haber Process might well become available. In Japan, there were now entrepreneurs who might well use these processes. While established capital must have seemed little threat, a new group of

entrepreneurs was moving into action, though as yet its achievements were not striking. There was, for example, Mori Nobuteru of Tōshin Electric, which had a vast surplus of electric power. Then, too, there was Ayukawa Gisuke, who took over the direction of the Kuhara Zaibatsu in 1926. Noguchi had to move almost immediately to forestall these formidable competitors, while he alone possessed considerable operating experience in ammonia synthesis.

Secondly, there was the political situation. By the mid-twenties there were already the first stirrings of that revolutionary activity which was to overthrow Great Zaibatsu power in the early thirties. Noguchi had many political connections, especially with the military in Korea, and he was almost certainly well aware of the beginnings of this revolutionary activity. In the mid-1920's, he probably (and correctly) predicted a speedy overthrow of Great Zaibatsu power and the rise of the military, with a concomitant upswing in military demand and the abandonment of the deflationary policies which had slowed Japanese economic growth in the twenties. Noguchi, therefore, probably reasoned that he must move to establish his chemical complex quickly in order to take advantage of the great change in demand which he foresaw in the not very distant future.

Activity Other Than in Ammonia Synthesis

Let us briefly examine Noguchi's activities during the twenties outside of the field of ammonia synthesis, as these also illustrate his bold pioneering spirit.

Noguchi was the first to follow Kaneko in the establishment of a rayon manufacturing enterprise. While negotiating for the Casale patent rights in the early months of 1921, he investigated an Italian process for rayon manufacture. On return to Japan, he was unable to persuade even the directors of his own group to gamble on a rayon venture simultaneously with the Casale Process ammonia synthesis plant, which the board had already decided upon.[44]

The bold and aggressive Noguchi did not abandon his idea. He returned to Europe in the autumn of 1921 accompanied by the able Uehata Goichirō, the Managing Director of Asahi Artificial Silk Thread, a small but active rayon company which we have previously noted, and bought the Japanese rights to a viscose rayon process from Vereinigte Glanzstoff-Fabriken A.G. The dynamic Noguchi, in an individual relationship with Asahi Artificial Silk Thread, set up a new company—Asahi Silk Weaving—to industrialize the new technology. This company was incorporated in May 1922 with Kita Matazō as President and Noguchi as Chairman of the Board. The plant in Shiga Prefecture came on stream in May 1924 and became a commercial success.[45] Noguchi's rayon interests expanded rapidly during the twenties.

Following the establishment of the fertilizer manufacturing capacity of JNF in the mid-twenties, Noguchi diversified the activities of the company, moving vigorously into the fields of drugs and explosives, and sponsoring a considerable amount of successful research.

We will note some of the more remarkable achievements:

Noguchi invited an engineer from the Ministry of Agriculture and Commerce, Murayama Kyūzō, to Nobeoka to investigate a process for the production of nitric acid by the oxidation of ammonia. Murayama, in some highly significant research, developed an original three-stage process which allowed the manufacture of a product superior to that previously made by the sulphuric acid process. Patents for the new process were taken out in many countries.[46] Utilizing this invention, Noguchi moved aggressively into the manufacture of the explosive ammonium nitrate in June 1928.

In 1927, Hashimoto Hikoshichi of the Minamata Plant, developed a new process for the synthesis of acetic acid, based on the transformation of acetylene derived from calcium carbide. Again, patents were taken out in many countries.[47]

Noguchi also enlarged the mining division, though this was never a success, and it is possible that it was more of a hobby than a serious business enterprise.[48]

IV. SUMMARY

Contrary to the general view, JNF was an independent enterprise after 1921, though it retained considerable financial links with Mitsubishi until 1930. Reflecting Noguchi's bold, dynamic spirit, the firm expanded rapidly, industrializing several new chemical technologies. Noguchi was successful in calcium cyanamide in 1908, in transformed ammonia in 1913 and, most important, in ammonia synthesis in 1923. His construction of the Hamhung ammonia synthesis plant in Korea, which was

of a scale unprecedented in the Empire, was perhaps the greatest feat of Japanese enterprise in the twenties.

JAPAN NITROGENOUS FERTILIZERS

FOOTNOTES

[1]Nihon Chisso Hiryō K.K. Bunshoka, Nihon Chisso Hiryō Jigyō Taikan (Osaka: Nihon Chisso Hiryō K.K., 1937).

[2]Fukumoto Kunio (ed.), Noguchi Jun wa Ikite Iru (Tokyo: Fuji International Consultants, 1964).

[3]Kamoi Hisashi, Noguchi Jun: Ningen to Jigyō (Tokyo: Tōkōsha, 1943), passim.

[4]Katagiri Ryūkichi, Hantō no Jigyō Ō: Noguchi Jun (Tokyo: Tōkai, 1939), passim.

[5]Miyake Haruteru (ed.), Shinkō Kontsuerun Tokuhon (Vol. XI of Nihon Kontsuerun Zensho. Tokyo: Shunjūsha, 1937).

[6]Iwai Ryōtaro, Mitsubishi Kontsuerun Tokuhon (Vol. III of Nihon Kontsuerun Zensho. Tokyo: Shunjusha, 1937), end paper.

[7]Katagiri, op. cit., p. 61; and Shibamura Yōgo, "Noguchi Jun to Kagaku Kōgyō: Nihon Kagaku Kōgyō o Kizuita Hitobito," Kagaku Keizai, December, 1969, pp. 91-92.

[8]Katagiri, op. cit., p. 62.

[9]Kabushiki Nenkan 1920 (Osaka: Ōsaka-ya Shoten Chōsa-bu), p. 510.

[10]Kabushiki Nenkan 1921 (Osaka: Ōsaka-ya Shoten Chōsa-bu), p. 518.

[11]Ginkō Kaisha Nenkan 1928 (Tokyo: Daiyamondo), pp. 220-221.

[12]Fukumoto, op. cit., pp. 62-63.

[13]Mishima Yasuo, "Mitsubishi Shōji: Zaibatsugata Shōsha no Keisei," Keiei Shigaku, 8:22, August, 1973.

[14]Ibid., pp. 22-24.

[15]Ibid.

[16]Nihon Chisso Hiryō, op. cit., p. 79.

[17]Ibid., p. 433; and Kamoi, op. cit., p. 125.

[18]Nihon Chisso Hiryō, op. cit., p. 434.

[19]Ibid., p. 435; and Kamoi, op. cit., pp. 118, 137.

[20]Nihon Chisso Hiryō, op. cit., p. 442; and Kamoi, op. cit., p. 131.

[21]Nihon Chisso Hiryō, op. cit., pp. 441-443; and Kamoi, op. cit., p. 142.

[22]Nihon Chisso Hiryō, op. cit., p. 449.

[23]Ibid., p. 451.

[24]Kabushiki Nenkan 1920, op. cit., p. 511.

[25]Nihon Chisso Hiryō, op. cit., p. 456; and Shibamura, op. cit. p. 93.

[26]Kamoi, op. cit., pp. 175-179.

[27]Ibid., pp. 180-181, 185.

[28]Shibamura, loc. cit.

[29]Kamoi, op. cit., p. 190; and Nihon Chisso Hiryō, op. cit., p. 458.

[30]Ibid., p. 461; and Nihon Ryūan Kōgyō Kyōkai, Nihon Ryūan Kōgyō Shi (Tokyo: Nihon Ryūan Kōgyō Kyōkai, 1968), Table 2-16, p. 136.

[31]Nihon Chisso Hiryō, op. cit., p. 464.

[32]Fukumoto, op. cit., p. 67.

[33]Watanabe Tokuji (ed.), Kagaku Kōgyō Jō (Vol. XIII of Gendai Nihon Sangyō Hattatsu Shi. Tokyo: Tōkōryō, 1968), Table 4-23, p. 400.

[34]Watanabe Sahei and Kitahara Michitsura (eds.), Ginkō (Vol. XXVI of Gendai Nihon Sangyō Hattatsu Shi. Tokyo: Tōkōryō, 1966), pp. 335-337.

[35]Shibamura Yōgo, "Sangyō Shihongata Kigyō no Seiritsu: Shōwa Hiryō no Sōsetsu to Hatten. Jō," Kagaku Keizai, June, 1966, p. 56; and Shibamura Yōgo, "Sangyō Shihongata Kigyō no Seiritsu: Shōwa Hiryō no Sōsetsu to Hatten. Ge," Kagaku Keizai, July, 1966, p. 113.

[36]Nihon Chisso Hiryō, op. cit., p. 445.

[37]Fukumoto, op. cit., p. 68.

[38]Nihon Chisso Hiryō, op. cit., p. 463.

[39]Nihon Ryūan Kōgyō Kyōkai, op. cit., Table 5-4, p. 775.

[40]Watanabe Tokuji, op. cit., p. 398. The demand for ammonium sulphate in Korea in 1926 is obtained by reducing the demand in Korea in 1932 in the same proportion as the decrease in demand for ammonium sulphate in Japan proper in 1926 as compared to 1932.

[41]Shibamura, December, 1969, op. cit., p. 95.

[42]Nihon Chisso Hiryō, op. cit., pp. 467-470.

[43]Ibid., p. 318.

[44]Kamoi, op. cit., pp. 183, 198.

[45]Fukumoto, op. cit., p. 49; and Shibamura, December, 1969, op. cit., p. 94.

[46]Fukumoto, op. cit., pp. 46-47.

[47]Ibid., p. 47.

[48]Ibid., pp. 133-134.

CHAPTER VI

SHŌWA FERTILIZERS

I. INTRODUCTION

The rise of the Mori empire was meteoric. While its first arm, Japan Iodine, was not formed until 1926, the main branch, Shōwa Fertilizers, grew with great rapidity from its founding in 1928. By 1939 the Mori Combine controlled a group of companies with assets valued at no less than 330 million yen and it ranked seventh in size among Japanese enterprises. In that year, the combine was heavily concentrated in the chemical (thirty-nine per cent) and electricity-gas (thirty-six per cent) industries, as estimated by proportions of total paid-up capital.[1] Its rise was a consequence of both the bold, dynamic leadership of Mori Nobuteru and the great determination and expertise of his technicians.

II. MORI'S EARLY CAREER

Mori commenced his career in the chemical industry at the age of twelve, when he started to help his mother in the gathering and burning of kelp.[2] The ash was collected by the iodine manufacturers for use as a raw material. After the death of his mother, he continued in these activities until 1901 when, at the age of seventeen, his father sent him to a nearby factory to learn iodine manufacture itself. Mori proved to be an apt pupil and was soon put in charge of a family iodine manufacturing operation founded by his father.[3]

After the Russo-Japanese War, the Japanese iodine industry was hard-hit by foreign competition, and the Mori family enterprise merged with a number of others in 1908 to form Bōsō Marine Products. Mori was initially appointed Operations Manager and was promoted to Managing Director in 1910—a considerable achievement for a man of only twenty-six years of age.[4]

While the firm prospered in the World War I boom, Mori was to suffer in the depressed conditions of the post-war period. In 1919 Bōsō Marine Products went bankrupt and was absorbed by Tōshin Electric, which was largely under the control of Mori's former rivals in iodine manufacturing—Suzuki Saburōsuke and his brother Chūji. Tōshin Electric produced electricity for general sale and also manufactured potassium chlorate for match heads. The firm had been established in 1917 by the Suzukis, in collaboration with Takahashi Tamotsu of Nagano Electric Light. Mori became a director and was placed in charge of construction. The Japanese match industry suffered intense competition from the International Match Trust headed by Kreugel and, in 1921, Tōshin sold its bankrupt potassium chlorate operation to the associated company, Tokyo Electric Light.[5] Mori, who was connected with the chemical branch up to this time, was adversely affected by this move.

Mori, however, remained uncrushed by his defeats. He must have played a considerable role in Tōshin in the early twenties because he came to occupy a position equal to that of the Suzuki brothers and Takahashi when the firm was reformed with a nominal capital of eleven

million yen in November 1925. In October 1926, while retaining his directorship in Tōshin Electric, Mori re-entered the chemical industry with the founding of Japan Iodine. The new firm which took over the facilities of Bōsō Marine Products and manufactured iodine and other chemicals was very small at first, having a capitalization of only 500,000 yen.[6] Mori, however, was soon to proceed to much larger undertakings.

III. THE ESTABLISHMENT OF SHŌWA FERTILIZERS

Although Tōshin Electric had commenced the sale of wholesale electricity to the distributing company Tokyo Electric Light in 1925, the future of the generating company was by no means secure. Rapid development of Japan's hydro-electric potential, combined with the generally rather sluggish industrial growth rate, caused a surplus in electricity supply, which lasted from the mid-twenties until the start of the manufacturing boom in the early thirties. In these circumstances, Tōshin Electric was faced with a continuing unsalable surplus of electricity.

Mori was by far the most active of the directors in searching for some means to market this excess. Although he had considerable experience in small-scale chemical manufacturing, he had no formal technical training, and he pondered for some time, seeking advice widely, before committing himself. He investigated aluminum manufacture which required a large input of electricity, but decided against it, as the technology was little known in Japan.[7]

Mori decided to set up two fertilizer plants operated by a new company, Shōwa Fertilizers, to utilize the perennial electricity surplus. One, a calcium cyanamide plant to be sited at Kase in Niigata Prefecture, was unremarkable. The other was a daring venture. It was to be an ammonia synthesis plant for the manufacture of ammonium sulphate, sited at Kawasaki near Tokyo.[8]

This new venture represented an entirely new level of risk for Mori. To be sure, he had taken a degree of risk before and had suffered when the companies with which he had been associated failed, but this new enterprise was a much greater commitment. Mori was now not simply a prominent member of a controlling group, but was becoming an individual prime mover who risked his reputation and his future on one throw of the dice.

Shōwa Fertilizers was incorporated in September 1928 by the two founding directors, Mori and Suzuki Saburōsuke, with an authorized capitalization of ten million yen. Suzuki played almost no part in the establishment of the new firm. He was ill during the construction of the plant and died a few days before synthesis was achieved.[9] According to a contract, the capital was to be found in equal proportions by Tōshin Electric and its associated electricity distributor, Tokyo Electric Light, but in practice neither of these firms had sufficient funds to make any contribution whatsoever to the financing of the Kawasaki Plant. Tokyo Electric Light agreed, in lieu of funding, to supply the completed plant with electricity at reduced cost. Tōshin Electric did contribute some funds to Shōwa Fertilizers, but these were

entirely consumed in the construction of the cyanamide plant at Kase.[10]

When he established Showa Fertilizers, Mori must have expected financial backing from Mitsui (see page 421), as only with the prospect of support would he have proceeded as he did. In the autumn of 1928, Tōshin Electric, in association with Daidō Fertilizers and the South Manchurian Railway Company, investigated the very expensive Ude Process and, for a time in early 1929, seemed about to share the Japanese rights of the cheaper Fauser Process with Japan Artificial Fertilizers. Use of the Ude Process and related equipment would have cost fully eight million yen, while even the adoption of the cheaper Fauser Process would have cost three million yen.

Given financial backing, Mori could have adopted a foreign ammonia synthesis process. Yet Mori did not adopt a foreign process. Did Mitsui withdraw financial support, or did Mori decide not to rely on Mitsui? It is probable that Mori rejected Mitsui, as Mitsui continued to offer its marketing facilities to Mori until late in 1930 (see page [illegible]). In making this decision, Mori was undoubtedly influenced by three factors: a desire to remain independent of Mitsui, a conviction that a commercially viable plant could be established utilizing the TIES ammonia synthesis technology; and the knowledge that by 1930 chemical equipment could be purchased with very little down payment. The wish to stay free of Mitsui's control was probably of long-standing, but the other two factors were not. The directors of Toshin Electric were little perturbed, on receipt of the news in February 1929 that they could not utilize the Fauser Process, and it is highly probable that they had already decided

to use the TIES technology. It seems almost certain that Yokoyama, who played the principal role in the development of the ammonia synthesis process at SNRS, persuaded Mori and Takahashi, Tōshin Electric's technical representative in Europe in 1928, of the viability of the process during the autumn of that year. The availability of chemical equipment on very small down payments had come about due to the very depressed state of Japanese manufacturing after the Bank of Taiwan Crisis of 1927. By 1929, equipment manufacturers, desperate for orders, were prepared to build machinery for very low down payments. Prior to the slump, contracts with manufacturers called for down payments of thirty to fifty per cent of full price, but with the advent of the slump down payments became almost nominal.[11]

The audacity of Mori's plan is startling. He not only proposed to build a plant almost without funds, relying on manufacturers' credit, but also to use untested Japanese ammonia synthesis technology. The construction costs of the plant were probably met from a small private fund of Mori's, as he was unable to obtain financial backing of any kind until after the completion of the plant, when he finally obtained 500,000 yen from a life insurance group.[12]

Mori's courage in the execution of his plan is all the more remarkable considering the hostile scepticism of Japanese industrial circles toward the entire project. Industry did not believe that Japanese technology had progressed to the point where it could independently develop a modification of a foreign ammonia synthesis process.[13] Noguchi Jun, who was the most bitter critic, went so far as to say that

he would cut off his own head if Mori so much as produced a smell of ammonia at the Kawasaki Plant.[14] The scepticism of the industrial world was parallelled by an equal coldness in financial circles, and it was this which made funding impossible to obtain.

Mori did not flinch, and his two principal technicians remained resolute. Construction of the plant started in August 1930.

Yokoyama and Nakamura, the two leading technicians, were transferred from TIES to Shōwa Fertilizers in April 1929 to provide technical leadership at the site. Not only in industry but within TIES, many were highly critical of the use of Japanese technology, and Nakamura is recorded as saying that only his wife was truly sympathetic at this time.[15] Yokoyama and Nakamura were aided by Shibata Katsutarō and other technicians from TIES in the construction and trial operation of the Kawasaki Plant.[16]

It is of interest that Yokoyama and Nakamura willingly exchanged roles by taking positions with Shōwa Fertilizers. Though drawing heavily on previous experience, they were essentially changing fields by entering the firm, as they moved from research to production technology. Such technicians, prepared to play leadership roles in the industrialization of the technology which they had developed, were of inestimable value.

Number One Unit at the Kawasaki Plant was completed in March 1931. Production for 1931 totalled 46,630 tons of ammonium sulphate, while in 1932, 130,000 tons were manufactured.[17]

At first, there was considerable difficulty in obtaining ammonia at the plant. The catalysis tower at Kawasaki, unlike the small tower of the pilot plant at SNRS, was only heated internally, with the result that the relative heat input was less. Not only was the heat input lower, but the gas flow was greater, as gas pressure had been stepped up from the pilot plant pressure of twenty atmospheres to fifty atmospheres. On April 1st, after many unsuccessful attempts to start synthesis, pressure was dropped to twenty atmospheres and the temperature rose in the tower for the first time. On April 3rd synthesis was finally achieved and, from that time on, the plant moved steadily toward full-scale production.[18]

During the construction and start-up of the plant, the technicians Yokoyama and Nakamura had shown great drive, stamina and courage. They had borne the strain not only of an arduous task, but also of hostile opinion. By early April they were exhausted. Once synthesis had been attained, Nakamura collapsed and was forced to take a period of rest, while Yokoyama's weight had fallen from 116 pounds at the start of construction to 80 pounds by early April.[19] The success of the Kawasaki Plant owed much to the fanatical determination of these two men.

Nowhere was the spirit of the New Japan more in evidence than in the establishment of the Kawasaki Plant in 1930. This plant is a monument to the entrepreneurial audacity of Mori Nobuteru and the skill and courage of Yokoyama and Nakamura. The huge plant had no antecedents within Shōwa Fertilizers. Unlike the long-sustained growth of Noguchi's industrial empire, it appeared suddenly on the Japanese industrial

landscape, almost as if by magic, in response to one colossal effort of Mori's will. His vision was translated into physical reality by his own entrepreneurial genius and the Herculean labours of the technicians. This then was the New Japan, which fearlessly sought to expand the self to its widest limits, which toiled unflinchingly and incessantly to transmute its dreams into reality, and scorned anything which sought to hinder the blazing determination of its advance.

SHŌWA FERTILIZERS

FOOTNOTES

[1]Japan Manchoukuo Yearbook (Tokyo: The Japan Manchoukuo Yearbook Company, 1940), p. 1140 and adjoining diagram.

[2]Kimura Takeshi, Shiroi Sekitan (Tokyo: Shikisha, 1953), pp. 102-103.

[3]Shibamura Yōgo, "Mori Nobuteru to Denki Kagaku Kōgyō: Nihon Kagaku Kōgyō o Kizuita Hitobito 25," Kagaku Keizai, May, 1970, p. 93.

[4]Ibid.

[5]Shibamura Yōgo, "Sangyō Shihongata Kigyō no Seiritsu: Shōwa Hiryō no Sōsetsu to Hatten. Jō," Kagaku Keizai, June, 1966, p. 56.

[6]Ibid.

[7]Shibamura, May, 1970, op. cit., p. 94.

[8]Ibid., p. 95.

[9]Ibid., p. 97.

[10]Shibamura, June, 1966, op. cit., p. 57.

[11]Ibid., p. 58.

[12]Ibid., p. 57.

[13]Ibid.

[14]Statement by Saitō Tatsuo, an engineer formerly employed by Shōwa Fertilizers. Personal interview, Tokyo, October, 1972.

[15]Tōkyō Kōgyō Shikken Jo, Tōkyō Kōgyō Shikken Jo Gojū Nen Shi (Tokyo: Tōkyō Kōgyō Shikken Jo, 1951), p. 226.

[16]*Ibid.*

[17]*Ibid.*, p. 227.

[18]*Ibid.*, pp. 226-227.

[19]*Ibid.*, p. 227.

CHAPTER VII

THE ENTREPRENEURS OF THE RISING COMPANIES

I. INTRODUCTION

We have demonstrated something of the achievements of the entrepreneurs of the rising companies in their obsessive quest for business empire. Their spirit, their goals, and their accomplishments were similar. What of their origins? Were they the product of a particular social class, region or educational process? What was the spring of their great drive to construct? Was it a conscious desire to serve the state or their fellow-man? Or again was it a subconscious urge implanted in childhood? As individuals what were their entrepreneurial strengths and their particular styles of operation? And how did they come to develop these strengths and styles? Let us seek answers to these questions in a comparative study of the lives of these remarkable men.

II. FAMILY AND HOME BACKGROUND

The three entrepreneurs came from families which were very different in social standing, circumstances and area of origin. Kaneko Naokichi was born in the castle town of Kōchi in Tosa Han (now in Kōchi Prefecture) in 1866. Though the Kaneko family had once been prosperous merchants, their fortunes had declined and, by the time of Kaneko's birth, both the father and mother were employed in menial trades.[1] Mori Nobuteru, born in 1884, was the eldest child of a small, but

locally prominent businessman, who lived in a coastal village in the Bōsō Peninsula of Chiba Prefecture about sixty miles from Tokyo. The family patriarchs had, at times in the past, held the position of village headman. At the time of Mori's birth, the family had a diversified business; they operated a fishing boat, dealt in rice and miscellaneous goods and ran a pawn shop.[2] Great as was the social gulf between the successful village bourgeois Mori and the near lumpen-proletarian Kaneko, an even greater distance in social standing existed between Mori and Noguchi. Prior to the advent of social mobility, which characterized the period of rapid economic advance after 1933, Japanese society fell into two broad classes—the gentry and the "common people." The Mori family, for all its solid if not great wealth, were not gentry; the Noguchi family were gentry of fairly high rank. Noguchi Jun, the eldest child of a samurai of Kaga Han, was born in the Han in 1873, but the family soon moved to the new capital of Tokyo, where his father became a comparatively wealthy government official. Noguchi grew up within the compound of the former daimyo of the Han, where his family had their residence.[3]

The degree of formal education received by the three entrepreneurs was in close proportion to their social rank at birth. Since his family was so poor, Kaneko's only schooling was some two years' instruction in the writing of the characters by the odd-job man at a local shrine. His education was considerably less than that of almost all the rest of the neighbourhood children, who had attended primary school, and this disparity in schooling gave him a sense of inferiority, which

for a time at least set him apart.[4] Thus, even within the low social stratum of his birth, Kaneko was something of an outcast. Thanks to his rather intellectual father, Mori received somewhat more education than most children of his time, as he graduated from a higher primary school,[5] while the aristocrat Noguchi graduated in electrical engineering from the Imperial University at Tokyo, then an even more highly elite institution than at present.[6]

Disparate in social origin and level of education though they were, all three had one thing in common: an unusually close relationship with their mothers. While descriptions of Kaneko's childhood are less detailed than is the case with the other two entrepreneurs and stress the poverty of the family rather than the relation with the parents, there can be no doubt that the mother dominated the family and that she was close to her children.[7] Mori was exceptionally close to his mother. He commenced his working career by assisting her in the collection and burning of kelp for iodine manufacture.[8] Noguchi, too, was very close to his mother and throughout her life, if she were sick, he travelled straight to her without sleeping. On return from his third trip to Europe, after disembarkation at Yokohama, he went straight to his mother at Hiroshima without making an overnight stop. This was a considerable journey at that time.[9]

Typically, for all three entrepreneurs, the father was a more distant figure. Kaneko's father was basically weak, though well disposed towards him; Mori's was forceful and, at times, overbearing; while Noguchi and his father were temperamental and moral opposites and

continually in violent conflict, as the father sought to restrain the son's bullying and lying.[10]

III. EARLY BUSINESS CAREERS

As with education, the early business careers of the three entrepreneurs closely reflected the differences of family rank. Kaneko started full-time work at the age of eleven, collecting and selling scrap paper, perhaps the lowest rung on the trader's ladder. After experience in a wholesale shop, he entered Nakamura Trading, a very small firm in Kōchi, where he gained experience in sugar sales and, more important, in pawn-broking. It was pawn-broking that gave him invaluable experience in quick business calculation and lightning assessment of character.[11] The village bourgeois Mori gained a very thorough knowledge of the iodine manufacturing business, which his father had initiated. Mori started by physically performing all the operations of collecting and burning kelp himself, but later as the business expanded he ceased to do this and developed considerable skill in job supervision and in business matters, such as the letting of contracts for kelp burning. At this last activity, he was the acknowledged master of the district. By 1910, at the age of twenty-six, he was already the managing director of a company which had been formed by the amalgamation of a number of small Bōsō Peninsula iodine manufacturers.[12] Noguchi's career up to 1906, when he founded Soki Electric, was unusual for a graduate of the Imperial University. Instead of taking a position in a prestigious firm and keeping it virtually for

life, Noguchi sought to gain wide experience by working for a variety of companies. Thanks to his rank, he was able to gain entry to the prestigious German firm Siemens, then a large military supplier to Japan, where he gained polish as an engineer and developed managerial skills.[13] Contacts made at Siemens were later to facilitate Noguchi's importation of European chemical technology into Japan.

IV. THE ORIGIN OF THE DRIVE TO CONSTRUCT

The strong desire of the three entrepreneurs to build is amply evidenced by their audacity in risk-taking where the possible gains were high, and by their ceaseless expansion into new fields as old ones were conquered. Their tremendous general level of exertion affords further proof.

All three entrepreneurs had tremendous energy. Kaneko, even before he joined Suzuki, always worked very long hours and, during the time he spent in the pawn-broking business, he seems to have worked during the day and then read nearly all night, taking little sleep.[14] Noguchi's great work drive is well-evidenced by his tireless exertions in establishing the technologically novel calcium cyanamide plant at Minamata in 1908, when he scarcely ate or slept.[15] He slept at the plant and often jumped out of bed as an idea occurred to him, to make a note or to effect some change in the machinery of the plant then under construction. Mori was perhaps the most tireless of the three: all sources stress his formidable energy. One notes that, in his early period in the iodine industry, he was never beaten at work which

required only straight physical effort, while according to another, treating his later career, he never knew fatigue.[16] As president it was Mori's habit to hold directors' meetings early in the morning before breakfast, even when the directors were travelling by train between Tokyo and a distant plant.

What were the origins of the entrepreneurs' great desire to build? Was it a product of militant nationalism, or a desire to strengthen Japanese industry so that the nation could match the economic strength of a hostile West? Or did it stem from an altruistic desire to serve their countrymen by increasing living standards, and allowing the fulfillment of their ambitions by creating new industries and upgrading technical levels? Or, again, was the entrepreneurs' passion for construction unrelated to such rationally conceived goals? Was the urge to build emplaced in their psychology by the circumstances of their early life? We can only speculate.

Nationalism in the sense of a desire to promote Japanese interests in conflict with the interests of other nations does not seem to have been a powerful basic motivation in the case of two of our entrepreneurs, while for the third it was probably not the dominant motive.

Kaneko probably felt little antagonism towards Westerners. He learnt from them readily when he felt they had something to teach and even employed them as key personnel in his overseas trading ventures.[17] To be sure, there was friction between the foreign staff and the Japanese within the Suzuki subsidiary Japan Trading prior to World War I, but this was unconnected with Kaneko and seems to have been a consequence

of differing business traditions, rather than international antagonism or racial prejudice. It is noteworthy that Kaneko had the greatest liking and respect for Westerners of exactly those nations which could be regarded as the most serious threat to Japan. According to his only full-length biography,[18] Kaneko regarded those British, Americans and Germans who came from the principal business centres of their respective countries as the most honest and benevolent, while he characterized Indians, Chinese and Eastern Europeans as tricky and inhuman. We find no echo here of Kita Ikki's call for an anti-Western crusade.

Kaneko showed little interest in the defence industries. Japan Explosives Manufacturing was the only Suzuki enterprise directly related to arms production. The glycerine producer, United Fats and Glycerine, appears to have sold exclusively on the civil market.[19]

Noguchi, too, probably lacked a sense of hostility toward the West. While Noguchi clearly associated with Westerners to further his own interests, he appears to have had no resentment towards them. Noguchi, who was extremely quarrelsome and not infrequently drunk, could not have worked with Westerners had he felt a sense of antipathy towards them, as he could not have concealed his feelings. As we have noted, during his early business career, he was employed for a time by the German firm Siemens where he was particularly close to his supervisor Kessler. Between 1908 and the early 1930's, Noguchi spent a considerable amount of time in Europe, seeking new technology. He appears to have cooperated smoothly with Westerners and learnt gladly from them. He displayed none of that paranoid sense of inferiority towards them, which

characterized the behaviour of his early friend and later rival—Fujiyama Jōichi. Fujiyama refused to employ people who had studied in the West and insisted on changing Western processes to conform with his own eccentric ideas.[20] Noguchi's visits to Europe were so frequent that one wonders if all of them were necessary to his business, or if he simply enjoyed being in Europe. Noguchi, too, gloried in his role as an agent of technology transfer between a superior West and an inferior Japan. It is hard to believe that he could have played this role with such zest had he been anti-Western.

Noguchi displayed little activity in war-related industries until the late twenties, when he initiated research on the oxidation of ammonia to produce nitric acid.[21] While this may in part have been due to the difficulty of securing government contracts, it probably also reflected Noguchi's lack of an anti-Western bias.

We have argued that Noguchi was somewhat pro-Western prior to the late 1920's. From that time on, he moved steadily closer to revolutionary sections of the military. Does this imply a swing in his basic philosophy? Almost certainly not; there is a far more likely explanation. Noguchi's pro-Western sentiments were probably relatively mild; by far his greatest passion was the building of his empire. For Noguchi, association with the military offered survival and unparallelled expansion. Non-association meant stagnation at the best and suppression by the Great Zaibatsu at the worst.

At no period in Noguchi's life is it probable that anti-Western nationalism was a powerful motivation.

Mori Nobuteru, unlike Noguchi, probably was anti-Western, but it is doubtful if this was his principal motivation in business, as several Japanese writers have claimed. Suzuki, for example, writing in 1937,[22] stresses that during the 1920's it was Mori's over-riding ambition to revenge himself on Westerners for the double bankruptcy he had suffered at their hands, by driving foreign products from Japanese markets. Suzuki, however, writing at a time of violent anti-Western nationalism, may well have simply taken at face value propaganda designed to establish the fervent patriotism of the Mori Combine. Statements similar to Suzuki's have appeared recently in the semi-literary magazine Bungei Shunjū[23] (Literary Arts), but here they reflect the grossly chauvinistic viewpoint of the editorial staff and an uncritical repetition of material by pre-World War II writers, rather than any dispassionate evaluation of historical evidence.

Mori at the age of twenty was no strong patriot. When faced by the draft board during the Russo-Japanese War of 1904-1905 with patriotic fervour at its height, he showed considerable skill at evading conscription. Due to the effects of smoke from the seaweed burning, he had some symptoms of inflammation of the chest membranes which were noted by the examining doctor. When Mori was questioned about these symptoms, he lied coolly, saying it was due to the after-effects of pleurisy. He was rejected as physically unfit.[24]

Later experiences, however, may have changed his outlook. In the period following World War I, first his iodine manufacturing business and then the match venture with which he was related were bankrupted by the

pressure of foreign competition. Certainly, he showed bitterness towards the Swede Kreugel, the Head of the International Match Trust, as he is reported to have remarked regretfully on hearing of Kreugel's suicide in Paris that he would have liked to have broken Kreugel's nose before he died. Mori associated little with Westerners. Unlike Noguchi, he visited the West rarely, in spite of the rapid expansion of the technical base of his firm after 1930. Mori's political connections, too, strongly suggest an anti-Western orientation. In the early twenties, Mori had political ambitions and became a member of the Seiyūkai where he supported the well-known politician Yamamoto Jōtarō, the leader of the most nationalistic section of the party.[25]

Certainly a case can be made by the mid-twenties that Mori was an anti-Western nationalist, but it hardly seems likely that this was the principal motivation for his entrepreneurial activities. It cannot seriously be argued that Mori embarked on the establishment of the Kawasaki Plant simply to introduce the ammonia synthesis industry to Japan, as there were already several such plants in the country. Similarly, it is highly unlikely that Mori utilized Japanese technology at Kawasaki simply due to patriotism. Japanese technology, which could be obtained from the government without a patent fee, also did not require the concomitant purchase of expensive Western equipment. It was, thus, very much cheaper than a European technology.[26] It is highly probable that Mori acted simply to build an industrial kingdom for himself.

Mori, like Noguchi, became closely linked with the military, but his first contacts were not made until the early 1930's, as his rise was later than Noguchi's. In the case of Noguchi, we have said that the connection was motivated by need and not nationalistic sentiment, but with Mori it is probable that need and nationalism complemented one another, although nationalism was probably the lesser influence.

Were the three entrepreneurs motivated by an altruistic desire to serve their countrymen? Noguchi and Mori do not seem to have been credited with such motivation, but Kaneko has been regarded as at least something of a philanthropist.

Noguchi seems to have had little feeling for his countrymen and even less for Koreans. His attitude is most clearly shown in the marketing of the calcium cyanamide from the Minamata Plant in the pre-World War II period. Calcium cyanamide is difficult to apply as a fertilizer, as under certain conditions it can cause withering and death of the plants instead of aiding their growth. The management and employees of JNF had little knowledge of the mode of application of their product and there were a number of cases where use of the fertilizer was followed by very serious damage, as, for example, at Hatano in Kanagawa Prefecture.[27] In spite of a number of instances where application had proved disastrous, Noguchi appears to have made little attempt to obtain information on the mode of application, or to inform salesmen and farmers. Instead he pressed ahead with sales.

Even Noguchi's most laudatory biography[28] comments on the existence of a volume of opinion hostile to Noguchi. One magazine

attacked Noguchi, stating that, while he was performing excellent service in establishing military industries in Korea, he was cruel, reckless and inhuman in his treatment of people. A further article in another magazine evaluated Noguchi as the most miserly figure in the entire Japanese financial world.[29] Even members of his immediate family concurred in this judgement on his meanness.[30] In Korea, it was said that "Where Noguchi passed, the grass did not grow again."[31]

While it is only fair to point out that the leader of JNF had some redeeming qualities in close relations with his employees, his attitude to the general mass of people was undoubtedly uncharitable to say the least. It is highly unlikely that such a personality would have built an industrial empire in order to serve the general mass.

Those who have written on Mori, though of widely differing backgrounds, have said almost nothing of his general attitude to his countrymen. They have neither branded him as a demon like Noguchi, nor praised him as a minor saint like Kaneko. It seems probable that Mori had no marked propensity to aid his countrymen.

Kaneko has been credited with an altruistic desire to promote the public welfare. Does this reputation accord with reality, or is it simply a myth designed to establish Kaneko as a kind of Japanese Robin Hood; a kindly champion of the poor against the oppression of established wealth, as Mori has been fixed in legend as a crusading hero against the West?

We may discount the evidence of the contributions which Kaneko made to public charity after the Rice Riots of 1918 as simple image

building. Kaneko's donations to relief at the time of the Great Tokyo Earthquake also fall into this category.[32]

There is certainly some evidence of a strong egalitarian inclination in Kaneko. As we have already noted, according to one source, a reason for Kaneko's interest in the rayon industry was the impulse to reduce social discrimination.[33] Within the Suzuki Shōten itself, on every working day, all employees from directors down to the very lowest ranks, ate the same three company-supplied meals in a common dining hall. A wish to upgrade the living standards of the poorer Japanese workers may have inspired the payment of wage rates at the Yonezawa Experimental Rayon Plant which were well above the local average,[34] though it is possible that these rates were designed to hold workers of above-average skill. Then, too, Kaneko is said to have "talked like a socialist" at times when he became excited. This, too, suggests a strong, genuinely egalitarian strain in the leader of Suzuki.

Kaneko did emerge on at least one occasion as the champion of the underdog, when in the face of the wrath of the powerful Mitsui he came to the defence of a small creditor in the Japan Sugar Refining Incident of 1909.[35] Suzuki, too, seems to have deliberately avoided the oppressive finance business in which the Great Zaibatsu were heavily involved,[36] and the firm did not corner rice when the price was rising rapidly in 1918.

Shiroyama, in an extensive investigation of the company's activities in Kobe prior to the Rice Riots of 1918,[37] found little evidence of oppressive practices by Suzuki. One possible exception is

the case of the group of wheat dealers who claimed that they had been forced to sell at an unfairly low price to Suzuki early in 1918.[38]

There is strong though rather intangible evidence of Kaneko's benevolent attitude, at least to those within the firm, in the goodwill borne towards Suzuki today by former employees and their relatives whose association still meets regularly and publishes the magazine Tatsumi.

Our image of Kaneko, like that of Noguchi, is formed largely by laudatory biographers. Those who wrote about Noguchi, while stressing his colossal achievements, felt compelled to at least note his striking deficiencies. Kaneko's biographers, including the detached Shiroyama, all wrote after the death of Kaneko when a more objective approach could be taken. Yet, they have not felt compelled even to mention oppressive practices or unfavourable opinion. It is probable that part of Kaneko's great drive to construct stemmed from a desire to serve his countrymen.

In our discussion so far we have decided that none of the three entrepreneurs was principally motivated by bellicose nationalism and only one, Kaneko, was partly motivated by an altruistic desire to promote the general welfare. Let us now turn from a consideration of rational motivation to irrational drives. We shall proceed by searching for common factors in the background and physical characteristics of the three entrepreneurs. As we shall see, the utter dissimilarity in nearly all respects is striking.

The three men were highly disparate in social status at birth, degree of family security during childhood, and in type and level of education. They originated in entirely different areas of Japan and

from different types of community. Mori was raised in a Kantō village, Kaneko in a smallish town in Shikoku, while Noguchi grew up in Tokyo among his fellow clansmen of Kaga. The three entrepreneurs were significantly different in age, Kaneko the eldest being of a different generation from Mori the youngest. There is nothing common in their early work experience. Kaneko had trade forced upon him by necessity; Mori was heir to the modest business activity of his family, while Noguchi chose the profession of electrical engineering.

Physically, too, they were entirely dissimilar. Kaneko was short and frail, though possessed of seemingly inexhaustible mental energy. He always used his pocket heater even in summer and was perpetually worried about his health,[39] though he lived to the age of seventy-nine. Noguchi was short, but of robust constitution, although he suffered a serious illness in his late forties. Mori was strong and physically tireless, as amply shown by his Herculean labours in the early days of his iodine business.

As we have noted, the three entrepreneurs had widely differing relationships with their fathers. Kaneko's father was rather passive, though well disposed towards him, while Mori's was rather cold and remote. There was a violent antipathy between Noguchi and his father. In contrast, all three entrepreneurs were very close to their mothers, and it may be that this close mother-son relationship was the origin of the ferocious kingdom-building activity of the three entrepreneurs. According to a recent theory, debt repayment to the mother may well be a potent factor in the determination of the strong work drives displayed

by the Japanese.[40] The Japanese seem to conceive the care and love lavished on a child as a form of moral debt which can only be repaid by a life of socially-approved achievement in some form. Thus, the three entrepreneurs, possibly, sought to repay the debt to their mothers by sustained achievement in business.

While this is a possible explanation, the origins of the desire to achieve may have lain elsewhere. We do not have sufficient information to give anything but a tentative explanation.

V. MAIN STRENGTH AND OPERATING STYLE

Each of the three entrepreneurs had his particular type of strength and operating style.

Kaneko had two particular fortes.

Firstly, he was beyond anyone else in Japan the master of intelligence. His network collected, and he interpreted, all kinds of information—political, social, industrial and commercial—which might have a bearing on business. During World War I, at least, the day-to-day operation of this network was under his personal direction, and messages were brought directly to him by messenger boys from the telegraph office, not relayed by subordinates. So speedy and accurate was his intelligence that even the foremost newspapers in Japan frequently came to Suzuki for information.[41]

Secondly, in contrast to the leadership of the established companies, he had a consistent industrial strategy. He sought to pioneer the development of the growth industries in Japan, moving at

an early date into rayon, ammonia synthesis, celluloid, synthetic dyes and glycerine in the chemical industry. In the field of mechanical engineering Kaneko was among the leaders in the development of the diesel engine and high-pressure gas equipment. He was also one of the pioneers of insurance in Japan.

Kaneko was little concerned to preserve a Suzuki image of dignity and honest dealing. Perhaps more than either of the other two entrepreneurs, Kaneko emphasized speed of development and cheapness, rather than certainty of success in developing a new industrial field. The near chaos which occurred at times at Yonezawa does not seem to have disturbed him. Kaneko, too, did not hesitate to acquire information by industrial spying, an underhand method which was not employed by either Noguchi or Mori, and seems to have transgressed the law of Japan when he felt it necessary. During his very early career when he was in pawn-broking, he appears to have falsified accounts,[42] and he seems to have been involved in a serious scandal concerning Japan Sugar Refining in 1909. Isomura Ototsuke, the early patron of Nakano Yūrei, the builder of Japan Soda, obtained 80,000 yen from Kaneko after serving a prison sentence for complicity in this scandal. It appears that Isomura had remained silent about Kaneko's involvement in the affair.[43] This side of Kaneko was almost undoubtedly a product of his very humble beginnings, when dishonesty was necessary for survival.

Kaneko, in one project at least, supervised rather closely. In the development of a process for viscose rayon, besides deciding when a major step in development was to be taken, he also gave general

guidance and forced the pace of activity.

Noguchi had three main fortes.

It was Noguchi's great technical ability and judgement which allowed him to build up such a commanding lead over his competitors in ammonia synthesis by the mid-twenties. In the area of the purely chemical industries, Noguchi moved earlier than others and always successfully. He was correct in his technical judgement to industrialize the Frank and Caro Process, the transformed ammonia process and the Casale Process.

Noguchi had the ability to make a colossal gamble on one throw of the dice, if the stakes were sufficiently high. His move into Korea was such a gamble.

The leader of JNF had a sure feel in political matters, as evidenced by his early association with the military in Korea.

Mori, like Noguchi, had the capacity to gamble for high stakes. In establishing the large Kawasaki Plant of Shōwa Fertilizers, he gambled that the unproven Japanese technology utilized by the plant would be viable, and also that he could market his product in the face of savage foreign dumping and the possible opposition of Mitsui. Like Noguchi, Mori, too, seems to have had a keen political sense. It is probable that Mori only gambled on such apparently unfavourable odds in the Kawasaki venture, as he was able to forecast the imminence of a radical change in economic policy.

The leader of Shōwa Fertilizers lacked any depth of technical knowledge concerning ammonia synthesis, much less Noguchi's formidable grasp of that complex field. Mori's role was that of prime mover and

coordinator. In the establishment of the Kawasaki Plant, he arranged finance, organized a sales outlet, and coordinated the construction work. He did not, however, force the pace in the way that Kaneko did at Yonezawa or Hiroshima.

VI. SUPPORTING ASSETS

While their capacity in risk-taking, often in the face of public ridicule, amply testifies to the moral courage of the entrepreneurs, we know much less of their physical courage. Kaneko seems to have shown little fear in the immediate aftermath of the Rice Riots in Kobe, even though the agitators were still active and there was a price on his head.[44] Noguchi, though adopting a bullying and blustering manner in personal relations, may have lacked physical courage. While at first he took a very firm line with the workers in the strike at the Kagami Plant during the Rice Riots, he at once acceded to their demands when he heard that armed workers were planning action.[45] Of Mori we know little. His evasion of the draft was probably due to a desire to avoid the monotonous and mind-killing life of an ordinary soldier rather than to physical cowardice.[46]

Of the three entrepreneurs, at least Kaneko and Noguchi had remarkable business sense; they knew how to maintain an enterprise on a profit-making basis. Noguchi was quick to reduce costs. He detested waste in any form, could swiftly detect extravagance in the expenditures of companies under his control and achieve cost reduction through its elimination. This is well-exemplified by his anger when he saw a

varnished door instead of a plain one installed at the Minamata factory, which he interpreted as a sign of general extravagance at the plant.[47] Kaneko, too, showed strong cost consciousness. While the work of Hata at Yonezawa on viscose rayon was still at an experimental stage, though a rough but salable product had been made, Kaneko insisted that costs be recorded and cost-cutting attempted. He thus shifted the spirit at Yonezawa from that of a laboratory to that of a business enterprise.[48]

Of the three entrepreneurs, Kaneko and Mori had great skill in several forms of human relations, but Noguchi does not seem to have possessed any special skill. In this connection, it is noteworthy that both Kaneko and Mori had early political ambitions. Kaneko abandoned his very early in life without ever entering politics, realizing that he would never rise above the rank and file. Mori, on the other hand, was for some time a low-ranking member of the Seiyūkai, but in spite of his basic inclination to politics he left the party in disgust at the high costs involved and the lack of opportunity.[49]

Except in public-image formation, Kaneko excelled in all types of human relations, having remarkable ability in evaluation of people, management, and the forging of useful contacts. He personally selected many very able employees, among whom the most noteworthy is perhaps Takahata Seiichi, who served the London office of Suzuki for many years and later became one of the most prominent businessmen in Japan, heading such world-famous companies as the prominent trading firm Nisshō and Harima Shipbuilding. Kaneko's skill in management is well exemplified by the continued encouragement of the two technicians Hata and Kumura at

Yonezawa.

Mori had great facility for making friends. He could even transform an initially hostile relationship into an amicable one. His stature was such that he could command the allegiance of such able technicians as Yokoyama and Nakamura. Mori, even in very early adulthood, during the course of his career in iodine manufacturing, gave considerable stress to public relations.[50] Mori's attitude was in marked contrast to Noguchi's almost entire neglect of his public image and Kaneko's blindness on this point up to the time of the Rice Riots in Kobe.

Mori and Kaneko appear to have been very emotionally stable. Mori was the managing director of a company which was bankrupted in the post-World War I period, and was later the director of a firm greatly troubled for several years by an unsalable surplus of electricity. Yet his optimism survived unscathed. Kaneko, too, retained his former buoyancy after the setback of the Rice Riots and the postwar slump. Noguchi was probably less stable, as he was easily upset by quarrels,[51] but his verve was little diminished by the setback of the late twenties.

Family background was of very different value to each of the three entrepreneurs. Kaneko's Tosa birth, lowly though it was, proved an invaluable asset, as Tosa politicans were powerful long after the Meiji Restoration. It was very probably through his fellow clansman, Itagaki Taisuke, that Kaneko became associated with Gotō Shimpei and the Bank of Taiwan. His vital connection with the Kenseikai in the twenties, too, owed much to his Tosa origin. Noguchi's gentry status must have been a considerable advantage in big business. While he possessed great

natural ability, much of Noguchi's early success was probably due to his family background, which must have facilitated entry to prestigious companies like Siemens. In the rather tightly stratified society of prewar Japan, his status would have been of great value, as it allowed him to make valuable contacts by socializing with the rich and powerful. His key relationship with the Mitsubishi Bank probably owed much to his family background. Mori's village upbringing was of little help in the formation of business contacts when he moved outside the Bōsō Peninsula. Mori had to succeed by virtue of his own strengths. The scion of a Kantō village bourgeois could neither enter the gatherings of the gentry, nor form contacts with highly-placed Tosa oligarchs.

THE ENTREPRENEURS OF THE RISING COMPANIES

FOOTNOTES

[1]Shiraishi Tomoji (ed.), Kaneko Naokichi Den (Tokyo: Kaneko: Yanagida Ryōo Shōtokukai, 1950), pp. 11, 37, 39.

[2]Kimura Takeshi, Shiroi Sekitan (Tokyo: Shikisha, 1953), p. 60.

[3]Kamoi Hisashi, Noguchi Jun: Ningen to Jigyō (Tokyo: Tōkōsha, 1943), p. 71; and Shibamura Yōgo, "Noguchi Jun to Kagaku Kōgyō: Nihon Kagaku Kōgyō o Kizuita Hitobito 20," Kagaku Keizai, December, 1969, p. 90.

[4]Shiraishi, op. cit., pp. 40-41.

[5]Kimura, op. cit., p. 100.

[6]Kamoi, op. cit., p. 117; and Shibamura, loc. cit.

[7]Shiraishi, op. cit., pp. 38-39.

[8]Kimura, op. cit., pp. 102-103, 123.

[9]Kamoi, op. cit., pp. 67-69.

[10]Ibid., pp. 72-73.

[11]Shiraishi, op. cit., p. 46.

[12]Shibamura Yōgo, "Mori Nobuteru to Denki Kagaku Kōgyō: Nihon Kagaku Kōgyō o Kizuita Hitobito 25," Kagaku Keizai, May, 1970, p. 93.

[13]Kamoi, op. cit., p. 118.

[14]Shiraishi, op. cit., p. 48.

[15]Kamoi, op. cit., p. 159.

[16]Kimura, op. cit., p. 122; and Suzuki Shigesaburō, Zaikai Jinbutsu Tokuhon (Vol. XII of Nihon Kontsuerun Zensho. Tokyo: Shunjūsha, 1937), p. 231.

[17]Shiraishi, op. cit., p. 95.

[18]Ibid., p. 112.

[19]Ibid., p. 211.

[20]Kamoi, op. cit., pp. 47-48.

[21]Fukumoto Kunio (ed.), Noguchi Jun wa Ikite Iru (Tokyo: Fuji International Consultants, 1964), p. 46.

[22]Suzuki, op. cit., p. 237.

[23]"Shōwa Denkō: Eikō to Ōmei no Hanseki," Bungei Shunjū, December 1971, p. 155.

[24]Kimura, op. cit., pp. 155-156.

[25]Suzuki, op. cit., p. 235.

[26]Shibamura Yōgo, "Sangyō Shihongata Kigyō no Seiritsu: Shōwa Hiryō no Sōsetsu to Hatten Jō," Kagaku Keizai, June, 1966, p. 57.

[27]Nihon Chisso Hiryō K.K. Bunshoka, Nihon Chisso Hiryō Jigyō Taikan (Osaka: Nihon Chisso Hiryō K.K., 1937), pp. 441-443.

[28]Kamoi, loc. cit.

[29]Ibid., p. 20.

[30]Ibid., p. 22.

[31]Ibid., p. 6.

[32]Shiraishi, op. cit., p. 20.

[33]Fukushima Katsuyuki (ed.), Ichiryū no Mugi (Vol. I of Teijin no Ayumi. Tokyo: Teijin K.K., 1968), p. 66.

[34]Ibid., and pp. 84-85.

[35]Katsura Yoshio, "Sōgō Shōsha to Kanren Kigyō: Suzuki Shōten," Keiei Shigaku, 8:40-41, August, 1973.

[36]Shiroyama Saburō, Nezumi (Tokyo: Bungei Shunjū, 1966), p. 35.

[37]Ibid., pp. 27, 38, 115-116 et seqq.

[38]Ibid., p. 76.

[39]Ibid., p. 47.

[40]George A. De Vos and Wagatsuma Hiroshi, Socialization for Achievement (Berkeley: University of California Press, 1973), pp. 144, 147 et seqq.

[41]Shiroyama, op. cit., p. 49.

[42]Shiraishi, op. cit., p. 46.

[43]Shibamura Yōgo, "Nakano Yūrei to Nihon Sōda: Nihon Kagaku Kōgyō o Kizuita Hitobito 24," Kagaku Keizai, April, 1970, p. 83.

[44]Shiroyama, op. cit., p. 150.

[45]Fukumoto, op. cit., p. 36.

[46]Kimura, op. cit., pp. 153-155.

[47]Kamoi, op. cit., p. 50.

[48]Fukushima, op. cit., p. 74.

[49]Suzuki, loc. cit.

[50]Kimura, op. cit., pp. 148-153.

[51]Fukushima, op. cit., p. 209.

C. THE CONFLICT

CHAPTER VIII

THE FIRST ATTACK ON THE SUZUKI SHŌTEN: 1918

I. BUSINESS AND THE OLIGARCHY

Business and Politics Prior to World War I

Throughout the Meiji Period, Japan had been governed by a group known as the oligarchy, whose power was not based on any constitutional provision. The Meiji Constitution of 1889 was their creation and imposed little real limitation on their power. The power of the oligarchy stemmed from two roots. Firstly and most important, the oligarchs as the prime movers or those closely connected to the prime movers in the Meiji Restoration had come to head powerful cliques which dominated the civil bureaucracy and the armed services. These cliques extended down to quite junior levels. Secondly, they had enormous prestige which derived from their leadership of the Meiji Restoration and the subsequent successful measures of economic and military modernization.

Up to the very last years of Meiji, there had been no serious challenge to their power. To be sure, under the constitution of 1889, a partially elected Diet had been established which did exert a degree of control over finance and opposed some of the measures of the oligarchy. Essentially, however, the lines of political conflict ran vertically and not horizontally. Differences expressed themselves in conflict between two cliques of the oligarchy, each of which worked against the other in loose concert with an associated party in the Diet.

Even in the late Meiji Period, business had relatively little influence on government policy formation. No real industrial base developed until the Russo-Japanese War, and the concentration of economic power into the hands of the zaibatsu was not nearly as marked, even at the very end of the Meiji, as it was to become in the 1920's. The political power of business was thus rather weak, though slowly increasing. This is not to say that business was without connection to the oligarchy or the Diet. Far from it. Yamagata Aritomo's protégé, Katsura Tarō, for example, drew funds from both Mitsui Bussan and the Suzuki Shōten in the late Meiji Period.[1] Businessmen, who needed favour or protection, frequently bribed Dietmen. The acquisition of water rights for the development of hydro-electric power schemes, for example, required considerable political influence. Even once acquired, without political protection, these water rights could well be alienated. Business, up to the end of Meiji and beyond, was thus a purchaser of political favours, rather than a wielder of political power.

With the First Movement for Constitutional Government immediately prior to World War I came evidence of a shift in the relations between business and the oligarchy. The movement was an attempt to assert the sovereignty of the Diet. The principal pressure was applied by the Seiyūkai, a political party in the Diet, led by Hara Kei, who strongly opposed the oligarchy. The party was principally funded by Mitsui. Underpinning the First Movement for Constitutional Government were two factors: the decline of oligarchical power and the slow rise of business power.

The decline of oligarchical power was also a product of two factors: the formation of a new force within the civil bureaucracy and the retreat of the Meiji Restoration beyond the memory of most Japanese. The Meiji government, in the course of its famous program of national strengthening and modernization, had created a Frankenstein, which was to play a very important part in the demise of oligarchical power. The Meiji education system had produced a considerable number of career bureaucrats and would-be career bureaucrats, many of whom were unconnected with and therefore hostile to the oligarchical cliques. This aspiring and largely frustrated new element was progressively mobilized by the Seiyūkai under Hara Kei in the period following the Russo-Japanese War.[2]

In 1913, the industrial sector, while still small, was firmly based, and the two Great Zaibatsu, Mitsui and Mitsubishi, already had numerous well-established subsidiaries.[3] For business, the obvious route to strong political influence, if not domination, lay through financial control of a "politically sovereign" Diet. There can be little doubt that, behind Seiyūkai political activity, lay zaibatsu and especially Great Zaibatsu money power. Hara Kei was well noted for his bottomless chest of campaign funds.[4]

The First Movement for Constitutional Government was short-lived but violent. The Seiyūkai and its allies obtained a majority in a motion of non-confidence in the Katsura Cabinet in February 1913. The movement set off a series of large-scale political demonstrations and riots, and the Katsura Cabinet, fearing revolt, resigned. The movement was a partial victory for the Seiyūkai, as the succeeding cabinet,

although still controlled by the oligarchy, included a much greater number of Seiyūkai members than ever before, and all the principal ministers became at least nominally party members.[5]

Business, Politics and World War I

World War I caused a transformation of the Japanese economy, which in turn completely altered the political power relations of business and the oligarchy. As we have seen, the power of the oligarchy was being eroded by the passage of time and the assault of the Seiyukai, but World War I caused a great acceleration of this process, as business power was enormously increased by the entirely unprecedented war boom. The zaibatsu, and in particular the Great Zaibatsu, were far larger and incomparably more powerful in 1919 than they had been in 1914.

By 1917, even those political elements which had previously supported the oligarchy had come fully into confrontation with it. The prominent Dōshikai politician Katō Kōmei first came into conflict with the oligarchy over his aggressive presentation of the Twenty-One Demands to China in 1915 in association with Ōkuma Shigenobu. Yamagata, the leading oligarch, completely alienated Katō in October 1916 when he appointed General Terauchi Masatake to head a transcendental cabinet, instead of nominating a party cabinet with Katō as Prime Minister, as contemporary opinion had expected. The day after Terauchi's appointment, Katō formed a new political party, the Kenseikai, and swore to drive Terauchi from office. At the time, the Seiyūkai, although fundamentally still opposed to the oligarchy, due to a political compromise, supported the Terauchi Cabinet.[6] In early 1918, Terauchi seemed strongly entrenched.

It might seem from the above outline that the power of the oligarchs was at high flood, rather than strong ebb, but this was far from the case. Following the unprecedented defiance of Katō and Ōkuma in the presentation of the Twenty-One Demands, the oligarchy, while continuing to appoint transcendental cabinets, compromised increasingly with the parties of the Diet.[7] The Rice Riots of the summer of 1918 were to sharply crystallize political changes which had been slowly jelling for four years.

II. SUZUKI IN POLITICS AND BUSINESS

Suzuki and the Oligarchy

While during World War I the weight of the rising power of business was being thrown behind the political parties, a few enterprises remained closely related to the oligarchy. By far the most notable of these firms was the Suzuki Shōten.

We have previously made passing reference to Suzuki's political connections, but now these must be discussed in detail. As we have noted, there was a close relationship between the oligarch, Gotō Shimpei, and Kaneko Naokichi from the late 1890's, and it must have been through this friendship that Kaneko obtained the lucrative rights to the camphor trade in Taiwan and the close and long-maintained backing of the Bank of Taiwan. Only through such a friendship could the then small and obscure Kobe trading company have obtained the backing of the august semi-official Bank of Taiwan. It is certain that, in return for

such favours, Kaneko funded Gotō himself and the dominant Yamagata clique of the oligarchy of which Gotō was a prominent member.

Though the close relation of Gotō and Kaneko was public knowledge, there is of course no direct evidence of funding. There are a few scraps of information which do obliquely, to a degree, corroborate the idea that Kaneko was a financial backer of the oligarch. The first piece of evidence is a very eloquent silence. The standard work on Gotō, a massive four-volume biography,[8] makes no mention whatsoever of the Suzuki Shōten or Kaneko Naokichi. This is very surprising in view of the considerable role played by the Kobe trading company in the development of the camphor trade of Taiwan, its undoubted link to the Bank of Taiwan, and the well-known friendship of Gotō and Kaneko. This very silence strongly suggests something illicit in the relationship. A short biography, published in haste only three months after the death of the oligarch[9] does, however, have two references to the supply of political funds in return for favours. The first describes a joking remark by Gotō to some newspapermen in 1908 that he was to be a big shareholder in a sugar refinery planned by Suzuki at Gotō's request at Keelung in Taiwan.[10] The second incident occurred in 1909, when the oligarch again jocularly remarked to some prominent Kansai financiers that "I have made some money again." According to the source, the contemporary press interpreted this to mean that Gotō had profited by permitting Japan Sugar Refining to purchase Dairi Sugar Refining from Suzuki.[11] The author, of course, denied absolutely that there was any vestige of truth in these hints of bribery.

Suzuki was linked to the oligarchy in another way, through marriage, as Nagasaki Eizō, the head of the firm's Tokyo branch, was married to a daughter of Katsura Tarō. Nagasaki very probably channelled funds to Katsura.[12]

Suzuki and the Two Great Zaibatsu

There is considerable circumstantial as well as some direct evidence of great antagonism between Mitsui and the Kobe trading company.

In their first contact in Taiwan during the late 1890's, a strong antipathy developed between the two companies over competition for the camphor trade.[13]

In 1909 a serious dispute arose between Mitsui and Kaneko over the payment of creditors of the then insolvent Japan Sugar Refining. Kaneko, who was himself a major creditor, refused the offer of the presidency of the firm. He opposed a group of large creditors led by Mitsui, which demanded that the insolvent firm be bankrupted so that the group could seize the bonds and leave a smaller creditor with no compensation. Kaneko negotiated a postponement of the repayment of all creditors for two years, and this saved Japan Sugar and the funds of the smaller creditor.

In the very late Meiji Period, the Mitsui Bank, which with other financial institutions had extended considerable credit to the then ailing Suzuki subsidiary Kobe Steel, attempted to use its financial leverage to sell the subsidiary over Suzuki's head to Mitsubishi. Only Mitsubishi's disinterest kept Kobe Steel in the Suzuki group.[15]

As we have noted, while the older zaibatsu grew fairly rapidly during World War I, Suzuki grew at an almost explosive rate. These

differences in the rate of growth cannot but have alarmed the older zaibatsu and especially Mitsui. Mitsui differed from the other major zaibatsu in having a very strong trading arm, which was a substantial source of revenue. While Suzuki's industrial subsidiaries proliferated during World War I, it was the growth of Suzuki's trade and especially foreign trade which was most striking. Compared to Mitsui Bussan, the total trade of Suzuki in 1908 had been tiny, but by 1917 the Kobe company had replaced Mitsui as Japan's number one trading company.

Nor was it simply the rapid rate of growth of Suzuki's trade which was alarming. Kaneko, utilizing data supplied by his superb information net in Europe and America, had demonstrated not merely great but positively uncanny ability in the interpretation of commercial and political intelligence during World War I. Though it is true that he had considerable experience in dealing with Westerners in Japan, Kaneko never set foot in the Occident and yet, as we have noted, he was able to predict demand and price movements in Europe with startling accuracy. This was a man to be feared.

In 1918 it seemed to many in Japan that World War I might well continue for another two or three years and that Suzuki would greatly narrow the gap between it and the greatest of the zaibatsu. The zaibatsu leaders, as we have seen, guarded their deliberations and their plans closely. Suzuki, however, was somewhat more open. While there appears to be no direct information on Mitsui's attitude toward the Kobe trader, we do have such evidence of Kaneko's attitude toward the Great Zaibatsu. A letter from Kaneko to Takahata Seiichi of the London office, dated

November 1, 1917, depicts the existing confrontation between Suzuki and the two Great Zaibatsu in very dramatic terms. Kaneko stated that, after World War I, Suzuki would either rule the commercial world jointly with Mitsui and Mitsubishi, or would be oppressed by them, and he urged that the staff should exert themselves to the limit to take advantage of the opportunity presented by the war. He proposed to drive himself to the utmost, even if it took five to ten years off his life. Kaneko drew a striking analogy of the current struggle between Suzuki and the Great Zaibatsu with the naval war between Japan and Russia in 1905, and quoted Admiral Tōgō's famous signal before the critical engagement with the Russian fleet at Tsushima--"The fate of the Empire depends on this one stroke."[16]

Events and incidents still well into the future in 1918 confirm the antagonism between the two companies. In 1927, as we shall see, it is highly probable that Mitsui launched a carefully calculated and highly successful attack on Suzuki through the Bank of Taiwan Crisis (see page). In 1928 when Mitsui, as part of the spoils of victory, acquired the former Suzuki subsidiary Number One Nitrogen, approximately half of the staff, including a number of leading technicians, left to enter Sumitomo's chemical division rather than work for the old enemy Mitsui.[17]

There is no reason to believe that there had been any long-standing hostility between Suzuki and Mitsubishi in 1918. There was relatively little overlap in the activities of the two companies, as the trade-centred Suzuki, while highly diversified in industry, did not

even begin to rival Mitsubishi's massive strength in the engineering sector. There had been, in fact, a degree of cooperation between Mitsubishi and Suzuki, as for example between 1906 and 1910, when the two firms collaborated in an unsuccessful joint venture to develop celluloid and rayon plants.[18]

Neither is there any significant evidence of conflict after 1918. In the 1920's both companies were financial supporters of the same political party, the Kenseikai, and Mitsubishi appears to have played no significant part in the financial and political campaign which bankrupted Suzuki in 1927.

While by the end of World War I Mitsubishi must have feared the rapid growth of Suzuki to a degree, there was not the antipathy which characterized the Mitsui-Suzuki relation. In part, this antipathy seems to have been a revulsion of opposites. Mitsui was the principal oppressor of small business, while Kaneko, on the whole, was a champion of the underdog. In internal organization Mitsui was very hierarchical with glaring contrasts in social prestige and living standards. In Suzuki, while of course there were differences between the top and bottom, there was, as we have seen, a degree of material egalitarianism and an absence of deep social distinctions within the company.

III. THE ATTACK ON SUZUKI

By the early summer of 1918, a direct final assault on the oligarchy by the Great Zaibatsu and their allies appeared imminent, and it seemed highly probable that Suzuki too, as a financial pillar of oligarchical power and a commercial threat, would come under attack.

The Ōsaka Asahi

While the role of the Great Zaibatsu in the attack on Suzuki must be considered in terms of evidence which though considerable is largely circumstantial, the part of the Ōsaka Asahi Shimbun is obvious and directly verifiable.

As we have seen, in October 1916 the transcendental cabinet of General Terauchi Masatake came to power. The appointment of this cabinet by the oligarchy in complete defiance of the expectations of the political parties, the zaibatsu and their allies aroused not merely the bitter opposition of Katō Kōmei and the newly formed Kenseikai, but of much of the whole spectrum of political forces. Genuine liberals and socialists were particularly enraged.

During World War I the number of socialists on the editorial staff of the Ōsaka Asahi gradually increased and, in 1918, shortly before the outbreak of the Rice Riots, the socialist faction gained complete ascendancy. The newspaper had consistently opposed the policies of the oligarchy since 1913, when it supported the First Movement for Constitutional Government.[19] In 1916 it opposed the Nishihara Loans and, in the summer of 1918, it was to oppose both the lack of a firm government

rice policy and the despatch of the Siberian Expedition.

In April 1918, due to the sickness of Prime Minister Terauchi, Gotō Shimpei, the former Home Minister, became Acting Prime Minister. There was no figure more hated by the Japanese press, as Gotō was the oligarchy's expert on the silencing and suppression of anti-government newspapers. He was a long-standing enemy of the Ōsaka Asahi. Friction between the oligarch and the paper had started with the election campaigns of 1915, when the paper had severely criticised Gotō as Home Minister for flagrant intervention in the election of that year. Largely on account of this criticism, Gotō's close and trusted henchman, who had headed the police in Shiga Prefecture, was forced to resign. Gotō never forgave the Ōsaka Asahi for this. From that time on, the oligarch relied on the use of forceful methods to curb editorial attacks on government policy in the Ōsaka Asahi. Gotō's arsenal included such weapons as direct suppression of issues and the services of a gang of right-wing toughs.[20]

During 1918 tension between Goto and the Ōsaka Asahi was further heightened by two factors.

In the early summer of 1918, the strongly socialist faction headed by Torii Sugawa gained complete ascendancy at the Ōsaka Asahi.[21] According to the recent testimony of the social editor in the summer of 1918, Hasegawa Nyozekan, who later became a noted philosopher and writer, most members of the editorial staff, while endowed with a strong sense of justic, lacked balance in social and political matters. The editorial columns "Opinion," "Judgement Stand" and "The Mercury Vapour Lamp"

frequently carried articles slanted against the government. Torii, as editor-in-chief, often took a relatively balanced article written by a subordinate and gave it the notorious Torii slant.[22]

The second factor was that the staff of the Ōsaka Asahi believed that Kaneko had supplied funding for a 300-page right-wing publication of July 1918 called The Authority of the Debating World--A New Era, which was allegedly backed by Gotō. This work attacked the Ōsaka Asahi at length as "the public enemy of morality and the epitome of dangerous thought."[23] We have strong evidence that Suzuki did not in fact back this publication. Nishikawa Bunzō, a very senior employee of Suzuki and a personal friend of Kaneko, writing after the anti-Suzuki riot of August to Takahata of the London office, noted that the supposed connection between the publication and Suzuki was non-existent.[24]

What was the basic attitude of the editorial staff of the Ōsaka Asahi to Suzuki? According to Hasegawa in a recent interview, the attack on the Terauchi Cabinet and its supporters was an attack on policy and not on persons. Hasegawa went so far as to say that, apart from its links with the oligarchy, the Suzuki Shōten "had nothing else wrong with it" and that "he had heard good of the character of Kaneko."[25] The accuracy of Hasegawa's observations may be doubted. At the time of the interview, he was in his eighties and recalling events which had occurred nearly half a century before. He had difficulty, for example, in recalling the meaning of the term "Seishō", which was in common use up to the late twenties. It seems doubtful that the editorial staff of the Ōsaka Asahi were as objective as the latter-day Hasegawa would

have us believe. The Asahi attacked Suzuki as a vulnerable associate of the hated Gotō and not simply as an ideological enemy.

One further comment remains to be made regarding the Ōsaka Asahi--the ownership of the paper. The Murayama family, the contemporary owners, who had been associated with the paper since its founding in 1879, were linked to Mitsui by marriage.[26]

The Campaign of the Ōsaka Asahi: Early Phase

The opening shot of the campaign was fired early. In 1916 the newspaper attacked Suzuki in the strongest terms, accusing the company of shipping rice to the enemy country Germany. The Ōsaka Asahi claimed that Suzuki, instead of openly using the major ports of Kobe and Yokohama, was secretly shipping rice at the relatively minor port of Moji. Suzuki was thus held up as a traitor. The newspaper's information was incorrect. A ship was being loaded at Moji by Suzuki, but it was Danish not German, and its destination was San Francisco not Hamburg. The Ōsaka Asahi retracted its story, but nevertheless for most readers the Suzuki image was already beginning to tarnish.[27] In view of the later reporting of the paper, it is most unlikely that this incident was anything other than a deliberate attempt to discredit Suzuki.

The full barrage did not come until nearly two years later, however. In February 1918, Suzuki forced a low price on a group of wheat flour dealers, who in resentment mounted a lengthy press campaign against Suzuki in the Kansai area, and labelled the company as a profiteer. Suzuki's image suffered badly from this incident.[28]

In the edition of June 12, 1918, the Ōsaka Asahi attacked Gotō, then the Acting Prime Minister, over his statement that the government employees who staffed the Kyushu Railway Control Bureau should "take the attitude of merchants." This was really trivial and, in context, it clearly meant that railway employees should be industrious and dedicated to their work, but the paper lifted the phrase from context and twisted its meaning so that Gotō seemed to be calling for a money-centred attitude.[29]

In the edition of June 26th, the Ōsaka Asahi identified the Suzuki Shōten as the manipulator of a group of sellers which caused the price of rice to fall, with the timely onset of the plum rains. While at first this might seem to be a move to improve the Suzuki image, in the context of the campaign it was nothing of the kind. The object of the article was to establish Suzuki as a powerful hidden manipulator of the rice market. As rice prices over the longer term were rising with unprecedented speed, it was in fact a blow at Suzuki.[30]

Before we can describe the further development of the Ōsaka Asahi campaign, however, we must look at rice cornering in Kobe in some detail.

Rice Cornering in Kobe

Of much that is highly uncertain concerning the causes of the Rice Riots in Kobe, it is beyond doubt that Suzuki was innocent of rice cornering. This is borne out by a number of lines of evidence.

Those then connected with the local trade deny Suzuki's guilt. A former young official of the Kobe Rice Exchange, for example, who came

to know the local rice market intimately, stated that Suzuki had not been involved in the rice futures trade in Japan during 1918.[31] Suzuki was not active in rice sales on the internal market until a few days prior to the Rice Riots, when the firm began to sell rice on behalf of the government.

In 1918, far from profiteering in rice, Suzuki was acting to depress the price. Under the Ōkuma Cabinet of 1915-1916, Suzuki was used by the government as an agent to stabilize the rice price in Japan. At that time, this had meant that Suzuki conducted a vigorous rice export trade to eliminate the glut of rice and thus raise the price.[32] By April 1918, however, a serious under-supply of rice appeared to have developed, with rapidly rising prices, and in that month Gotō requested Kaneko to import heavily. As usual, profits were to be restricted and Suzuki was to receive only a very nominal handling charge. We have documentary evidence that Suzuki's rice trading operations were, in fact, conducted on the lines which Gotō had planned and were very far indeed from profiteering. In a letter to Takahata of the London office dated May 5, 1918, Nishikawa, an executive at the main Kobe office, sourly noted that, in response to Gotō's request, a mountain of rice was building up in Suzuki's warehouses to serve as a store for use in case prices rose too high. Nishikawa was opposed to the whole scheme, fearing that a sudden reversal in the price trend could well lead Suzuki into a loss position on the internal market, without the option of re-exporting the rice to profitable foreign markets, as a government order of May 1918 specifically

prohibited the export of rice.[33]

A letter from Kaneko himself supplies further evidence. In a circular to all company branches handling rice, he ordered that the government-designated price for the imported rice be strictly observed when it was sold.[34]

Kaneko was reluctant to handle the business, as it required the diversion of scarce shipping and the forgoing of much more profitable trade.[35] At first sight it seems surprising that Suzuki, a firm government supporter, was not given a much more lucrative contract. The explanation is probably that Gotō wished to avoid any suggestion of profiteering, since soaring rice prices were a highly explosive issue, as the Rice Riots were very soon to demonstrate. Gotō failed to make sure, however, that Suzuki's dealings on the rice market were not interpreted as rice cornering by the public.

While Suzuki was innocent, there is some evidence to indicate that Mitsui was not. At a meeting to commemorate the forty-sixth anniversary of the Rice Riots in Kobe, a previous head of the local committee of the Socialist Party said, in the course of a speech, that Mitsui had been secretly exporting rice in the period of shortage preceding the Rice Riots. According to the speaker, one of his friends had supervised a squad of guards equipped with pistols, who protected the loading operation.[36] Such protection was probably necessary, not only to stop the depredations of the poorer classes, but also to check theft by agents of rice speculators. Mitsui, the speaker went on to say, maintained a pretence that the rice was in the process of import and not of

export. Given a secluded wharf and a warehouse hidden from public scrutiny, it was entirely possible that such a pretence could be maintained for a time.

Confirmation of Mitsui's guilt is probably to be found in the combine's consistent use of the dummy company Masuda in its grain handling operations.[37] Suzuki, in contrast, always used its own facilities.

What appears to have been Mitsui's anti-social and illegal export of rice calls for comment. The Ōsaka Asahi, as a Mitsui-associated newspaper, of course, reported nothing whatsoever about Mitsui's rice trading. This illicit trading was probably an additional motive for the attack on Suzuki in the columns of the Ōsaka Asahi. Mitsui, both before and during the Rice Riots in Kobe, might well have sought to deflect attention from its own activities by identifying the Kobe trader as a rice trade profiteer.

Why was Mitsui exporting rice in the summer of 1918 at a time when Suzuki was importing cheap foreign rice? Was it that there were countries where the rice price was even higher than in Japan, or that certain special varieties grown only in Japan were in demand abroad? Or was it that the rice shortage of 1918 was, in part at least, artificial and created by rice exports deliberately designed by unscrupulous speculators to produce a shortage and increase the price?

The Campaign of the Osaka Asahi: Late Phase

The Ōsaka Asahi continued to attack the Suzuki Shōten until the government suppressed all reporting related in any way to the Rice Riots

on the evening of August 14th.

In the issue of July 23rd, the paper printed the first of a series of articles indicting Suzuki for cornering rice behind a front of dummy companies.[38] These accusations, which continued up to the time of the Rice Riots in Kobe, were to play a major part in focussing public anger over skyrocketing rice prices and general inflation against the company. In fact, there was no substance to the newspaper's charges.

On August 2nd the Ōsaka Asahi, under a banner headline reading "Steady Sale of Korean Rice. Two thousand bushels of rice to arrive in Osaka after the 5th," attacked Suzuki for holding back rice which had previously arrived at the company's warehouses from the wholesale market, and accused the firm of avoiding the public rice market.[39]

A further article on August 11th attacked the Suzuki Shōten, which had started retailing rice on the 9th, as rice sales on the 11th had not proceeded at one outlet, though this was simply due to an error on the part of the company.[40]

IV. THE RICE RIOTS IN KOBE

Following the outbreak of the riots at Toyama on August 5th, news of successive disturbances in other parts of Japan continued to agitate the people of Kobe. Tension in the city rose steadily and, by August 10th, it had reached a fever pitch.

On the 10th, Nishikawa, who had frequently pressed Kaneko to make a contribution to public welfare, again requested a donation.

Kaneko, however, remained adamant, protesting as usual that this type of aid was highly ostentatious.[41]

On the 11th, tension rose to even greater heights and, on that day, at an emergency meeting, Governor Kiyono of Hyōgō Prefecture stated that agitators were inciting the mob to violence and appealed for immediate donations to pacify the city. Kaneko, now sufficiently alarmed to overcome his scruples, at last contributed and offered 100,000 yen, which was the largest donation made at the meeting.[42]

Early in the morning of the 12th came the first outbreak of violence, when Mitsubishi Shipyard boilermakers rioted over wages.[43] That evening Kaneko took the train to Tokyo. Shiroyama states that he left for talks with the U.S. Ambassador Rowland Morris on the Shipbuilding Iron Agreement, but it is doubtful whether this was the real reason. Firstly, the coincidence in time of Kaneko's departure and the outbreak of the riots is probably too close to be fortuitous. Secondly, while Kaneko had certainly played the key role in the negotiations to restore the flow of U.S. iron exports to the Japanese shipbuilding industry, it is probable that agreement had been reached prior to the 12th.[44] Kaneko's departure, however, must be considered as an act of prudence and not of cowardice, as on return to Kobe he displayed complete equanimity in the face of danger.

On the 12th the campaign of the Ōsaka Asahi continued with attacks on the Terauchi Cabinet and Suzuki. A sarcastically-entitled article "The Prime Minister Summering" bitterly criticised the failure of the government policy to restrain price rises, while a further

article indicted Suzuki for rice profiteering.[45]

The agitators in Kobe seem to have been mostly connected to either the Seiyūkai or the far left.[46] By the 11th, agitators were haranguing large mobs, with attacks on the Terauchi Cabinet, Gotō Shimpei and Suzuki. Katō Kōmei, the President of the Kenseikai, then violently opposed to the Terauchi Cabinet, also came under fire. As the Kenseikai and Seiyūkai were then acting in concert against the oligarchy, this requires explanation. It may have been that Seiyūkai agitators were seeking to turn the attention of the mobs from Mitsui towards Mitsubishi. Katō Kōmei, as son-in-law of Iwasaki Yatarō, was closely linked with Mitsubishi.

At dusk on the 12th, the mobs rioted for the first time. Suzuki's Head Office, a wooden building, was burnt down. The rice store of Kobe Steel, a Suzuki subsidiary, was plundered and burnt. A mob marched towards the Suzuki villa, but turned back before reaching its objective, probably after receiving news that Yone and other members of the Suzuki family had fled to Hikoshima near Shimonoseki in the far west of Honshu.[47] Late that night, the buildings of another Suzuki company, Japan Camphor, were fired and completely destroyed. Kaneko, on the night train to Tokyo, received a terse telegram at Shizuoka—"Main office now under attack." However, he proceeded to Tokyo and completed his business.[48]

Mitsui Bussan's office, too, was attacked, but the assault appears to have been only half-hearted. The attempt to fire the building failed and no follow-up attacks were made.[49] No move appears to have been made

against any other Mitsui installation in Kobe.

The Head Office of the Yuasa Shōten, another trading company, which with Suzuki and Mitsui was a government-designated rice dealer, also suffered a weak attack with negligible damage.

On the following day, August 13th, in response to the request of the Governor of Hyōgō, the Himeji Division arrived in Kobe and took up guard duty. On the night of that day, a mob of 30,000 moved to attack the remaining Suzuki installations and also to renew the assault on the Head Office of the Yuasa Shōten. The attack on Mitsui's installations was not renewed. On this night, the Himeji Division halted and dispersed the mobs, inflicting casualties on the rioters. Though emotion continued to run high in Kobe and there was further mob violence, this was the turning point in the riots.[50]

On his return from Tokyo, Kaneko seems to have been little perturbed, though he was in considerable danger. The streets still echoed to cries for attacks on Suzuki leaders and posters had appeared which offered 100,000 yen for the head of Kaneko.[51]

While none of the staff had been killed, or seem to have suffered serious injury in the Rice Riots, the company had been hard-hit. The principal blow was to the firm's shipbuilding arm. In mid 1918, Kaneko had correctly forecast that World War I was drawing to a close and had shaped company planning accordingly. He had decided that the best policy was to build as many ships as possible in the few remaining months and then withdraw entirely from the shipbuilding industry before the market for ships collapsed. Kaneko's plans were thrown into disarray

by the attack. Due to the burning of the company's Head Office, many key documents and plans were lost and, by the time they had been replaced, the wartime boom was drawing to a close. There was also a general dislocation of the firm's plans. For example, as we have noted, the equipment which Kumura had laboured so hard to obtain from National Rayon was never purchased owing to the disorganization consequent on the Rice Riots (see page 202).

Kobe had been tense since the start of the Rice Riots in Toyama on August 5th and very tense for the three days preceding the attack. Why did Kaneko, master of political interpretation that he was, fail to safeguard the firm's interests from this all-too-obvious danger?

One explanation may lie in a tragedy which occurred in his personal life at this time. His mother, then ninety-two years of age and living in Shikoku, became critically ill and he left to attend her on July 27th. She died and was buried on August 5th. Kaneko did not return to Kobe until August 10th.[52] He was then, at least to some degree, out of touch with the rapidly developing crisis in Kobe, and it may have taken him some time to fully appreciate the danger of the situation. On return to the city, too, his mind may have been numb from the shock of his mother's death, and it is possible that he drifted about in a daze for several days afterwards. Although she had been very old, Kaneko was exceptionally close to her and the actual death, though long anticipated, must have been a great blow. His depression over the later death of his close associate Nishikawa Bunzō shows that he could be greatly upset by the death of someone close to him.

Another explanation is that Kaneko's lack of precaution stemmed from an excessive sense of security. In contrast to the zaibatsu, he showed strikingly little concern about the firm's image. In spite of repeated suggestions for some time prior to the Rice Riots by Nishikawa Bunzō, Kaneko refused almost to the last moment to donate to charity. He also appears to have shown little interest in the ominous campaign of the Ōsaka Asahi against Suzuki. Prior to the Rice Riots, Kaneko did not conduct any propaganda campaign, either through the press or by other means, to improve Suzuki's image. Nor does he ever seem to have seriously considered doing so.

Why did Kaneko feel so secure? It seems that he failed to analyze the domestic situation in the summer of 1918 correctly. This is strange. Through Gotō Shimpei, his sources of political information should have been excellent. In analytical ability, Kaneko had few, if any, equals in Japan. How can he have been so mistaken? One possible explanation is that the oligarchy had lasted so long that those associated with it had come to regard it as being as much a permanent feature of the Japanese political landscape as Mount Fuji was of the physical landscape. For this reason, Kaneko could have underestimated the erosion of the power of the oligarchy during World War I and believed that it could still afford him protection in Kobe, even at the time of the Rice Riots. It is possible that he believed the agitators, when it came to the critical point, would not dare to move the mobs against such an august pillar of oligarchical authority as Suzuki.

It is, of course, possible that Kaneko's extraordinary misinterpretation was a product of both the factors which we have noted above or yet of other factors.

V. THE ROLE OF MITSUI

The Selective Attack on Suzuki

In the Rice Riots in Kobe, Suzuki was singled out for attack by a predetermined plan. All of the obvious Suzuki targets with one possible exception, Oriental Match, suffered determined and mostly successful attacks on the night of the 12th[53] (Table XXXII), and further attacks were made on the night of the 13th. In one account of the attack on Suzuki's Head Office on the 12th, a well-armed group cut the fire hoses and, according to another, the office was fired by a member of the River Amur Society.[54] Only Kaneko Naokichi among the business leaders of Kobe, seems to have been an object of attack as a person. Though it is doubtful whether the price for Kaneko's head would ever have been paid, the enormous sum of 100,000 yen suggests extreme animosity. This figure was as great as the paid-up capital of the smallest Suzuki subsidiaries and equivalent to approximately 35,000 American dollars.

Other firms suffered relatively slight damage.[55] There appears to have been only one half-hearted attack on the Head Office of Mitsui Bussan in Kobe, but none on the Mitsui Bank or other Mitsui installations in the city. Mitsubishi, however, did suffer to a degree from the riot of the shipyard workers.

TABLE XXXII

SUZUKI AND THE RICE RIOTS IN KOBE 1918

Installations attacked	Damage
Suzuki Head Office	Burnt down
Japan Camphor	Plant burnt down
Kobe Steel	Rice store burnt down
Suzuki Villa	Mob moved against it, but turned back
Companies with Head Office in Kobe whose installations were not attacked	**Probable reason for non-attack**
Sixty-fifth Bank	General public did not associate bank with Suzuki
Japan Metals	Plant at Hikoshima
Yaeyama Industries	Very small company (paid-up capital 112,500 yen)
Oriental Match	?
Imperial Steamships	Steamship company and, therefore, few employees in Kobe
Imperial Match	Very small company (paid-up capital 200,000 yen) and very recently founded
Imperial Rayon	Factory in Hiroshima

The very fact that it was only in Kobe that the riots were planned indicates that Suzuki was the victim of a premeditated assault. The difference between Kobe and the rest of the country was noted by the contemporary press. According to one newspaper account, the attacks on the night of the 12th in Kobe were instigated by a group of agitators, who pulled out when their work had been completed.[56] One large Tokyo newspaper, reviewing the riots, stated that only in the case of Kobe was there evidence of planned action.[57] Post-World War II studies on the Rice Riots[58] have fully corroborated the contemporary view.

Why did Suzuki suffer so heavily? We have indicated that it was certainly not just due to Suzuki's undoubted prominence in the Kobe area. It was not simply that, among a number of generally-hated, newly-rich, Suzuki was the most famous and most immediate representative. As we have already indicated, other factors were involved.

The Case Against Mitsui

It is probable that Mitsui played a major part in the attack on the Suzuki Shōten in the Rice Riots of 1918.

Mitsui had a strong motive. The rivalry between the two companies was of long-standing and had become particularly intense during the war years. As we have seen, the rivalry comprised three distinct elements. There was the inevitable friction between trading companies dealing in the same products within the same geographical areas. There was the sense of enmity between "instinctive" opposites. Suzuki was rather egalitarian in philosophy, while Mitsui was extremely hierarchical.

Then, too, the rivalry had been greatly exacerbated by the war boom, which Suzuki had used to topple Mitsui from its long-held hegemony over the Japanese trading world.

The Great Zaibatsu not only had the motive, but also had the means to strike at Suzuki. While the Ōsaka Asahi had attacked the oligarchy since 1913, the ascendancy of the extremist Torii Sugawa faction came only immediately prior to the campaign against Suzuki in the summer of 1918.[59] It seems highly probable that the sudden rise of Torii and his associates at this juncture was at the instigation of Mitsui. Torii, Hasegawa and their colleagues were, without doubt, true socialists, committed to the overthrow of the existing social order and its replacement by a new egalitarian form of society. Mitsui's objective was the overthrow of the autocratic, though sometimes paternally benevolent, oligarchy, its replacement by the predatory reign of the Great Zaibatsu, and the infliction of considerable damage on a dangerous rival in trade and industry. Torii and associates, in their endeavour to hasten the approach of utopia would, according to this hypothesis, have simply served the interests of the Great Zaibatsu.

Nishikawa Bunzō clearly laid the blame for the instigation of the attack on Suzuki during the Rice Riots on Seiyūkai agitators. This testimony, while by no means amounting to proof of Seiyūkai involvement, does afford further support to the idea of Mitsui's complicity, as the combine was the principal backer of the party. The involvement of the Seiyūkai against the oligarchy at this time calls for comment. The Seiyūkai, which had long and violently opposed the oligarchy, was at

this time allied with it in Diet politics. Yet, the attack on Suzuki was clearly an attack on the oligarchy.

While the Seiyūkai was fundamentally opposed to the oligarchy in the struggle for the control of Japan, the truce in the Diet was maintained throughout the period of the Rice Riots. Yet, it seems unlikely that the party would have entirely ignored the great opportunity presented by the Rice Riots to embarrass the Terauchi Cabinet and the oligarchy as a whole. While the alliance of the Seiyūkai was not broken in Diet politics, it may well have been that the party was active in public agitation throughout Japan. This agitation would have had to have been on a much smaller scale and thus less obvious than in Kobe, or otherwise the alliance would have been broken.

It is probable that Kobe was an exception, because here the principal backer of the Seiyūkai, Mitsui, had a special stake. Through the turning of the rioters against Suzuki, Mitsui could hope to gain two objectives. Firstly, and of lesser importance, as some news of Mitsui's rice cornering had probably leaked out, it is probable that Mitsui hoped to deflect the mobs from its own installations to those of Suzuki. Secondly, and much more important, it is highly probable that Mitsui, knowing of Suzuki's false feelings of security, hoped that mob action would destroy a number of Suzuki installations and especially the Head Office with its vital information and plans. Possibly, too, Mitsui hoped that Kaneko and other Suzuki executives would be killed or seriously injured by the mobs directed by its political allies. Thus it was with political weapons used in fortuitously occurring circumstances

that Mitsui struck Suzuki in 1918. This was a pattern that was to reoccur.

THE FIRST ATTACK ON THE SUZUKI SHŌTEN: 1918

FOOTNOTES

[1]Imai Seiichi (ed.), Taishō Demokurashii (Vol. XXIII of Nihon no Rekishi. Tokyo: Chuokōronsha, 1966), p. 21.

[2]Najita Tetsuo, Hara Kei in the Politics of Compromise 1905-1915 (Cambridge, Mass.: Harvard University Press, 1967), pp. 33-35.

[3]Noda Nobuo, "Nihon Zaibatsu Shi e no Kiyo," Keiei Shigaku, 5:104, 1971.

[4]Najita, op. cit., note 24, p. 266; and John G. Roberts, Mitsui: Three Centuries of Japanese Business (New York: Weatherhill, 1973), p. 210.

[5]Imai, op. cit., pp. 27-34.

[6]Hugh Borton, Japan's Modern Century (New York: Ronald Press, 1955), F.N.2, p. 296.

[7]R. A. Scalapino, Democracy and the Party Movement in Pre-war Japan: The Failure of the First Attempt (Berkeley: University of California Press, 1953), pp. 208-209.

[8]Tsurumi Yoshisuke, Gotō Shimpei. 4 vols. (Tokyo: Keisō Shobōsho, 1965-1967).

[9]Warera no Shirareru Gotō Shimpei Haku

[10]Shiroyama Saburō, Nezumi (Tokyo: Bungei Shunjū, 1966), p. 124.

[11]Ibid., p. 125.

[12]Ibid.

[13]Statement by Ishige Ikuji, personal interview, May 1973. Ishige was in charge at Hikoshima immediately after the Mitsui takeover.

[14]Katsura Yoshio, "Sōgō Shōsha to Kanren Kigyō: Suzuki Shōten," Keiei Shigaku, 8:40-41, August, 1973.

[15]Shiroyama, op. cit., pp. 38-39.

[16]Shiraishi Tomoji (ed.), Kaneko Naokichi Den (Tokyo: Kaneko Yanagida Ryōō Shōtokukai, 1950), pp. 106-107.

[17]Statement by Ishige Ikuji: see footnote 13 above.

[18]Fukushima Katsuyuki (ed.), Ichiryū no Mugi (Vol. I of Teijin no Ayumi. Tokyo: Teijin K.K., 1968), pp. 16-17.

[19]Tokinotani Katsu (ed.), Nihon Kindai Shi Jiten (Tokyo: Tōyō Keizai Shimpōsha, 1958), p. 9.

[20]Shiroyama, op. cit., pp. 112-113.

[21]Ibid., p. 117.

[22]Ibid.

[23]Ibid., p. 122.

[24]Ibid., p. 159.

[25]Ibid., p. 117.

[26]Roberts, op. cit., p. 229; and Tokinotani, loc. cit.

[27]Shiroyama, op. cit., p. 39.

[28]Ibid., p. 76.

[29]Ibid., pp. 86-87.

[30]Ibid., p. 87.

[31]Ibid., p. 27.

[32]Ibid., p. 12.

[33]Ibid., p. 85.

[34]Ibid., p. 90.

[35]Ibid.

[36]Ibid., pp. 37-38.

[37]Ibid, p. 38.

[38]Ibid., pp. 88-89.

[39]Ibid., p. 91.

[40]Ibid., p. 138.

[41]Ibid., p. 137.

[42]Ibid., p. 138.

[43]Ibid., p. 139.

[44]Ibid.; and Shiraishi, op. cit., pp. 111-114.

[45]Shiroyama, op. cit., p. 140.

[46]Ibid., p. 159.

[47]Ibid., p. 150; and statement by several of the personnel interviewed by the writer at the Hikoshima Plant of Mitsui High Pressure.

[48]Shiroyama, loc. cit.

[49]Ibid., p. 159.

[50]Ibid., pp. 151-152; and Inoue Kiyoshi and Watanabe Tetsu (eds.), Kome Sōdō no Kenkyū. Vol. I of 5 vols. (Tokyo: Yūhikaku, 1961), pp. 28, 33.

[51]Shiroyama, op. cit., p. 150.

[52]Shiraishi, op. cit., pp. 114-115.

[53]Shiroyama, loc. cit.; Katsura, op. cit., pp. 51-53; and Inoue and Watanabe, op. cit., p. 41.

[54]Ibid., p. 21.

[55]Ibid., p. 41.

[56]Ibid., p. 42.

[57]Ibid., p. 226.

[58]Ibid., 5 vols., passim.

[59]Shiroyama, op. cit., p. 117.

CHAPTER IX

THE FALL OF SUZUKI: THE BANK OF TAIWAN CRISIS OF 1927

I. INTRODUCTION

Suzuki, which probably suffered a severe attack from Mitsui in 1918, appears to have received a mortal blow from its old adversary nine years later. There were two motives for Mitsui's attack in 1927. Firstly, Suzuki's rapid growth in the relatively favourable period between late 1920 and the end of 1922, amply demonstrated the Kobe combine's undiminished potential for aggressive expansion. This cannot but have alarmed Mitsui. Secondly, by March 1927, Mitsui and its political allies were desperately anxious to overthrow the Kenseikai Cabinet, which could only be done through an attack on Suzuki's indispensable financial partner and close collaborator--the Bank of Taiwan. The crisis of the early spring of 1927 afforded both a powerful additional motive for the destruction of Suzuki and the means by which this could be accomplished. Why was Mitsui so concerned to bring down the Kenseikai Cabinet? To answer this we must examine Japan's relations with China in some depth.

II. THE JAPANESE COMMERCIAL WORLD AND CHINA

According to Marx, the political superstructure is governed by the economic base. In the Japan of the 1920's, it was certainly true that China policies were strongly influenced by the commercial commitments of the two giant combines. Before we look at Japanese politics

and the conflicting concepts of China diplomacy at the time of the Bank of Taiwan Crisis, let us first examine the commercial policies of the two Great Zaibatsu.

Mitsui and Mitsubishi differed greatly in their commitment to China. While Mitsui conducted a considerable volume of business there, the scale of Mitsubishi's operations was very small.

Owing to the general paucity of economic information in the twenties, we have no precise knowledge of the relative standing of the two Great Zaibatsu in China at that time. We do, however, have exceptionally detailed data for the mid-thirties, when the Ministry of Foreign Affairs in preparing for war sought to ascertain Japanese strength abroad. In December 1935 and again in December 1936, the Trade Office of the Ministry produced a secret, very detailed global guide, which lists all Japanese firms in each country. It notes all company branches, the total volume of trade of each, and the number of personnel employed classifed according to nationality.[1] TABLE XXXIII[2] shows the relative strength of Mitsui and Mitsubishi in China for the year 1935. While this data represents the situation eight years after the Bank of Taiwan Crisis and the absolute figures for trade are undoubtedly different, there is no evidence that the policies of the two companies had changed in the interim. Thus, these figures can be taken to represent the relative strengths of the two firms in the mid-twenties.

Mitsui, with a total trade of 59,492,254 Standard Chinese Dollars (SCD) had a far greater interest in China than Mitsubishi, with a total trade of only 4,121,800 SCD. Even allowing that the Mitsubishi Zaibatsu

TABLE XXXIII

MITSUI AND MITSUBISHI IN CHINA: DECEMBER 1935

PLACE	MITSUI		MITSUBISHI	
	Company name	Volume*†	Company name	Volume*†
Shanghai	Mitsui Bussan	25,000,000	Mitsubishi Bank	7,400,000
"	Mitsui Bank	88,670,000		
Hankow	Mitsui Bussan	14,000,000	Mitsubishi Shōji	1,500,000
Amoy	" "	5,613,300 (5,500,000 yuan)		
Kwantung	" "	2,328,000 (2,068,000 H.K. dollars)		
Tientsin	" "	2,439,000 (2,500,000 yen) + 1,979,964 (1,940,000 yuan)	Mitsubishi Shōji	700,000
Peiping	" "	612,360 (600,000 silver yuan)		
Chefoo	" "	1,071,630 (1,050,000 yuan)		
Tsingtao	" "	6,448,000 (6,600,000 yen)	Mitsubishi Shōji	1,921,800 (2,000,000 yen)
Total: Trading companies		59,492,254		4,121,800
Total: Banks		88,670,000		7,400,000
Total		148,162,254		11,521,800

*In standard Chinese dollars unless otherwise specified.

†Volume in the case of a trading company indicates total sales per year. Volume in the case of a bank probably indicates deposits on hand.

NOTE ON CONVERSION RATES: 1 standard Chinese dollar = 1.0251 yen = 0.8883 Hong Kong (H.K.) dollars = 0,9798 Yuan Shih-kai or Sun Yat-sen dollar or yuan or silver yuan.

was only half the size of Mitsui, then Mitsui's interest still remains over seven times greater than Mitsubishi's.

While the China trade was a relatively small proportion of the total trade of the two combines, being only 3.3 per cent of Mitsui Bussan's total trade and a mere 0.5 per cent of Mitsubishi Shoji's total trade,[3] the ratio is highly significant as it indicates their differing expectations of the future role of the China trade.

Mitsui's intent to develop the China trade is also well shown by the much greater number of regional offices in operation throughout northern and southern China. Some of these offices were quite heavily staffed for the volume of existing trade. For example, the personnel at Mitsui Bussan's Amoy branch comprised five Japanese, four Taiwanese and eleven Chinese.[4] Mitsubishi, on the other hand, had only skeleton coverage in China. The company had a medium-sized office in Shanghai, rather nominal representation in three major port cities in the north and centre, and no representation whatsoever in the south.[5] The limitation of Mitsubishi's branches to major port cities suggests that, as late as 1935, Mitsubishi Shōji was simply servicing the Mitsubishi subsidiary, Nisshin Steamships, and not attempting systematic development of the hinterland trade.

In banking, there was a similar disparity between the two Great Zaibatsu. In December 1935, the Mitsui Bank in China had total loans outstanding of 88,670,000 SCD, while the Mitsubishi Bank's loans amounted to only 7,400,000 SCD (Table XXXIII). As Mitsubishi was only half the size of Mitsui, we must double the Mitsubishi figure to give a true

proportion, but even so Mitsui still had six times the commitment of Mitsubishi.

Neither zaibatsu had much industrial stake in China. In 1935 Mitsui seems to have had no major direct investment in firms active in China, while Mitsubishi had sizable interests in only two companies. Mitsubishi held stock to a value of 282,000 yen in a total paid-up capital of 1,134,000 yen in Nisshin Flour Mills, while in Nisshin Steamships the zaibatsu held stock of value 4,513,000 yen of a total paid-up capital of 10,125,000 yen. As most of the capital stock in this company was in the form of ships which could easily be withdrawn at times of crisis, Mitsubishi had relatively little at risk.[6]

While we can form a fairly clear idea of the relative commitment to China of Mitsui and Mitsubishi, we cannot make an overall comparison between the two Great Zaibatsu on the one hand and the Suzuki:Bank of Taiwan combination on the other. The two can be compared in trade and industry, but not in banking.

The trading arm of Suzuki, which was closely comparable in total size to Mitsui Bussan in 1920, appears to have placed rather less emphasis on the China trade than Mitsui, though showing a greater commitment than Mitsubishi Shōji. While Mitsui Bussan's total trade in the year 1935 was considerably above that of the mid-twenties, in most of the interim period it was in fact less than the mid-twenties and, thus, it is probably safe to assume that little expansion in the number of branches had occurred in the period. Therefore, in 1927, Mitsui Bussan probably had the same eight branches in China proper as are recorded in 1935. Of the thirty

Suzuki branches outside of the Japanese Empire in the period 1918-1925, seven were in China. These were located at Tsingtao, Shanghai, Tsinan, Hankow, Amoy, Swatow and Fuchow. The firm thus had rather full coverage of the south, but only skeletal representation in the north.[7] This suggests a fairly strong commitment to the China trade.

Suzuki had little investment in Chinese subsidiaries. In 1927, of the firm's seventy-four subsidiaries, only two small companies had head offices in China and were primarily engaged in business in that country. These companies were: China Camphor, incorporated in December 1920 with a fully-subscribed, authorized capital of two million yen; and Yoneboshi Tobacco, incorporated in December 1921 with an authorized capital of one million yen, of which 500,000 yen had been subscribed.[8] China Camphor was probably a manufacturing enterprise producing camphor, but Yoneboshi Tobacco was almost certainly only a sales company.

As in the case of Mitsui, there are detailed statistics of the Bank of Taiwan's very considerable banking activities in China for 1935, but no figures for the 1920's. We cannot, however, simply extrapolate the data for 1935 back to 1927 as we did in the comparison of Mitsui and Mitsubishi, as there was a fundamental change in the management of the Bank of Taiwan in 1927, when it was in effect taken over by Mitsui.

Let us summarize our findings for China in the mid-twenties.

Mitsui certainly had a far greater commitment to China than Mitsubishi and this must have reflected a fundamentally different view of the future of the China trade. This difference in outlook was natural.

Mitsui was historically a trade-centred company and in the mid-twenties the trading company, Mitsui Bussan, was still perhaps the most influential branch of the zaibatsu. Thus, Mitsui looked to expand trade. China seemed a vast potential market close to Japan, which might easily fall under Japanese sway in the not-so-distant future.

Mitsubishi was centred, not on trade, but on the engineering industries. For the products of these industries, the Chinese market offered little potential within the foreseeable future. Neither did China offer a suitable environment for the development of engineering subsidiaries manufacturing for markets outside of East Asia, as technical levels of engineers and tradesmen were low. Mitsubishi, too, was a late-comer in China and lacked depth of contact there. Thus, the combine tended to be cautious in its approach to Japan's giant continental neighbour and was prepared to spend relatively little in national blood and treasure to defend Japan's position there.

We cannot form any estimate of the relative commitment of the Great Zaibatsu on the one hand and the Suzuki:Bank of Taiwan combination on the other since, although they can be compared in trade, we have no figures for the size of the Bank of Taiwan's business in China.

III. POLITICS IN THE MID-TWENTIES

Overview

The Japanese polity in the 1920's comprised two types of institution: the political structure established under the Meiji Constitution of 1889 and the extra-constitutional forces.

The Meiji Constitution recognized the Emperor as a god and the supreme ruler of the national family, and established a number of state organs for the specific purpose of serving the Emperor. These were: the Bureaucracy, the Army, the Navy, the Privy Council and the Diet. The relationships between these organs were not clearly defined in the Constitution and, to a degree, they functioned independently of each other and of central control.

The most important of the extra-constitutional forces in the 1920's were the two Great Zaibatsu. The few residual oligarchs played a relatively minor role.

We will treat only such organs of the state and extra-constitutional forces that appear as actors in the tragedy of the fall of Suzuki. We will not give other than passing mention to those institutions such as the Army which, important as they were, played only auxiliary roles in the action which concerns us. Let us note the general outline of the polity first and deal with the detailed interplay of its forces in the mid-twenties later.

The Diet was the legislative body and responsible for finance, but it was not sovereign. The Emperor, as we have noted, held supreme power. The Diet comprised two houses. The Upper House was largely a non-elective body, composed of aristocrats, millionaires, and other highly influential people. The Lower House, the House of Representatives, was a fully elected body, and chosen by universal male suffrage after 1925. Under the Constitution the Cabinet, which was the executive body, did not necessarily have to be chosen from among Diet members. The normal

political practice in pre-World War II Japan was for the Cabinet to be formed and then, some time later, at an opportune time for the existing government, an election would be held. In prewar Japan, the government never lost an election, thanks to the Cabinet's free use of the public purse to extend bribes and its control of the all-pervasive, Home-Office-controlled police force. The executive body, the Cabinet, was thus distinct from its supporting party in the Diet, but to a degree depended on that party.

The other important organ of government was the Privy Council, which comprised about twenty members, chosen for their past distinguished services. Under the Constitution the Privy Council had been assigned a purely advisory role, but in the twenties it attempted to become a governing body, although it lacked the means either constitutional or extra-constitutional to do so except under unusual political circumstances.

In the 1920's the Privy Council was dominated by Itō Miyoji, who was a member from 1899 to his death in 1934.[9] Itō, born in 1857, had been a very close associate of Itō Hirōbumi and, with some justification, laid claim to oligarch status. Though intelligent and highly skilled at intrigue, his political position in the 1920's was rather weak. He craved political power above all else. He was of humble origin and suffered from an acute sense of insecurity, which was said to be due to a sharp fall in his family's fortunes when he was a child. In the late Meiji he had political contacts among the most powerful, but he alienated most of these men because of his inability to sustain human

relationships. He was "rough, unpolished and abrasive." By the twenties, Itō had broken with the powerful figures of the pre-World War I political world, but had not become closely connected to any strong commercial group.[10] Thus, he sought power through the Privy Council, which comprised only those members who shared his views or who were susceptible to his influence. Itō's extreme chauvinism was shared by many Privy Council members, notably the redoubtable Hiranuma Kiichirō.[11] In his management of the Privy Council, Itō proved to be irresponsible, egotistical and above all unrealistic. In the political circumstances of the twenties, with commercial power in the ascendant, there was no way in which the Privy Council could emerge as the dominant force in politics.

From the very early twenties, Itō Miyoji was a fanatical advocate of the "Hard" China policy and violently opposed the "Soft" Shidehara Diplomacy[12] (see page). Itō does not appear to have had a commercial interest in China, though there is a suggestion of a connection with Mitsui, as he had worked closely with Hara Kei in the 1910's.[13] Probably his prime motivation was national aggrandisement, his inability to recognize reality permitting him to ignore Japan's extreme vulnerability to Anglo-American sea power.

We have previously noted the extra-constitutional role of the oligarchy (see page) in the 1910's. By the mid-1920's, however, few oligarchs were still living and those who remained, although by no means without power, were not in control of national politics. The most important of the oligarchs, notably Saionji, performed the role of Cabinet selection. This is not to say that he and his colleagues

enjoyed a free hand, as forces in the Diet, the other organs of government and, last but not least, the giants of the economic world circumscribed their power rather closely. Nevertheless, they could choose between several candidates for the office of Prime Minister.

Before we close this overview, it would be well to make a few general comments on the functioning of the polity in this period. Japanese politics were far different from those of a modern parliamentary democracy. Politics were not the clash of principle; the struggle of progressives and conservatives. Practical politicians and business or bureaucratic elites had little regard for abstract ideologies. Politics were the conflict of cliques: Mitsubishi versus Mitsui; the Tosa-oriented Kenseikai versus the Chōshū-leaning Seiyūkai; Itō Miyoji and his followers versus the rest. Japan in the 1920's had adopted Western forms of parliamentary democracy, but its ideals were largely alien, not only to the masses but to the overwhelming majority of the elite.

Forces and Policies

The Great Zaibatsu in politics. Only Mitsui and Mitsubishi among the zaibatsu appear to have played a strong and persistent role in Japanese politics in the twenties.

The two giant combines wielded three types of political influence. Firstly, they placed family members, henchmen and associated fellow clansmen in positions of political power. Secondly, they funded the political parties. Thirdly, they influenced the election of Dietmen, especially in the rural areas.

While Mitsubishi and Mitsui both used direct family ties to exert political influence, Mitsubishi laid considerably greater emphasis on this means of control. This was a consequence of the fundamental difference in management structure of the two combines. As we have noted, the Iwasaki family directly managed Mitsubishi under the patriarch, Iwasaki Koyata. Just as the eldest Iwasaki operated the combine by his right as patriarch, so too he sought to influence the political world by the same right. Also, as noted previously, two of the highest-ranking Kenseikai leaders, Katō Kōmei and Shidehara Kijurō, were direct relatives by marriage of the Iwasaki family. Given the authoritarian nature of the Iwasaki family, considerable political power was thus wielded by the President of Mitsubishi when these two politicians held high office.

Mitsubishi also exerted a measure of political influence through regional ties. The Iwasaki family had originated in the area of the Tosa Han, which had gained considerable influence in the Meiji government through its role in the Restoration of 1868. Contacts with fellow clansmen active in the Kenseikai were important to Mitsubishi. Some very prominent members of the party were of Tosa origin. Especially noteworthy was Hamaguchi Ōsachi, Finance Minister in the Katō Cabinet, Home Minister in the First Wakatsuki Cabinet, and Prime Minister from 1929 to 1930.[14] Kataoka Naoharu, who held high office in the Katō Cabinet and was Finance Minister in the First Wakatsuki Cabinet, was also from Tosa.[15]

Mitsui's connections with the Seiyūkai were less blatant, but none the less significant. Consider the Hara Cabinet of 1918. Hara Kei, leader of the Seiyūkai until 1920, was linked to Mitsui through marriage

to a step-daughter of Inoue Kaoru,[16] and the Cabinet also included Uchida Yasuya, a Mitsui kinsman, as Minister for Foreign Affairs, together with Noda Utarō, a protégé of Dan Takuma, as Minister of Communications. In addition, the Mitsui Zaibatsu was indirectly linked through the marriage of associated people with the Chōshū clique of the Seiyūkai.[17]

Mitsui had few regional links. The Mitsui family itself had originated in Osaka, where regional ties were not as strong as those in the more feudal social structures of southern and northern Japan, while the management group which actually ran Mitsui was recruited from many regions.

There is ample evidence that the two Great Zaibatsu funded the two major parties of the Diet. At the time of the First Wakatsuki Cabinet, Mitsubishi funding of the Kenseikai was channelled mainly through Sengoku Mitsugu,[18] while Mitsui used a variety of contacts.

The Great Zaibatsu enjoyed a commanding position in the rural economy, where the smaller zaibatsu were poorly represented. Mitsui, together with Mitsubishi, controlled the entire Japanese fertilizer marketing network.[19] As Japanese agriculture was extremely fertilizer-intensive and highly dependent on artificial fertilizers, this in itself gave the two Great Zaibatsu considerable leverage in rural Japan. The two giant combines also handled about sixty per cent of the production of the widely distributed silk industry, in which over two million rural households were involved as production units.[20] The Great Zaibatsu, especially Mitsui, were also very active in the internal trade in rice and other agricultural produce. In the 1920's, although the

Diet was chosen by elective process, democratic ideals were shallow-rooted in the consciousness of the masses, and the political influence of the Great Zaibatsu cannot have been other than very considerable had they chosen to wield it. And choose to wield it they most certainly did.

The foreign policies of the Great Zaibatsu. It was the Mitsubishi-dominated Kenseikai which consistently supported the "Soft" diplomatic line in China of Shidehara Kijurō. Shidehara, while not going so far as to press for a withdrawal of the Japanese presence in China south of the Manchurian border, was not prepared to apply any considerable force to hold the Japanese position there. The Mitsui-backed Seiyūkai, on the other hand, supported the "Hard" diplomatic line which advocated the use of considerable force to retain and increase the Japanese presence. In this Mitsui and the Seiyūkai were supported by other elements, notably a large section of the Army.

In the first half of the twenties, while the basic thrust of the two diplomacies was diametrically opposed, there was relatively little conflict between their supporters, as the weak Chinese revolutionary movement posed little threat to the Japanese position. It was only later, as the Japanese faced expulsion, that the rival diplomacies were the cause of violent political conflict.

The Suzuki Shōten in politics. With the virtual termination of oligarchical power at the end of World War I, the Suzuki Shōten and the Bank of Taiwan were compelled to seek new political allies. Here the Tosa connection stood them in good stead, as they were able to move in under the umbrella of the Kenseikai through links with the Tosa members

of that party. Many sources note the close relationship of Suzuki and the Kenseikai. For example, Kajinishi[21] comments on Suzuki's dependence on Kenseikai political cover.

Kaneko Naokichi had close relations with at least two very prominent members of the Kenseikai. Through a close friendship with Nakagawa Kojūrō, Head of the Bank of Taiwan, who was of Tosa origin, Kaneko came to be an intimate of Hamaguchi, who was very close to him in age and who had been born in the same city of Kōchi.[22] Kaneko was also close to Kataoka Naoharu, another fellow clansman. According to a report in the Tōkyō Asahi, it was common knowledge that Hamaguchi was a regular recipient of funds from Suzuki.[23] There seems little reason to doubt the reliability of the Tōkyō Asahi's reporting of matters concerning Suzuki in the mid-twenties. There is nothing that would in any way suggest that the newspaper was campaigning against the company as the Ōsaka Asahi had in 1918. On the contrary, in spite of a month of ferocious debate in the Diet during early 1927 over the Earthquake Bills (see page), which all too clearly branded Suzuki as a robber of the public purse, and much public agitation later over the banking crisis which also clearly involved the Kobe combine, there was strikingly little information on Suzuki's political activities in the Tōkyō Asahi. It would seem that the newspaper, in fact, played down Suzuki's role, rather than attempting to pillory the firm.

There is little to indicate Mitsubishi's attitude towards Suzuki in the mid-twenties. We have previously noted that, while there was some evidence of antagonism in the relation of the two firms up to

1918, it was not nearly of the intensity of that which existed between Suzuki and Mitsui, and there was even some indication of cooperation at one period. Mitsubishi must have been at least neutral toward Suzuki, as it tolerated Suzuki's junior partnership with the Kenseikai. While the Mitsubishi Bank made major gains in the Bank of Taiwan Crisis, due to the public's transfer of funds from the smaller to the more secure, larger banks, the giant zaibatsu acquired none of the former subsidiaries of Suzuki when that firm went bankrupt.[24]

While the total commitment of the Suzuki:Bank of Taiwan combination to China is obscure, Suzuki itself certainly had a considerable stake in the current China trade. Why then did the combine not support the Seiyūkai diplomatic line? The answer is simple. Suzuki had no choice but to ally with the Kenseikai, as it was the only political force which offered the combine the protection it so badly needed. The price of this protection of Suzuki as a whole was the vulnerability of the Suzuki stake in China; an obviously acceptable cost, being only a small fraction of the total Suzuki assets.

The Jitsugyō Dōshikai. The Jitsugyō Dōshikai was small in numbers, but its influence was probably much greater than its sheer numerical strength in the Lower House would suggest.

The party was formed in 1923 by Mutō Sanji with the backing of the large textile companies, which as we have seen had amassed considerable reserves by the end of World War I. The Dōshikai's purpose was to represent small- and medium-scale business, as well as the textile firms, thus opposing the zaibatsu power in the political arena. In contrast

to the major parties in the Diet, the Dōshikai, while representing clique interests, did also have principles. The party was a firm advocate of a true laissez-faire economy and had pronounced liberal, democratic leanings, strongly opposing such measures as the Peace Preservation Law of 1925. It campaigned on a platform advocating the complete abolition of the business tax, though the party never achieved its objective. In April 1929 the Dōshikai was reorganized as the Kokumin Dōshikai and sought afresh to oppose zaibatsu power. In 1930, however, the party came into confrontation with the small- and medium-sized businessmen it had sought to organize, and was finally dissolved in 1932.[25]

Mūtō Sanji, who dominated the party, was born in Gifu Prefecture in 1867. He studied at Keio and in the U.S., where he imbibed the principles of laissez-faire capitalism and liberal democracy. After his return from America he entered the Mitsui Bank, but transferred to Kanegafuchi Spinning, then a Mitsui satellite, where he later became Chairman of the Board. He went on to establish Kanegafuchi as an independent company. Mutō was a figure of some stature, being at once a leader in textile circles and a famous politician of considerable courage.[26] His bold attack on Gotō Shimpei, in the June 1923 edition of the magazine Kaizō, for example, attracted favourable notice among liberals.[27] Mutō can only be described as quixotic; he had little real hope of levelling the Great Zaibatsu and their political allies.

In the mid-twenties the existing commitment of Japanese spinning capital to China was considerable[28] (Table XXXIV). The total spindlage

TABLE XXXIV

JAPANESE COTTON INSTALLATIONS IN CHINA AT THE END OF 1924

Name of company	No. of mills	No. of spindles*	No. of looms
Naigai Cotton	14	328.1	1,600
Nikka Weaving	3	133.4	-
Japan Spinning	2	116.1	1,868
Shanghai Weaving	3	99.7	952
Dōkō Weaving	2	69.6	-
Toyota Weaving	1	60.8	400
Oriental Spinning	1	45.6	-
Tōka Spinning	3	45.4	-
Shanghai Artificial Silk	1	42.4	-
Fuji Gas Spinning	1	31.4	-
Manchurian Spinning	1	31.4	504
Nisshin Spinning	1	20.6	-
Nagasaki Weaving	1	20.0	-
Manchurian Prosperity Spinning	1	17.7	-
Total	35	1,062.3+	5,325+

*Spindle number is in thousands

+Totals given are as in source. They are not the exact sum of the preceding columns.

installed by Japanese companies in China by 1924 amounted to no less than one-quarter of that installed in Japan itself. As almost all Japanese investment in textile equipment in China dated from World War I, this machinery was new, unlike much of that in Japan.

The Jitsugyō Dōshikai, backed as it was by textile capital, violently and consistently opposed the Shidehara Diplomacy. The party's numerical strength in the House of Representatives was never large and at no time exceeded ten members. It was not even recorded as a separate party in the election of May 1924, while its strength after the election of February 1928 was only four.[29] Nevertheless, it seems very probable that the Jitsugyō Dōshikai and its associates exerted considerable influence during the Bank of Taiwan Crisis of 1927. Mūtō Sanji and the Dietman Chiba were very active in surface political manoeuvres, and it seems highly probable that the party was a channel for bribe money from textile capital and from Osaka capital in general, which also had a considerable commitment to China.

IV. THE SITUATION IN EARLY 1927

Events in China

Up to 1925 the Japanese had felt confident of their position in China. Their business had been protected by extra-territorial rights and low tariffs were guaranteed by treaty. While there had been some friction between the two nations in China, it seemed in the early twenties that China would continue to offer markets and cheap labour without real protest to the Japanese capitalist.

However, in 1925, came a change. Early in that year strikes developed at several Japanese cotton mills in Shanghai, reflecting widespread unrest that culminated in the revolutionary outburst of the May 30th Incident. From this spark was kindled the May 30th Movement, directed against all foreign penetration, but especially against Japanese and British interests and persons.[30]

In Japanese governing circles a split in opinion developed early. By late 1925, civil and military authorities were expressing alarm. The Japanese military, with an excellent intelligence net in China, expressed fear of Chinese nationalism and also voiced misgivings over communist and Russian participation in the Kuomintang (KMT) leadership. Certain civilian spokesmen, notably Shidehara, the Minister of Foreign Affairs, appeared less concerned, saying that concessions would soon blunt the radical drive of the revolutionaries.[31]

The fears of the military and of those civilian authorities who shared their views soon appeared to be justified. The forces of the Northern Expedition, launched by the KMT on July 9, 1926, rapidly overran most of Southern China and, by the late autumn of that year, were halted immediately south of the Yangtse River within easy striking distance of its great commercial centres. In the winter of 1926-27 there was great agitation in all parts of China and at all levels of Chinese society for the abrogation of the humiliating unequal treaties and the expulsion of the hated foreigner.[32] The whole position of the foreign powers in China now seemed to be in jeopardy.

Britain, which had become the principal target of the Chinese nationalist movement, effected a degree of rapprochement with the KMT, but at the same time made a considerable display of strength, especially in the military reinforcement of Shanghai. Japan, under the Kenseikai Cabinet, took a much weaker line.

In early 1927, Shidehara, though inclining more toward the Canton government than previously, still dealt with Peking, and seemed to have no intention of making a forceful stand.[33] He thus continued to reflect the Mitsubishi policy that there should be no large expenditure of blood and treasure to hold the Japanese position in China. Shidehara offered a rationalization for his position in a speech on January 18, 1927, which has been called the epitome of the Shidehara Diplomacy. He defended his conciliatory posture in China by asserting that China would not acquiesce to Russian guidance for long, and that, over the long term, considerable economic cooperation between China and Japan was possible. He did, however, distinguish between China proper and Manchuria, indicating that it was his intention to hold the latter.[34]

Prior to 1926, Shidehara's policy toward China had been highly unpopular with all who wished to maintain Japan's position there. The Army, Mitsui, the Seiyūkai, the textile manufacturers, the Jitsugyō Dōshikai, together with the Privy Council, had all expressed strong anti-Shidehara views. With the success of the Northern Expedition and the violently anti-foreign attitude taken by the KMT, feeling amongst these groups against the Shidehara Diplomacy leapt to entirely new heights. Shidehara and the Kenseikai seemed determined to take no action.

If Shidehara and his supporter the Kenseikai Cabinet would take no action, then, reasoned the proponents of the "Hard" Diplomacy, the Kenseikai Cabinet must be removed and with all speed.

Until the KMT resumed its northern advance in mid-March 1927, there had been relatively little contact between its forces and foreigners, but, as its troops began to occupy areas in the Central Yangtse Valley where there were a considerable number of foreign residents, numerous violent clashes occurred. Before these incidents the feeling of the masses in Japan had been little aroused, but, as it became evident that "our people" were in jeopardy, public feeling against the "do nothing" diplomacy of Shidehara reached a fever pitch. It was this feeling that was to give the advocates of the "Hard" Diplomacy the opportunity for which they had waited so long.

The Diet

The First Wakatsuki Cabinet, called after its Prime Minister, Wakatsuki Reijirō, took office on January 30, 1926 and fell on April 20, 1927. The composition of the Cabinet[35] appears on Table XXXV.

Let us first look at the balance of party power in the Lower House during the period in which the First Wakatsuki Cabinet held office. The composition of the Diet was determined by the results of the election of May 10, 1924[36] (Table XXXVI). The next election was not until February 20, 1928, well after the resignation of the Wakatsuki Cabinet.

The Kenseikai with 151 out of a total of 464 seats, though clearly the majority party, was far from enjoying an overall majority.

TABLE XXXV

THE COMPOSITION OF THE FIRST WAKATSUKI CABINET:
MARCH-APRIL 1927

Rank	Name
Prime Minister	Wakatsuki Reijirō
Minister of Finance	Kataoka Naoharu
Minister of Foreign Affairs	Shidehara Kijurō
Home Minister	Hamaguchi Ōsachi
War Minister	Ugaki Kazushige
Navy Minister	Takarabe Takeshi
Minister of Justice	Egi Tasuku
Minister of Education	Okada Ryōhei
Minister of Agriculture & Forestry	Machida Chūji
Minister of Trade & Industry	Fujisawa Ikunosuke
Minister of Communications	Adachi Kenzō
Minister of Railways	Inoue Kyōshirō

TABLE XXXVI

ELECTION OF MAY 10, 1924

Party	No. of candidates	No. elected	No. of votes obtained	Total % of vote obtained
Seiyūkai	211	102	661,355	22.41
Kenseikai	264	151	869,028	29.45
Seiyūhontō	239	112	732,182	24.81
Kakushin Kurabu	52	30	182,720	6.19
Unaffiliated	200	69	505,905	17.14
Total	966	464	2,951,190	100.00

The party was usually supported by the 30 votes of the Kakushin Kurabu and by the Seiyūhontō, which had 112 seats. The Seiyūhontō, though numerically strong at this particular time, was not a persistent element in the Diet; its span of existence was short. It had been formed in early 1924 by Tokonami Takejirō, Nakahashi Tokugorō, and their associates, who had split with the Seiyūkai.[37] In the election of May 1924, the Seiyūhontō fought an alliance of the Seiyūkai and the Kenseikai.[38] These alliances, however, were transitory arrangements. By the late summer of 1926, the Seiyūkai was allied with the Seiyūhontō and manoeuvring to overthrow the Wakatsuki Cabinet over the trivial Boku Retsu Case.[39] This alliance may have been a consequence of the beginnings of Japanese apprehension over the success of the Northern Expedition. By early 1927, however, as we shall see, the Seiyūhontō was once more aligned with the Kenseikai.

The Developing Crisis

The weakness of the Bank of Taiwan. As a means to secure liquidity in the period following the devastation of the Great Tokyo Earthquake on September 1, 1923, the government promulgated the Earthquake Bills Discounting Loss Indemnification Law of September 27, 1923. Under this law, bills drawn on those within the area affected by the earthquake could be presented for immediate discount to the Bank of Japan, and those on whom the bills were drawn were not obliged to provide coverage until September 1925. By March 1924, the Bank of Japan had discounted 430 million yen of such bills. Due to a continuation of poor business

conditions, the repayment date was twice postponed, the final termination date being set for September 1927. These bills, discounted by the Bank of Japan, became known as the Earthquake Bills.[40] By November 1924, all but 276 million yen of the bills had been paid off, but a hard residue of 207 million yen of Earthquake Bills remained as unrecoverable debts in early 1927.[41]

As we have seen, the Bank of Taiwan and Suzuki were very closely linked; the two enterprises acted in concert almost as a single zaibatsu. Suzuki had expanded vigorously up to the end of 1922, but few new enterprises were established after that date, which strongly suggests the onset of financial difficulties. In the early twenties, the Kobe combine's debt to the Bank of Taiwan was high, but not dangerously so. In July 1920 the firm's debt to the bank stood at eighty million yen and by December 1923 had only increased to just over ninety million yen.[42]

Business conditions continued to be poor throughout the mid-twenties. From December 1924 to December 1926, the commodity index declined from 229 to 182.[43] Nearly all of the trading companies suffered. We have no figures for Suzuki, but in the years 1923 to 1927 inclusive Mitsubishi Shōji paid no dividends in three of the ten half-yearly periods and, in the remainder, dividends were at much reduced rates. Almost certainly Suzuki's trade too must have suffered severely, and the company's difficulties must have been compounded by the deficits of many of its industrial subsidiaries, which as relatively new enterprises were poorly established.

It is possible that the difficulties of the trading companies were no accident. Certainly some contemporaries thought they were not. Takahashi, for example, commenting on the decline of the commodity index noted: "The decline could not fail to weaken the Japanese economic world. It is said with reason that the losses of Suzuki and Company and the Bank of Taiwan were caused by the manipulation of the exchange policy."[44]

If the exchange rate was deliberately manipulated, it can only have been by the government, which from June 1924 to April 1927 was controlled by the Mitsubishi-backed Kenseikai Cabinets. It may have been that Mitsubishi, though less hostile to Suzuki than Mitsui, strove to greatly reduce the power of the rising company. We cannot be sure. It is also possible that, as Patrick suggests,[45] there was little comprehension of economic theory in the Japan of the 1920's and the adverse effects of deflationary policies were not understood.

Whatever the role of Mitsubishi, the financial position of Suzuki weakened sharply in the mid-twenties and, by February 1926, the firm's debt to the Bank of Taiwan had reached a dangerously high level. Part of the collateral was a considerable amount in valueless Earthquake Bills. By March 27, 1927 the trading company owed fully 350 million yen to the Bank of Taiwan, which amount comprised about eighty per cent of its total debt of 450 million yen.[46] This debt was nominally covered by the assets of Suzuki subsidiaries, which were however set at book values considerably above any realizable prices for their sale. Suzuki's debts were now nearly of the same order as the total paid-up capital of the seventy-three companies of the Suzuki group, which amounted to about

380 million yen.

While the Kobe combine was becoming increasingly financially over-extended between 1924 and 1926, little information leaked until the early months of 1927. This is not so surprising. Private enterprise business in any country is a confidential matter and more so in modern Japan than in the contemporary West. In the Japan of the 1920's, in general, private business was very much more confidential than in contemporary Japan and Kaneko and his lieutenants were past-masters of concealment, even by the standards of their era. In the 52nd Imperial Diet, however, the over-extended position of Suzuki was to become public knowledge.

The debate on the Earthquake Bills. The First Wakatsuki Cabinet presented two measures relating to the Earthquake Bills in the 52nd Imperial Diet during March 1927. These were the Earthquake Bills Discounting Loss Indemnification Public Debt Bill and the Earthquake Bills Remedial Measures Bill. The ostensible purpose of the legislation and, in part its real purpose, was to avert a banking crisis by stabilizing the position of those banks which held considerable amounts of presently valueless Earthquake Bills. The measures were especially aimed at giving support to the semi-official Bank of Taiwan and, to a lesser extent, to the Bank of Korea. The main real intent, however, as the public suspected, was to firm up the position of two major financial pillars of the Kenseikai, the Bank of Taiwan and the Suzuki Shōten.[47]

During the debate which commenced in early March, the Seiyūkai consistently harassed the government, while the Seiyūhonto wavered in its support.

There were probably two main reasons for the opposition of the Seiyūkai. Firstly, as we have seen, the party was very anxious to overthrow the government in order to abolish the Shidehara Diplomacy. Secondly, the Seiyūkai, both in its own interests and those of its principal supporter Mitsui, probably wished to destroy those pillars of the Kenseikai, the Bank of Taiwan and the Suzuki Shōten. The debate on the Earthquake Bills measures seemed a chance--though a very slim one--to accomplish both of these objectives. If the Kenseikai could not secure the passage of this legislation, a major banking crisis would then develop which the government would be unable to check. This would bring down the government under circumstances which would leave Mitsui and its allies free to bring the Bank of Taiwan under their control. The Seiyūkai, however, stood only a slight chance of gaining the essential support of the Seiyūhontō in the division on the Earthquake Bills measures.

While most of the members of the Seiyūhontō lacked the same commitment to the Shidehara Diplomacy as their counterparts in the Kenseikai, they almost certainly supported it to a degree. The Seiyūhontō had originally split off from the Seiyūkai to support the transcendental cabinet of Kiyoura Keigo (June 1922-June 1924), which was associated with the Shidehara Diplomacy.[48]

Kaneko appears to have readily secured a continuation of their support through bribery. At a special meeting of the Seiyūkai representatives on March 3rd, Matsuyama Tsurejirō said that Kaneko Naokichi was then bustling about Tokyo bribing members of the Seiyūhontō. This

report was corroborated by the party leadership, who warned the Seiyūkai members to beware of bribery, stating that bribes had already been offered to some Seiyūkai party members.[49] The Suzuki Shōten appears to have been defending itself with characteristic energy.

On March 3rd the Council of Diet Members of the Kenseikai gave its formal assent that legislation be presented to the Diet to indemnify 100 million yen of the 207 million yen of irredeemable Earthquake Bill debt still outstanding. At a separate location, a similar motion was passed by the Council of Diet Members of the Seiyūhontō.[50] By the end of February, public doubt had already begun to increase regarding the soundness of the Bank of Taiwan, and the opposition parties were quick to seek advantage. In very early March the Jitsugyō Dōshikai initiated pressure for an amendment to the Earthquake Bills legislation to set up a twenty-seven member committee to investigate the management of the Bank of Taiwan in detail. By March 3rd there was already a movement amongst Seiyūkai members to support this stand.[51]

Debate on the bills commenced on March 4th in the Lower House and, shortly after, the matter was taken up in the Upper House. Debate continued until the passage of the two controversial bills on March 23rd. During the debate, the Lower House was tense and, on occasion, was thrown into turmoil by the furious resistance of the opposition parties.[52]

As the debate continued, the government, seeking to justify the indemnification of the residual Earthquake Bills, was compelled to some degree to explain the overloan position of the Bank of Taiwan. Under savage cross-questioning, something of the extent of Suzuki's debt to

the Bank of Taiwan became apparent. On March 11th, at a meeting of the Upper House Committee, the Minister of Finance, Kataoka Naoharu, clarified the debt position of Suzuki with the Bank of Taiwan, stating that, as of February 1926, the firm owed 280 million yen and included in the collateral were 92 million yen of valueless Earthquake Bills.[53]

Prior to the debate on the Earthquake Bills, a mild degree of public apprehension had arisen concerning the stability of the Japanese banking system as a whole. On January 24, 1927 a small rural bank, the Imabari of Ehime Prefecture, had closed its doors. This had been followed by the closure of the Fukatani Trade Bank on the 31st and the Hirobe Bank on February 14th, while two Tokushima banks failed on the 23rd of the same month.[54] While these were all minor banks, the failures were sufficient to implant an element of doubt in the public mind. The debate on the Earthquake Bills, which exposed the weakness of the Bank of Taiwan, further increased public unease. This cannot have been because the public thought the government would allow the bank to fail; the public had great confidence that the bank would be supported. The reason was almost certainly that the revelation of the overloan position of the Bank of Taiwan indicated that a similar condition might exist in other non-official and therefore vulnerable banks.

It was in this atmosphere of some apprehension that Kataoka came to make what has been regarded as the key blunder which triggered off the Bank of Taiwan Crisis. At a plenary meeting of the Appropriations Committee of the Lower House on March 14th, the Minister of Finance was asked a hypothetical question as to what measures the government would

take to combat bank failures should they occur. In the course of his reply, he stated that the Tokyo Watanabe Bank would close its doors at noon that day. In fact, the bank had simply appealed to the Ministry of Finance for help, as the directors feared that without government assistance the bank would be forced out of business.[55] This was the notorious Kataoka "slip of the tongue," and it was a serious mistake. The fundamental cause of the crisis, however, lay elsewhere.

V. THE CRISIS

The Mitsui Plot

Mitsui, as we have seen, was anxious to destroy both the Bank of Taiwan and the Suzuki Shōten and also to end the Shidehara Diplomacy.

The debate over the Earthquake Bills legislation had merely offered an opportunity to embarrass the Kenseikai government. While it was possible that, with the cooperation of the Seiyūhontō, the two bills could have been rejected, the situation of the Bank of Taiwan was not critical, and the government could have waited and reintroduced the bills at a more favourable juncture later or provided some alternative form of support.

The situation in the latter half of March, however, offered very different possibilities, and the evidence strongly indicates that Mitsui decided to use the new circumstances to obtain its ends. The Mitsui plot was simple. Let us look at it in bare outline first and then examine it in detail later.

The first step was to set up a run on the Bank of Taiwan of such magnitude that in a few weeks the bank would require immediate massive support to avoid bankruptcy and the consequent precipitation of a general banking crisis. The Bank of Taiwan was so large that its collapse would certainly endanger the whole of the Japanese banking system. It was to be arranged that the government would be unable to offer such immediate assistance to the Bank of Taiwan and would, therefore, be forced to resign as it was unable to check a major economic crisis. This was to be done by timing the run on the Bank of Taiwan in such a way that its later phase would coincide with the public outcry over the failure of the cabinet's policy in China. Mitsui correctly forecast the great outburst of public anger which occurred when the KMT forces occupied the Yangtse Valley and attacked Japanese property and persons.

The Development of the Mitsui Plot

Now let us examine the development of the plot stage by stage in more detail, discussing the evidence that indicates its existence.

It has been frequently claimed that the Bank of Taiwan Crisis was a spontaneous phenomenon, resulting from a gradual increase in public scepticism concerning the stability of the Bank of Taiwan and thus of the banking system as a whole. This is clearly untrue for two reasons. Firstly, the public did not doubt that the government would support the bank until near the end of the Crisis. Secondly, after a flurry of early bank failures, there was a long lull until the public suspected that the Bank of Taiwan would fall. It was only then that the Bank of

Taiwan and the banking system as a whole came under pressure.

The financial world had tremendous confidence in the Bank of Taiwan for several reasons. It was a semi-official bank with very close connections with the Japanese government. No such bank had ever been allowed to fail before. Furthermore, after the Yokohama Specie Bank, it was the greatest foreign exchange bank in Japan and a pillar of Japanese credit abroad.[56] Were the Bank of Taiwan to collapse, the already tarnished image of the Japanese economy in the West would darken considerably. It was also well-known that the bank was a principal financial supporter of the Kenseikai and in the 52nd Diet the Kenseikai Cabinet had more than amply demonstrated its resolve to support its backers.

Firm proof of general confidence in the Bank of Taiwan is to be found in the reaction to the events of late March and early April. On March 25th the Bank of Taiwan, as part of a compromise between the government and its enemies (see page 363), informed Suzuki that no further loans would be extended, and the Kobe combine is then reported to have suspended business.[57] On April 2nd this became common knowledge, but, although the public were fully aware that the relationship between the bank and combine was so close that the bankruptcy of Suzuki would automatically lead to the fall of the Bank of Taiwan, there was strikingly little reaction either on the day the news was released or for a few days afterwards.[58] Thus, the public must have been very sure that the government would support the company and the bank. It was not until about April 9th that the financial world and the public seriously thought that the bank would be allowed to collapse.

The steady withdrawal of loans outstanding to the Bank of Taiwan which continued from the "Kataoka Blunder" in mid-March well into April, was thus not due to a general loss of confidence in the bank, but must have been deliberately caused by some agent. It is probable that the run was engineered by Mitsui and its allies. There is considerable indirect evidence.

Of that constellation of forces which had a great commitment to China and was desperately anxious to overthrow the Kenseikai Cabinet, Mitsui was by far the most powerful in finance. Only the two Great Zaibatsu were active to a considerable degree in political manoeuvre and it was the Mitsui-backed Seiyūkai which was so active in opposition to the Earthquake Bills legislation. The Seiyūkai was led in the debate by two figures closely linked to Mitsui—Yamamoto Jōtarō and Mori Kaku.[59] The greatest of the zaibatsu was also a long-standing and implacable enemy of the Suzuki Shōten, which would be destroyed were the attack on the Bank of Taiwan to succeed.

Let us now examine the probable role of Mitsui in the Bank of Taiwan Crisis.

The period of financial instability referred to as the Bank of Taiwan Crisis falls into three quite distinct phases of rate of bank failure[60] (Table XXXVII). The first phase was a wave of failures of relatively minor banks between March 15th and March 23rd. The second phase was a lull in which only one minor bank collapsed. The third phase was a further wave of failures between April 8th and April 25th.

The main cause of the first wave of bank failures was undoubtedly the spontaneous growth of public doubt following the debate on the

TABLE XXXVII

THE BANK OF TAIWAN CRISIS: CLOSURE OF BANKS

Name of bank	Location of head office	Paid-up capital	Deposits	Loans	Date of closure
Imabari	Ehime Pr.	2,500	13,805	?	January 24
Fukatani Trade	Saitama Pr.	2,100	2,332	?	January 31
Hirobe	Tokyo	100	4,757	?	February 14
Tokushima	Tokushima City	700	7,705	?	February 23
Tokushima Savings	" "	125	2,007	?	"
Tokyo Watanabe	Tokyo	5,000	38,519	39,989	March 15
Akaji Savings	"	500	5,349	993	"
Nakai	"	5,000	23,255	99,081	March 19
Murai	"	10,000	23,469	45,362	March 22
Eighty-fourth	"	5,000	9,765	13,106	"
Nakazawa	"	5,000	7,427	12,203	"
Sōda	Yokohama	5,000	14,388	14,846	"
Kuki	Saitama Pr.	200	?	?	"
Kuwafune	Kyoto	500	?	?	"
Asanuma	Ōgaki	1,000	4,360	3,721	March 23
Tokushima	Tokushima City	1,300	7,500	5,600	"
Higashi Katsu	Chiba Pr.	400	1,927	?	March 31
Sixty-fifth	Kobe	10,000	18,800	22,900	April 8
Kurate	Fukuoka Pr.	1,500	5,840	5,240	April 13
Kurita	Shiga Pr.	1,000	6,200	5,300	April 15
Kone	Osaka	15,000	137,136	123,429	April 18
Taiwan	Taipeh	45,000	92,806	619,285	"
Uraiku	Shiga Pr.	1,000	2,000	2,400	April 19
Senyō	Osaka	700	1,400	?	"
Kasashina	Hiroshima Pr.	500	1,230	1,500	"

TABLE XXXVII (CONTINUED)

Name of bank	Location of head office	Paid-up capital	Deposits	Loans	Date of closure
Nishiehara	Okayama Pr.	1,000	2,600	2,800	April 20
Hiroshima Industrial	Hiroshima City	3,000	4,040	5,130	"
Moji	Moji	500	100	370	"
Fifteenth	Tokyo	100,000	368,432	372,637	April 21
Takeda Discount	"	500	585	1,126	"
Hataaki	"	5,000	7,600	12,980	"
Akashi Trade & Industry	Akashi	500	1,035	1,150	"
Kawaizumi	Osaka	500	?	?	April 25
Uozumi	Hyōgō Pr.	189	?	?	"
Wakasa	Fukui Pr.	310	?	?	"
Aichi	Saga Pr.	500	?	?	May 16
Industrial	Kagoshima Pr.	750	4,500	?	June 9
Fukushima Trade	Fukushima City	1,075	8,724	13,851	June 13

NOTE: All figures in thousands of yen.

Earthquake Bills and the"Kataoka Blunder." Mitsui, however, seems to have seized on the "Kataoka Blunder" as an opportunity to initiate the attack on the Bank of Taiwan.

On March 15th, the day after the "Kataoka Blunder", the government called on the city banks not to withdraw their call loans to the Bank of Taiwan. The Mitsui Bank was not only the first to withdraw its call loan thus opening the way for others to do so, but also strongly criticized the government's request for restraint.[61] Besides the well-publicized withdrawal of the call loan funds from the Bank of Taiwan, Mitsui was very probably active behind the scenes in initiating the pressure that was to bring the bank to the point of bankruptcy within a month. The Great Zaibatsu probably withdrew loans from a number of banks, which in order to cover themselves made withdrawals in turn of loan money, either from the Bank of Taiwan or from banks which had loans outstanding to that bank. Mitsui was probably aided by allied banks in carrying out this plan. The process of setting up a chain of withdrawals from the Bank of Taiwan would have taken some time, as a considerable proportion of the loans could not have been withdrawn immediately. It was thus necessary for Mitsui to start the pressure on the Bank of Taiwan well before the planned date of bankruptcy of that bank.

Owing to the depressed business conditions of the twenties, there were a number of banks dangerously over-extended and thus vulnerable to the first real pressure applied to them. These were the banks that fell in the first phase of the Bank of Taiwan Crisis. The Tokyo Watanabe Bank certainly fell into this category. It had been unstable since the

bankruptcy of Kamitsuke Muslin in 1924, when it had suffered a loss of 4,500,000 yen.[62]

In the second phase of the crisis up to April 5th, while the banking public retained its confidence in the Bank of Taiwan, withdrawals from the bank continued, though there was little pressure on the city banks, only one minor bank collapsing in this period.[63] This strongly indicates a selective attack on the Bank of Taiwan.

The fall in the pressure on the city banks seems to have been largely due to the ending of the debate on the Earthquake Bills with its disturbing disclosures of the weakness of the banking system. This debate was terminated by an interesting compromise between the government and its enemies which we must note before proceeding to discuss the third phase of the Bank of Taiwan Crisis.

On March 20th the government, alarmed by the magnitude of the run on the banks and especially by that on the Bank of Taiwan, compromised with the opposition and agreed to amend the controversial legislation concerning the Earthquake Bills. The amendments were initiated by Mizuno and Satake of the Upper House Kenkyūkai, which allied with the Kenseikai. They stipulated that the Bank of Taiwan was to be "reorganized," "veteran" (i.e. pro-Kenseikai) directors were to be replaced, and that to effect these changes a committee was to be established to thoroughly investigate the state of the bank. Suzuki, too, was to be "reorganized."[64] As this was an amendment proposed by a pro-government party and, moreover, a party with particularly close ties to Suzuki,[65] the intent almost certainly was to effect a compromise which would protect the Bank

of Taiwan and the combine. The compromise probably involved the offering of a share in the management of the Bank of Taiwan to Mitsui and, in return, the run on the banks including the Bank of Taiwan was to be stopped, thus halting the gathering banking crisis which it was the government's responsibility to check. As part of the agreement, the Suzuki Shōten was to be divorced from the Bank of Taiwan, though it was almost certainly to be granted aid at a later date. Mitsui probably agreed to this compromise at this stage, although the gains were relatively small, as its bargaining position was not yet very strong and the Mitsui leadership was not yet certain of the success of their plot against the government.

Let us summarize our findings so far. We have argued that the run on the Bank of Taiwan was not spontaneous but probably largely engineered by Mitsui and associates. We have further said that, by a compromise agreement with the government on March 20th, the Mitsui forces had gained a degree of access to the Bank of Taiwan, but that Suzuki remained completely beyond their grasp.

Mitsui did not keep its side of the bargain. It aimed at far more than such limited gains. Further withdrawals by the giant zaibatsu and associated banks from the city banks during early April were designed to escalate the banking crisis to a point where the government would be forced to seek aid for the Bank of Taiwan, at a time when such aid could not be obtained due to the public outcry over China. While Mitsui was thus plotting the second stage of its attack on the Kenseikai Cabinet in late March, what was happening in China?

As we have seen, the KMT forces of the Northern Expedition had halted south of the commercial centres of the Yangtse River until mid-March when they resumed their sweeping advance. South of the cities on the Yangtse there were few foreigners and, until the KMT forces entered Nanking on March 18th, there had been correspondingly few incidents. However, as the KMT troops began to occupy the great commercial centres on the Yangtse with their considerable foreign settlements, there were numerous attacks on foreigners, including the Japanese. These attacks were very fully reported in the Japanese press. Some idea of the sense of crisis and of the danger to Japanese residents, together with the sensation which the incidents caused in Japan, may be obtained from the following summary of some of the coverage in that rather objective daily, the Tōkyō Asahi Shimbun.

March 25 - British and American warships start the bombardment of Nanking. The British Consul wounded in Nanking. (66)

March 26 - The leading article on the first page of news covering half a page reported extensive violence by KMT troops, which included an attack on the residence of the Japanese Consul in Nanking. (67)

March 27 - Page 1 was almost entirely devoted to violence in China. One article stated that there was fear in China of a repeat of the Boxer Rebellion as cases of violence against foreigners mounted. The article further noted the great consternation in the U.S. over the situation in China. (68)

March 30 - The leading article described the siege of the Japanese Consulate in Nanking in considerable detail. (69)

April 2 - Almost all of the first page of news was devoted to China. An article noted that both the U.K. and the U.S. emphasized the need for joint action with Japan and quoted the British Ambassador to China as saying that emergency measures were unavoidable. Another article covered the start of the evacuation of Japanese residents from Hankow and the preparation for the evacuation of English people from North China. (70)

April 4 - The leading article on the first page of news described a great and sudden outburst of rioting in Hankow with the resulting evacuation of all of the two thousand foreign residents. (71)

Public opinion in Japan became increasingly inflamed with the news of these incidents in China.

As the situation in China continued to deteriorate, the share prices of the Japanese spinning companies fell sharply and continued to fall until well into April.[72] The fear of a depression caused by the loss of textile markets in China added to the sense of economic crisis in Japan.

Despite the attacks on Japanese residents and the collapse of Japan's political and commercial position in China, Shidehara and the Kenseikai Cabinet did little either to counter the attacks on Japanese residents or to strengthen Japan's position there. In striking contrast, the U.S. and even more especially Britain, took a much firmer line. The British, as we have previously noted, while compromising with the KMT, had militarily strengthened Shanghai very early in 1927, making clear their intention of holding the area by force if necessary. On March 7th Shanghai was further reinforced by 1,600 British troops, who after landing marched through the streets of the city, making a considerable display of force.[73] It was the British and U.S. warships that bombarded Nanking in response to the KMT attacks, while the Japanese warships lay idly at anchor.

Even prior to the violence in China, there had been a rise of public opinion against the Wakatsuki Cabinet over the proposed legislation on the Earthquake Bills, although it was extremely mild compared with

what was to follow. The events of March 18th indicate the strength of public feeling against the Earthquake Bills legislation. On that day, three political organizations, the Seiyūkai, the Jitsugyō Dōshikai and the Jiyū Hōsō Dan, which had formed the United Earthquake Bills Opposition Alliance, held a mass rally at Shiba Park in central Tokyo to protest the Wakatsuki Cabinet's proposed legislation. While the rally passed off without serious incident, the government was clearly alarmed, as fully 1,600 police were mobilized--a number quite unusual in the twenties--and the residences of the Prime Minister and Finance Minister were guarded.[74]

The Diet ended as scheduled on March 26th. In the following days, as the number of incidents in China mounted and the Wakatsuki Cabinet remained an almost passive onlooker, opinion against the government rose to entirely new heights. In this atmosphere, had the government recalled the Diet, it could have expected support only from hard-line members of the minority Kenseikai. The opinion of the electorate, usually of little moment in Japanese politics, now became critically important. The members of the vacillating Seiyūhontō and Kakushin Kurabu now feared to support the government, which therefore had no means of assisting the Bank of Taiwan through the Diet. The significance of the rise in public opinion did not occur to the Cabinet until it was too late.

Mitsui and its associates had realized the significance even in mid-March and were well-prepared to exploit the situation. How had Mitsui been able to time the initial phase of the run on the banks to

take advantage of the "Kataoka Blunder"? The answer is not hard to find. Mitsui's intelligence in China was excellent; far better than that of the Cabinet.

Mitsui had two sources of information in China, both of which were superior to government channels. Firstly, there was Mitsui's commercial net in China which, as we have noted, was very much more extensive than that of Mitsubishi. There is every reason to believe that the commercial net in China collected political as well as trade information. Political factors strongly influence trade, and we know that Mitsui's intelligence net abroad in pre-World War II Europe consistently collected political as well as commercial information.[75] Mitsui's leading spokesmen in the 52nd Diet—the former Mitsui Bussan China executives Yamamoto Jōtarō and Mori Kaku, who had supplied intelligence extensively to the Japanese government during the Russo-Japanese War[76]—would certainly have influenced Mitsui Bussan to stress political intelligence in the China of the twenties. Mitsui's other source of information was Japanese Army intelligence in China, for which Mori Kaku was probably the principal channel. During the 50th and 51st Imperial Diets in 1925 and 1926 he had obtained: "timely and often secret information from the Army and used this in arguments against Shidehara. . . . By these means Mori caused much damage to the image of the Foreign Minister as one conversant with the latest developments and the actual state of affairs in China."[77]

The intelligence of Mitsui was superior, not in the prediction that a KMT attack was imminent, but in the knowledge of the precise timing of the attack and of the intensity of anti-foreign feeling within

the KMT army. It was well-known that there would be a spring offensive by the KMT. Even the national press in early March had noted the concentration of troops by the Northern and Southern forces.[78] According to the diary of Mori Kaku, the Wakatsuki Cabinet appears to have been totally unprepared for the Nanking Incident of late March.[79] The Mitsui group of forces was much better informed.

Had the Kenseikai realized the situation in China and appreciated that, by about April 1st, it would not be possible to recall the Diet in order to vote funds to aid the ailing Bank of Taiwan, should that become necessary, then the party would have obtained sufficient funds in the 52nd Imperial Diet before it terminated on March 26th.

Why did the Cabinet, realizing its position was in jeopardy in early April, not make sufficient show of force in China to satisfy the public mood, allowing the recall of the Diet and the passage of legislation to aid the Bank of Taiwan? There were two reasons. First, the government had confidence in the Bank of Taiwan and, in early April, believed that the period of instability would pass with no further action from the government, as the public reacted very little to the news of the rupture of the link between the bank and Suzuki on April 2nd. The Kenseikai was heavily committed to the Shidehara Diplomacy and panic measures to save the government and Suzuki seemed unnecessary. Second, it is doubtful whether intervention in China in early April, when many incidents had already occurred, would have improved the government's image sufficiently to allow the recall of the Diet.

On April 4th the Bank of Taiwan had seemed relatively secure, but by the 13th the position of the bank was hopeless. Between April 2nd and April 4th there had been very little news in the Tokyo press concerning the Bank of Taiwan or the banking crisis in general, but on the 5th, however, a new mood of alarm was apparent. A meeting of bank heads agreed that measures to stabilize the banks were essential. These bankers included Ikeda of Mitsui, Kushida of Mitsubishi, and the heads of the Bank of Japan, Dai-ichi, Yasuda, Fifteenth, Hundredth, Kawasaki, and Hypothec Banks.[80] On April 9th, Osaka financial circles warned of a financial crisis in the Osaka-Kobe area, where there were already hurried returns of call money, restrictions on lending, and temporary drops in public and private bond prices.[81]

Up to the 13th, the Bank of Taiwan had been able to meet the flood of recalls by the city banks by borrowing from the Bank of Japan, using its stock and discount bills as collateral. On the 13th, however, the bank's store of securities was exhausted and the Bank of Taiwan requested outright aid from the Bank of Japan. Confidence in the Bank of Taiwan was then almost non-existent.

Why was there such a rapid deterioration in the position of the Bank of Taiwan? Two causes have been advanced, but neither offers a satisfactory explanation.

The first cause that has been suggested was the exposure of the overloan state of the Bank of Taiwan by the deliberations of the Bank of Taiwan Investigation Committee, which had started proceedings on April 6th.[82] This seems an unlikely explanation, as little news appeared in the press on the internal position of the Bank of Taiwan. The second

view is that it was the release of the news of the severance of the link between the Bank of Taiwan and Suzuki which led to lack of public confidence. This was the view offered by some Ministry of Finance officials on April 15th, when they accused the Ministry of an unprecedented blunder in divorcing the Bank of Taiwan from the Suzuki Shōten.[83] This explanation, too, seems invalid, as we have seen that there was little reaction to this news.

The only probable explanation is that, by April 5th, the public had realized that the government was no longer able to come to the assistance of the bank and, given the continuing fall in its reserves, the bank was doomed. Public confidence in the Bank of Taiwan collapsed, setting up much greater pressure on the bank, and its reserves fell even more rapidly. The credibility of the banking system as a whole was also called into question.

By April 13th, Mitsui's plot had virtually succeeded. The Bank of Taiwan was in effect bankrupt. There was no way to firm up its position, as it could not obtain loans from the Bank of Japan to meet further demands for recall of funds, due to lack of collateral. Neither could the Cabinet aid the stricken bank by means of funds voted in the Diet, as the Diet could not be recalled. Nor yet could the Cabinet obtain the issue of an Imperial Edict, as the Privy Council was absolutely opposed to the government. All that now remained was a final charade, of interest only because it demonstrates the fanatical determination of the government to stay in power, the motivation for the government's stand, and Mitsui's accurate evaluation of the Privy Council.

The Six-Day Charade

There was no chance that the Privy Council would approve support for the Bank of Taiwan and yet the government, in face of all reason, persisted in pressing its plea for assistance by Imperial Edict to the bitter end. Few if any Japanese governments before or since have been as desperately anxious to stay in office as the First Wakatsuki Cabinet in April 1927. To fall from office under such circumstances would be extremely damaging. There would be a radical change of policy in China with the substitution of the "Hard" Diplomacy for the Shidehara line. There would be the irredeemable loss of the support of the Bank of Taiwan and Suzuki. The former would come under Mitsui control, while the latter would plummet into immediate bankruptcy once no further government support could be obtained, and many of its subsidiaries would be absorbed to strengthen the hostile Mitsui and its associates. The government, too, would carry the odium of failing to stabilize the banking system and, just possibly, of precipitating a grave general economic crisis. Like the proverbial drowning man, the Cabinet grasped frantically at the slightest straw.

On April 13th, as a result of an emergency meeting between officials of the Bank of Japan, the Ministry of Finance, and Inoue Junnosuke, Head of the Bank of Taiwan Investigation Committee, it was proposed that:

1. The government should aid the Bank of Taiwan through the Bank of Japan.

2. As the situation required immediate action, the special authority required would have to be obtained through an Imperial Edict.[84] (This could only be obtained by a majority vote of the full Cabinet and full Privy Council in combined session.)

In the evening of that day, the Prime Minister, Wakatsuki, at a meeting with the same officials, accepted the proposal and a detailed plan for the support of the stricken bank was drawn up.[85] Two motions were to be put to the Privy Council, in order that an Imperial Edict be granted. These motions were:

1. That, by Article 8 of the Constitution, the Bank of Japan should, without collateral, finance the Bank of Taiwan until the end of May 1927. This article stated that, when the Diet was not in session, in cases of urgent necessity, in order to maintain safety and avert public calamity, the Emperor had the capacity to issue an Imperial Edict. This, however, was subject to later review by the Diet.[86]

2. That, by Article 70 of the Constitution, the Bank of Japan should lend to the Bank of Taiwan amounts up to 200 million yen. This article stated that, if at a time when for internal or external reasons the Diet could not be called, an Imperial Edict could be obtained to provide finance, in order to ensure public safety.[87]

The opposition, too, was far from idle. On April 15th, an emergency meeting in Tokyo of the Seiyūkai leadership called for the resignation of the Cabinet, resolving that the proposed action of the government to obtain an Imperial Edict was unconstitutional and would result in a wastage of public funds.[88]

In Osaka, on the same day, the leadership of the Jitsugyō Dōshikai resolved that:

1. The government was moving to treat the Bank of Taiwan and Suzuki as integral organs of the state.

2. No aid should be given to the Bank of Taiwan.

3. Any financial crisis due to the collapse of the bank would be of short duration.

4. The government's unconstitutional use of Articles 8 and 70 might well plunge the nation into political turmoil.[89]

It is significant that the Jitsugyō Dōshikai regarded the government action as a move to support the Suzuki Shōten as well as the Bank of Taiwan, in spite of the fact that the Kobe combine had nominally ceased business on March 25th.

Chiba, a Jitsugyō Dōshikai Dietman, made the rounds of the residences of the Privy Council members, urging them to vote against the government proposal. Government members had made similar rounds spiritedly arguing their case, even though they knew it was a lost cause. Both sides made a special effort to sway Itō Miyoji, the Head of the Privy Council.[90]

On the afternoon of April 15th, a stormy meeting of the Privy Council Investigation Committee, a screening body, debated and completely rejected the government's plea for the Imperial Edict. The committee stated that:

1. Article 8 of the Constitution applied to the avoidance of disasters and the Bank of Taiwan situation did not properly lie within this category.

2. Article 70 of the Constitution was only applicable to a situation in which the Diet could not be called and this was not the case.

3. The Bank of Taiwan had received sufficient relief through the legislation passed in the 52nd Diet, and it was unreasonable to issue an Imperial Edict so soon after this.[91]

In spite of this apparently decisive reverse, the government still persisted. A Cabinet meeting, held on the evening of the same day, resolved that the identical plea that had been rejected by the Privy Council Investigation Committee be placed before the full Privy Council itself under Privy Council Rule 6, Clause 2. By this time, the informed public regarded the fall of the Kenseikai Cabinet as inevitable. This is most clearly evidenced by the almost entire lack of reaction of those most mercurial of indicators, the Tokyo and Osaka Stock Exchanges. They showed almost no change in average price level during the last few days of the Bank of Taiwan Crisis, when the plight of the bank was most desperate and the government most clearly faced collapse.[92] As there was no means by which the government could rescue the Bank of Taiwan, this can only mean that the investing public had fully anticipated the fall of the government and the rescue of the bank by the Seiyūkai and its allies.

In the morning of April 17th, the Minister of Finance, Kataoka, presented a statement of the position of the Bank of Taiwan as of that

date, which clearly showed the absolutely hopeless position of the bank[93] (Table XXXVIII).

In the afternoon of the 17th, a combined meeting of the Privy Council and the Cabinet was held at the Imperial Palace. While some who were ill attended, there were a number of absences which probably indicated the disagreement of the absentees with the opinions of their colleagues. Of a total of twenty-three Privy Council members, nineteen were present, and of a Cabinet of twelve, only Okada, the Minister of Education, was absent.

Although the meeting was held in camera and no official records of its proceedings are available, the press is said to have been very fully informed on all proceedings of the Privy Council. In this particular debate, there is close agreement between all press accounts on the main points, while the accounts show sufficient difference in minor particulars to indicate that they were not compiled from the same original source.

The meeting opened with the report of Hiranuma Kiichirō of the Privy Council Investigation Committee, and he was followed by the Prime Minister, Wakatsuki, who spoke strongly for forty minutes in favour of his motion. Itō Miyoji then spoke. According to all press accounts, Itō said little or nothing about the two motions concerning support for the Bank of Taiwan, but impeached the government in terms of violent abuse for its policy in China. The Minister of Foreign Affairs, Shidehara, who followed Itō, attempted to defend his policy, but was silenced by Itō, who in obvious reference to the apparent fiasco in China said that Shidehara knew nothing whatsoever about diplomacy.

TABLE XXXVIII

BANK OF TAIWAN: STATEMENT OF POSITION APRIL 17, 1927

Debts	Million yen	Assets	Million yen
To the government and the Bank of Japan	400	Debts due	13
To the city banks	490	Deposits on hand in Japan proper	15
Total	890	Total	28

The Minister of Finance, Kataoka, said absolutely nothing throughout the entire course of the debate. Perhaps he was oppressed by a sense of failure to deal adequately with the banking crisis. After considerable cut and thrust, Shidehara made the final speech and, when he stopped speaking, there were a few moments of eerie silence. The meeting then divided and the government motions to secure the Imperial Edict were defeated. All nineteen Privy Council members voted against and all eleven Cabinet members voted in favour.[94] Later that afternoon the government resigned. It was the end for the Wakatsuki Cabinet and the Suzuki Shōten, but two short epilogues remained before the final curtain could come down on the long charade.

The behaviour of Kataoka on the evening following the resignation of the government is of great interest, as it throws considerable light on both his own personal motivation and that of the Cabinet during the crisis. Although he was no longer Minister of Finance, Kataoka was still obsessed with the problem of the support of the Bank of Taiwan. At a meeting that evening with the heads of the major banks, he suggested that the Bank of Japan should exceed its rules and make loans available immediately to support the stricken bank.[95] The Bank of Japan, of course, did not comply with his request. Kataoka's behaviour can only be described as catching at a straw. The Bank of Japan had refused loans to the Bank of Taiwan even while the Wakatsuki Cabinet still had some chance of remaining in office. Now that the next cabinet was certain to be formed by the Seiyūkai, there was absolutely no chance that the bank would extend aid. The Wakatsuki Cabinet had had two basic

motives; to support the Shidehara Diplomacy, and to defend its supporters, the Bank of Taiwan and the Suzuki Shōten. Kataoka's behaviour strongly suggests that the Cabinet had placed much greater emphasis on the latter. Admittedly, Kataoka had as Minister of Finance been more deeply involved than any other single minister in the banking crisis, but once the government had fallen he would have been mainly concerned with the overall interests of the Kenseikai. For Kataoka, the principal loss to the party would seem to have been the forfeiture of the support of the Bank of Taiwan and the Suzuki Shōten, not the relinquishment of control of China policy. It seems probable that other cabinet members had a similar sense of priorities.

Kataoka cannot have thought that a Seiyūkai government would allow the bank to collapse and a general banking crisis to develop. He knew that a Seiyūkai government would support the Bank of Taiwan and, at the same time, bring the bank under the firm control of the party and its allies. Kataoka's intent on the evening of the 17th was not to "save" the Bank of Taiwan from a bankruptcy which would not be allowed to occur, but to preserve the bank as a Kenseikai supporter by securing immediate emergency funding from the Bank of Japan. This would also have firmed up the position of that other pillar of the Kenseikai, the Suzuki Shōten.

It was not only Kataoka who persisted in the pursuit of lost causes. On the afternoon of April 17th, immediately after the disastrous meeting with the Privy Council, the Kenseikai leaders convened a meeting and debated the impeachment of the Privy Council. Grounds for

impeachment were thought to lie in the unconstitutional refusal of the plea for the Imperial Edict and the deflection of the debate to the entirely unconnected China issue. A special meeting of Diet members held on the afternoon of the 18th, however, decisively voted against impeachment.[96] Thus fell the curtain on the six-day charade.

Clearly Mitsui had judged the Privy Council well. By April 13th, at the latest, the Wakatsuki Cabinet lay between two insurmountable walls, instead of moving parallel to one. These walls were, of course, the Privy Council and Diet support. The insurmountable Privy Council wall had existed since the early twenties, while the wall of Diet support had only come into existence with the rise of public opinion against the government's China policy. The end of the road between the two insurmountable walls was blocked by another impassable barrier--the need to aid the Bank of Taiwan after April 13th.

The Jitsugyō Dōshikai had consistently opposed the government, but its full role is obscure. It may have played an important part in swaying the opinions of a significant number of Privy Council members by persuasion, promise of office or favour, or by bribery. We cannot be sure.

VI. THE WINDING UP

The winding up of the Bank of Taiwan Crisis is of considerable interest for two reasons. Firstly, it showed very clearly the hypocrisy of the stand of the Seiyūkai and its associates prior to the fall of the Wakatsuki Cabinet. Secondly, much of Mitsui's motivation becomes

apparent as the material gains of that Great Zaibatsu and its associates are considered.

The Seiyūkai cabinet of Tanaka Giichi, which was formed on April 20th, proceeded to extend exactly the type of support to the Bank of Taiwan and the banking system as a whole, that the Seiyukai had prevented the previous cabinet from offering. The aid they offered was in fact much larger than anything proposed by the Wakatsuki Cabinet.

On April 22nd, the government proclaimed a three-week moratorium on bank debts, while the banking crisis was cleared up. On the same day, an Extraordinary Session of the Diet,which was to last until May 9th, commenced, in which the government awarded support funds of 200 million yen to the Bank of Taiwan and further established a special aid fund of 500 million yen to be disbursed through the Bank of Japan. This aid solved the Bank of Taiwan Crisis. The funds were drawn from the public purse, mostly from the Post Office savings fund. Of the 500 million yen aid, fully 200 million was used to aid the zaibatsu banks. A further 150 million was allotted to indemnify the bill holdings of major banks and financial institutions, which included the Mitsui Trust and the Yasuda, Dai-ichi, Fujita, Hayakawa, Imperial Asahi and Korean Production Banks.[97]

The Bank of Taiwan Crisis had thrown considerable strain on the Japanese banking system, but, in view of the greatly increased amounts on deposit in the major banks after the crisis[98] (Table XXXIX) this so-called "aid" and "indemnification" must be interpreted as funding of private enterprise at the public expense. This was exactly the crime for which Mitsui, the Seiyūkai and their associates had so piously condemned

TABLE XXXIX

DEPOSITS AT THE MAJOR BANKS
BEFORE AND AFTER THE BANK OF TAIWAN CRISIS

Bank	End of 2nd half of 1926 fiscal year	End of 1st half of 1927 fiscal year	Percentage increase
Yasuda	622,505	686,545	10
Mitsui	455,845	538,815	18
Dai-ichi	448,517	510,846	14
Sumitomo	435,149	523,801	20
Mitsubishi	328,834	456,435	39
Thirty-fourth	290,372	315,117	8
Yamaguchi	246,215	260,631	6
Aichi	151,796	162,115	7
Konoike	112,949	116,107	3
Tokyo Watanabe*	38,519	-	-

*The Tokyo Watanabe Bank is added for comparison.

NOTE: All figures in thousands of yen.

the Kenseikai Cabinet. The Tanaka Cabinet made no move whatsoever to indemnify the 180,000 small depositors who suffered losses through bank failures during the crisis.[99]

THE FALL OF SUZUKI: THE BANK OF TAIWAN CRISIS OF 1927

FOOTNOTES

[1]Gaimushō Tsūshōkyoku, Zaigai Hompō Jitsugyōsha Chō (Jō) (Tokyo: Gaimushō Tsūshōkyoku, December, 1935).

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[3]Togai Yoshio, "Komento. Mitsui Bussan to no Taihi ni Oite," Keiei Shigaku, Vol. 8, August, 1973, Table 3, p. 31.

[4]Gaimushō Tsūshōkyoku, loc. cit., and especially p. 390.

[5]Ibid., pp. 288-417.

[6]Japan Manchukuo Year Book (Tokyo: Japan Manchukuo Year Book Company, 1938), pp. 1167-1171.

[7]Katsura Yoshio, "Sōgō Shōsha to Kanren Kigyō: Suzuki Shōten," Keiei Shigaku, 8:46, August, 1973.

[8]Ibid., p. 54.

[9]George Akita, "The Other Itō: A Political Failure," Personality in Japanese History, Albert M. Craig and Donald H. Shively, editors (Berkeley: University of California Press, 1970), p. 367.

[10]Ibid., pp. 335-373 passim.

[11]Tokinotani Katsu (ed.), Nihon Kindai Shi Jiten (Tokyo: Tōyō Keizai Shimpōsha, 1958), p. 524.

[12]Kenneth Colegrave, "The Japanese PrivyCouncil," American Political Science Review, 25:883, 1931.

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[14]Tokinotani, op. cit., p. 509.

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[17]Ibid., p. 226.

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[19]Shibamura Yōgo, "Sangyō Shihongata Kigyō no Seiritsu: Shōwa Hiryō no Sōsetsu to Hatten. Ge," Kagaku Keizai, July, 1966, p. 112.

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[21]Kajinishi Mitsuhaya (ed.), Seni Jō (Vol. XI of Gendai Nihon Sangyō Hattatsu Shi. Tokyo: Tōkōryō, 1964), p. 533.

[22]Andō Yoshio, "Kisei Zaibatsu ka. Narikin Zaibatsu ka," Tatsumi, No. 16, March, 1968, p. 5; and Tokinotani, loc. cit.

[23]Tōkyō Asahi Shimbun, Night Edition, March 4, 1927, p. 1.

[24]Taiwan Ginkō, Taiwan Ginkō Yonjūnen Shi (Tokyo: Taiwan Ginkō, 1939), pp. 317-318; and Asahi Keizai Nenshi (Tokyo: Asahi Shimbunsha, 1928), pp. 222-225.

[25]Tokinotani, op. cit., p. 243.

[26]Ibid., p. 589.

[27]"Mutō to Gotō," Chūōkōron, July, 1923, pp. 2-3.

[28]Kajinishi, op. cit., Table IV-37, p. 393.

[29]Tokinotani, loc. cit. and p. 768.

[30]Iriye Akira, After Imperialism (Cambridge, Mass.: Harvard University Press, 1965), pp. 59-61.

[31]Ibid., p. 66.

[32]Ibid., p. 97.

[33]Ibid., p. 117.

[34]Ibid., p. 111.

[35]Tokinotani, op. cit., p. 689.

[36]Ibid., p. 768.

[37]Duus, op. cit., p. 183.

[38]Ibid., p. 186.

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[53]Rengō Shuppansha, loc. cit.

[54]Terabe Tetsuji and Yasuhiro Koichirō, Ginkō Hattatsu Shi (Osaka: Morino Shobō, 1953), pp. 186-188.

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[66]Tōkyō Asahi Shimbun, Day Edition, March 25, 1927, p. 3.

[67]Tōkyō Asahi Shimbun, Day Edition, March 26, 1927, p. 2.

[68]Tōkyō Asahi Shimbun, Night Edition, March 27, 1927, p. 1.

[69]Tōkyō Asahi Shimbun, Night Edition, March 30, 1927, p. 1.

[70]Tōkyō Asahi Shimbun, Night Edition, April 2, 1927, p. 2.

[71]Tōkyō Asahi Shimbun, Day Edition, April 4, 1927, p. 2.

[72]Tōkyō Asahi Shimbun, Night Edition, April 9, 1927, p. 4.

[73]Tōkyō Asahi Shimbun, Day Edition, March 7, 1927, p. 2.

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[77]Falconeri, op. cit., p. 360.

[78]Tōkyō Asahi Shimbun, Day Edition, March 7, 1927, p. 2.

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[84]Asahi Keizai Nen Shi, op. cit., p. 44.

[85]Ibid.

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[87]Ibid.

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[89]Ibid., pp. 45-46.

[90]Ibid., p. 47.

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[92]Tōkyō Asahi Shimbun, Day Edition, April 15, 1927, p. 4.

[93]Asahi Keizai Nen Shi, op. cit., p. 57.

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[95]Ibid., p. 56.

[96]Tōkyō Asahi Shimbun, Day Edition, April 18, 1927, p. 2.

[97]Yanaga, op. cit., p. 412.

[98]Takahashi, op. cit., pp. 82-83.

[99]Yanaga, loc. cit.

CHAPTER X

EMERGENCE

I. INTRODUCTION

We have argued that, in 1927, when the Great Zaibatsu were at the zenith of their power, Mitsui took advantage of fortuitously-occurring political circumstances to force the Suzuki Shōten into bankruptcy. Suzuki's only ally was the Kenseikai. The forced demise of the combine, which had done so much to advance Japanese industry was scarcely lamented let alone protested by any significant element within Japan.

Just over three years later, however, two rising companies were able to resist an attempt by both Great Zaibatsu, acting in concert, to destroy them, and to enter a period of unhindered rapid growth. In the winter of 1930-1931, as a new revolutionary mood gripped Japan, the two rising companies, Japan Nitrogenous Fertilizers and Shōwa Fertilizers, found ready support amongst elements in the Army, business, and the rural population. To understand the circumstances of the Great Zaibatsu attack on the rising companies, we must first examine the state of the nitrogen industry both within Japan and throughout the world at the end of the twenties.

II. THE NITROGEN CRISIS

The World Background in the 1920's

Organization of the chemical industry. Throughout the twenties the world chemical industry was faced with sharply reduced profits due to over-production in many sectors. In the major manufacturing countries the industry responded by an aggressive policy of intercompany mergers and cartelization.[1] By the late twenties much of the chemical industry in the major producing countries was highly concentrated in closely knit cartels or giant companies formed by mergers. These organizations had great strength in sales, efficiency in internal organization, and were in the forefront of technological advance. They were also closely connected to their respective governments.

In Germany, the birthplace of the modern chemical industry, the move toward intercompany mergers started during the war. In 1916, eight major dye manufacturers began to cooperate in order to meet current war needs and to plan postwar strategy. They formed the Interessengemeinschaft der deutschen Teerfarbenfabriken (IG), which was reorganized and expanded in 1925 to form IG Farbenindustrie AG.[2]

IG Farben was vast, technologically modern, and closely linked with the German government. In 1928 it employed 114,000 workers, or over one-third of the total German work-force in the chemical industry, and its activities covered all branches of the synthetic dye industry, including nitrogenous fertilizer production.[3] In 1928 IG Farben produced 640,000 tons of contained nitrogen, or nearly one-third of

total world production in that year. By 1930, the combine held a near monopoly in Germany of all the technologically new sectors of the chemical industry.[4]

At least some of the constituent companies of IG Farben had close connections with the government. For example, the Badische Anilin- und Soda-Fabrik had received considerable government finance to build strategically important ammonia synthesis plant during World War I, when it had been a major supplier of explosives to the German forces.[5]

In the U.K., the previously sluggish chemical industry, which had been given a great impetus by World War I, was reorganized in the postwar period with the emergence of the giant combine Imperial Chemical Industries (ICI).

ICI was formed in 1926 by the merger of two major and two minor companies. The larger of the two major companies was Brunner, Mond, noted for its development of ammonia synthesis in the early twenties, although the company was primarily an alkali producer. The smaller of the two majors was the conglomerate Nobel Industries, which was a famous explosives manufacturer. The two junior partners were the United Alkali Company and the British Dyestuffs Corporation.[6]

ICI, though considerably smaller than IG Farben, was by far the largest firm in the British chemical industry with 40,000 employees. Its efficiency was comparable to that of the German giant, as its production per capita was approximately equal. ICI dominated British technology. It developed a very large-scale ammonia synthesis plant at Billingham, Co. Durham in the twenties, while conducting research on

high-pressure chemistry which led to the discovery of polyethylene, an important base for the development of plastics in the thirties.[7]

There can be no doubt that ICI was very closely related to the British government, which was intent on promoting the chemical industry throughout the twenties. The government's strong and sustained interest in the industry had commenced in World War I, when there was a panic over the lack of nitrogen compounds for munitions and a critical shortage of synthetic dyes for the textile industry.[8] The intensity of the alarm felt within governing circles during the war is well-shown by the following excerpt from an official report of 1919.[9]

> In future it is clear that every chemical factory must be regarded as a potential arsenal and other nations cannot therefore submit to the dominance of certain sections of the chemical industry which Germany exercised before the war. For military security it is essential that each country should have its chemical industry firmly established and this must be secured as one of the conditions of peace as otherwise we are leaving Germany in possession of a weapon which will be a permanent menace to the peace of the world.

During the war, the government moved to establish vital branches of the chemical industry, laying especial stress on the synthetic ammonia industry. This policy was continued after the war.

In 1918 the Ministry of Munitions had commenced work to establish a 60,000-ton-per-year ammonium nitrate plant at Billingham.[10] Ammonia was to be produced by a synthesis process based on the Haber. Soon after the war, Brunner,Mond became interested in continuing this project, but the firm hesitated to proceed.[11] The probable reasons for the company's uncertainty are not far to seek. The venture involved new, complex technology with a high risk of failure, heavy capital outlay,

and an uncertain market. The limited home demand was already met by by-product manufacturers, and on the international market Chile nitrate was highly competitive. Brunner, Mond's principal objective in ammonia synthesis was to obtain experience in high-pressure, high-temperature gas chemistry, which was so vital to advance in many fields of the modern chemical industry.[12]

When Brunner, Mond decided to proceed with the venture, the government offered very considerable support, and it may well have been the offer of assistance by the government which induced the firm to advance into ammonia synthesis. In 1919, with government backing, the firm carried out a partially successful investigation of Badische's ammonia synthesis plant at Oppau in the French-occupied zone of Germany, despite determined opposition from the German staff.[13] The government further assisted Brunner, Mond in the recovery of British patent rights appropriated by Badische during the war, and promised protection against any action which Badische might take against the British firm for infringement.[14] In an agreement between the firm and the Ministry of Munitions signed on April 22, 1920, all existing plant at Billingham and related technical information were transferred to Brunner, Mond.[15]

The same agreement established Brunner,Mond as an instrument for the implementation of British policy in the chemical industry. The government was to approve all the first directors of the subsidiary set up to develop the ammonia synthesis technology, and all later directors were to be British-born. It was further explicitly stated that the subsidiary was to always remain under British control.[16] Six years

later, ICI was formed to continue the role of Brunner, Mond as chemical defender of the Commonwealth.

Oversupply. Even in the immediate aftermath of World War I there was over-production of ammonium sulphate. In 1919, the German Nitrogen Syndicate, which controlled ninety-eight per cent of domestic production, was formed. The Syndicate was active abroad as well as within Germany and cooperated rather closely with the United Kingdom Nitrogen Syndicate.[17]

By the late twenties, even prior to the World Slump which followed the Wall Street Crash of October 1929, over-production of nitrogenous compounds had become an acute world problem. By 1929, the lag between world production and world consumption was considerable, with world output at 2,110,000 tons of contained nitrogen and consumption at only 1,870,000 tons. After 1929, the gap between supply and demand widened greatly. During the World Slump, demand for fertilizer failed to increase, while productive capacity rose as new plants came on stream. In 1930, world production of contained nitrogen was fully 3,400,000 tons and consumption was only 2,200,000 tons.[18]

The ammonia industries of the U.K. and Germany were in serious difficulties. From the time of the establishment of her industry, the U.K. had been a major exporter of ammonium sulphate, as she had an internal demand of only 150,000 tons (21,100 tons contained nitrogen) in 1920, which increased little during the following decade. By 1930, the biggest British producer alone—ICI—had an output of approximately 320,000 tons of ammonium sulphate.[19] In Germany domestic consumption was constant at approximately 400,000 tons of contained nitrogen throughout

the decade, but production soared, rising to 690,000 tons in 1927-1928 and to 770,000 tons in 1928-1929.[20]

With serious oversupply came government action or threat of action as many of the importing countries moved to safeguard their own infant nitrogen industries. The importance of these exports to the German industry is well shown on Table XL.[21] In all the countries specifically noted on the table, new capacity was either under construction or planned by 1929.

The International Nitrogen Convention. As in the immediate postwar period, the major producers reacted to over-production by cartelization.

In May 1930 the International Agreement on Calcium Cyanamide Sales was signed by Germany, France, Italy, Belgium, Yugoslavia, Czechoslovakia, Roumania, Norway, Sweden, Switzerland and Poland. The agreement covered ninety-two per cent of total world capacity and was to last for eight years.[22]

In August 1930, on the initiative of the U.K. and Germany, came a more general agreement. This was the International Nitrogen Convention, made under the title of Convention Internationale de l'Azote. It was signed by organizations representing the industries of Germany, France, the U.K., Italy, Holland, Belgium, Norway, Poland, Czechoslovakia and Chile, but neither the U.S. nor Japan were signatories. The U.S. did not sign because of the Sherman Anti-Trust Laws of 1890, though in practice she acted in accord with the spirit of the agreement.[23] Japan, who was currently vigorously increasing her capacity in ammonium sulphate, was a principal target of the agreement and not a possible participant.

TABLE XI

GERMAN EXPORTS OF AMMONIA SYNTHESIS PRODUCTS 1928-1929

Country of Destination	Exports (in tons of contained nitrogen)*	% of total
Japan	53,536	20.9
France	43,509	17.0
Holland	43,153	16.8
United States	31,884	12.4
Denmark	16,473	6.4
Other	67,780	26.4
Total	256,335	100.0

*Contained nitrogen is the amount of the element nitrogen in a compound or mixture of compounds.

It is probable that this agreement was negotiated with the full cognizance and active support of government, as the signatory cartels represented important components of national economies which were vital to defence. It is significant that the principal negotiations are said to have been conducted by the U.K., Germany, France and Italy on a warship.[24]

The objectives of the International Nitrogen Convention may be summarized as follows:[25]

1. The objective of the agreement is the regulation of the supply and demand of nitrogenous fertilizers.

2. Price reductions due to over-competition are to be avoided.

3. A future supply of cheap fertilizer to the farmer is to be assured.

4. The agreement is to apply to synthetic ammonia, by-product ammonia, and calcium cyanamide produced in Europe. It is also to apply to Chile nitrate.

5. It is agreed that present capacity will meet world demand for a long time ahead. Thus, during the period of the present contract, no further expansion of capacity is to take place.

6. Financial losses resulting from cut-backs in synthetic ammonia production are to be indemnified by a pool of funds to be established by the organizations participating in this agreement.

7. While each country is to give clear priority to its own industry in the home market, in the colonial markets foreign competition is to be allowed.

The agreement covered ninety-six per cent of European nitrogen production and eighty per cent of world nitrogen production.[26] The signatories to the International Nitrogen Convention formed the International Nitrogen Cartel.

III. THE INTERNATIONAL NITROGEN INDUSTRY AND JAPAN

The Foreign Companies in Japan

As we have noted, throughout the 1920's, Japan imported most of the ammonium sulphate which she consumed, and it was not until 1931 that domestic production exceeded imports (see Table XVI, page 90). In the immediate post-World War I period, the principal foreign supplier was the U.S., but she was succeeded by the U.K., who in turn was succeeded by Germany in the late twenties. In the representative year 1928, the sources of ammonium sulphate imports were: Germany 149,100 tons (53.8%); U.K. 98,200 tons (35.5%); U.S. 28,400 tons (10.2%); and China 1,300 tons (0.5%). Thus nearly ninety per cent of imports were from Germany and the U.K.[27]

All British exports of ammonium sulphate to Japan were handled by ICI and sold by Japan Brunner, Mond, a subsidiary established in 1921 with a head office in Kobe. Prior to the Great Tokyo Earthquake of 1923, the company had sold through the sales networks of Mitsui, Mitsubishi and the Suzuki Shōten, but after this time the company sold directly through its own district wholesalers.[28] By 1930, the firm had eighty-four such outlets distributed to cover the whole of Japan proper with a further seven outlets in Taiwan.[29] Sales were at standard world prices.

The German industry sold through Japanese intermediaries until the late twenties. Ammonium sulphate was imported from the German Nitrogen Syndicate, represented in Japan by Ha Ahrens, which in turn sold exclusively to Mitsui Bussan and Mitsubishi Shōji.[30] In the very late twenties, however, Ha Ahrens too, for reasons which will be discussed later, moved to direct sales and, by 1929, the company had thirty regional wholesalers in the Kansai area.[31]

Up till mid-1929, apart from some collusion between German and British producers in 1928 to reduce American exports of ammonium sulphate to Japan, sales proceeded in a normal commercial fashion. After a sharp fall in the postwar years, the yearly average price of ammonium sulphate had declined gradually[32] (Table XLI), but after August 1929 a rapid and persistent fall in price set in[33] (Table XLII), with the Anglo-German producers consistently undercutting the Japanese. By March 1930, the Tokyo press was even reporting dislocation of the Japanese ammonium sulphate market, due to the sharp price falls of the foreign product.[34] The monthly average price of ammonium sulphate declined from 124 yen per metric ton in July 1929 to 91 yen per metric ton in April 1930.

There is no doubt that this progressive decline in price, coinciding as it did with the beginnings of serious concern in Europe about future world over-production[35] and not with the onset of the World Slump, was due to the deliberate policy of the major Western manufacturers. It did not take long before Japanese producers and prospective producers saw this progressive lowering of the ammonium sulphate price as an attack on the projected expansion of synthetic ammonia capacity in

TABLE XLI

AVERAGE YEARLY PRICE OF AMMONIUM SULPHATE PRODUCED IN JAPAN*

1919	1920	1921	1922	1923	1924	1925	1926
352	315	226	172	191	192	185	149

*Internal price--probably based on the Tokyo Fertilizer Wholesalers Union price lists.

NOTE: All figures in yen per metric ton, i.e. 1,000 Kg. or 2204.6 lbs.

TABLE XLII

WHOLESALE PRICE OF AMMONIUM SULPHATE IN JAPAN 1927-1935*

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1927	136	134	139	137	140	156	129	126	126	123	124	127
1928	127	130	133	134	135	134	124	123	124	123	123	124
1929	115	128	128	129	129	125	124	119	115	111	110	109
1930	103	97	95	91	91	88	91	86	81	76	69	71
1931	73	73	76	88	85	80	80	67	61	60	59	63
1932	74	74	71	63	60	56	56	59	72	73	100	103
1933	101	100	95	97	92	100	93	91	89	89	93	94
1934	92	93	94	96	100	100	97	92	92	92	92	94
1935	96	104	104	113	114	114	109	108	116	123	123	126

*All prices are those of the Tokyo Fertilizer Wholesalers Union for the second day of each month.

NOTE: All figures in yen per metric ton, i.e. 1,000 Kg. or 2204.6 lbs.

Japan.

Early Reactions to the Foreign Offensive

The Japanese manufacturers, greatly alarmed by the offensive, claimed—perhaps correctly—that the European companies were dumping, that is to say, selling at a price below their cost price. In February 1930, for example, it was calculated by the Ōsaka Mainichi that, allowing for freight and insurance, the British selling price FOB Japanese ports should be 110.60 yen per metric ton and the German 116.10 yen, but the actual price was 98.50 yen for both.[36]

The three principal Japanese producers (which manufactured more than seventy per cent of total domestic output) in 1930 were: Japan Nitrogenous Fertilizers, the Mitsui subsidiary Electrochemical Industries, and Japan Artificial Fertilizers, which was also a Mitsui-associated company. These three companies appear to have become seriously concerned at the low prices of foreign sales by March 1930.[37] This suggests that, by that time, the wholesale price of ammonium sulphate, then 95 yen per metric ton, was not far above their production cost. We cannot be sure for, as we shall see later, there is no reliable cost data for the plants of any of these three companies nor, for that matter, of any ammonium sulphate plant in prewar Japan.

In March 1930 the three firms established the Nitrogen Discussion Council and, with four other smaller producers, petitioned for government protection. They sought the invocation of the Unfair Low Price Sales Tariff Law of 1910[38] to obtain a tariff which would support the internal

price of ammonium sulphate. The producers set up a considerable agitation throughout the remainder of 1930, but did not gain governmental support. To explain why this was so, we must digress at some length, and examine the climate of opinion in the country as a whole and in the rural areas in particular.

The Resistance

The rural areas. In 1930, half the population of Japan lived in the rural areas.

Throughout the twenties, farm incomes had been depressed. This was a consequence of the government's policy of importing cheap colonial rice and of the world decline in raw silk prices. The rural standard of living was further depressed by population increase. Many of the enlarged work-force were unable to find employment in the urban areas and remained as under-employed on the family farms. The advent of the World Slump, initiated by the Wall Street panic of October 1929, greatly deepened the rural crisis. There were two main effects. First and most important, was the drastic fall in farm household income from 1929 to 1930[39] (Table XLIII). Secondly, due to the effects of the slump and the retrenchment policies of the Hamaguchi Cabinet, a considerable but statistically unrecorded number of urban workers returned to the homes of their rural relatives.

The importance of cheap fertilizer to the Japanese farmer is easily understood. Fertilizer consumed a considerable fraction of total farming costs. In 1928, for example, the average farm household dispensed

TABLE XLIII

RURAL INCOME IN JAPAN

Year	No. of farms surveyed	Gross income	Farming costs	Net income
1929	66	100.0%	100.0%	100.0%
1930	70	65.5	78.5	53.2
1931	69	60.9	65.4	55.9

about 200 yen per year for fertilizers, comprising thirty-nine per cent of total farming cost and fifteen per cent of total household expenditure. In 1928, ammonium sulphate formed twenty-two per cent of total fertilizer sales and it was also an important component of the compound fertilizers which accounted for a further twenty per cent.[40] As we have noted, with the slump, farm product prices plummeted. Were fertilizer prices to be raised by a tariff, then the farmer would be caught in the scissors of falling product prices and rising production costs.

There was thus tremendous opposition in the rural areas to any increase in the cost of fertilizer. Due to prior developments, this opposition soon found expression in economic and political action.

The advent of the Great Slump found the Japanese farmers by no means unorganized, though their most powerful association, the nationwide federation of Development Cooperatives, had not been highly militant until the slump.[41]

The Development Cooperatives had been formed on government initiative in 1900, and from that time grew steadily with an increase in total membership, number of cooperatives, and financial reserves[42] (Tables XLIV and XLV). The cooperatives covered the whole of Japan. Activity in purchasing and sales also increased rapidly up to 1925 with slower growth in the late twenties[43] (Table XLVI). Some of the individual Development Cooperatives were organized into Associations, each of which covered a Gun. While the number of these Associations showed little increase during the twenties, their reserves, deposits and business activities increased steadily throughout the decade at

TABLE XLIV

DEVELOPMENT COOPERATIVES: NUMBER AND MEMBERSHIP

Year	No. of Cooperatives	Ascertained membership
1900	26	-
1905	1,671	68,563
1910	7,308	534,085
1915	11,509	1,288,984
1920	13,442	2,290,235
1925	14,517	3,935,748
1929	14,047	4,571,785
1931	16,540	4,834,000

TABLE XLV

DEVELOPMENT COOPERATIVES: FINANCE

Year	Paid in funds	Reserves	Loans	Savings	Total*
1905	1,328	211	385	423	2,348
1915	22,186	7,967	16,247	29,617	76,018
1920	55,542	24,558	50,148	224,320	354,605
1925	142,581	61,719	90,390	654,901	949,593
1929	316,248	104,593	197,224	1,108,366	1,626,432

*Totals given are as in source. They are not the exact sum of the preceding columns.

NOTE: All figures in thousands of yen.

TABLE XLVI

DEVELOPMENT COOPERATIVES: SALES AND PURCHASES

Year	Sales	Purchases
1905	1,351	507
1915	40,777	27,549
1920	126,912	152,061
1925	216,017	152,169
1929	254,555	155,174

NOTE: All figures in thousands of yen.

least until 1929[44] (Tables XLVII, XLVIII and XLIX).

The Peasant Unions, which represented the interests of the tenants and poorer farmers, were unrelated to the essentially landlord-dominated Development Cooperatives. The Peasant Movement sprang into existence in 1921 to organize the tenants involved in tenancy disputes into peasant unions. The movement was closely linked to the rise of the proletarian parties in the urban areas and, with their virtual demise in the late twenties, it suffered a considerable setback[45] (Table L). Nevertheless, in 1930, there was still a degree of strength in the Peasant Movement.

A considerable proportion of the rural population was thus organized at the time of the start of the Great Slump. In the late twenties, even prior to the slump, the Development Cooperatives had become somewhat more aggressive in defence of the farmers' interests and, with the onset of the slump, there was a great upswing in their activity.

The Development Cooperatives and Peasant Unions were not the only organizations to represent the interests of the farmer. The Imperial Agricultural Association (IAA) and the Ministry of Agriculture and Forestry (MAF) also took up the cause of the farmer in the latter half of the twenties.

In November 1926 the IAA stated that the domestic manufacturers were making large profits, and pressed unsuccessfully for the establishment of a state-operated plant to sell cheap fertilizer to the farmer.[46] In June 1927 the MAF, also aiming to secure cheap fertilizer supply, succeeded in establishing the Fertilizer Investigation Council, which included

TABLE XLVII

ASSOCIATIONS: NUMBER AND TYPE

Year	Credit Associations	Sales Associations	Purchasing Associations
1910	11	9	5
1915	58	27	35
1920	86	79	110
1925	80	113	113
1930	65	122	122

TABLE XLVIII

ASSOCIATIONS: FINANCE

Year	Paid in funds	Reserves	Loans	Savings	Total*
1912	151	32	344	288	816
1920	2,414	795	7,250	11,560	22,020
1925	9,898	1,664	15,152	59,675	86,391
1929	16,596	3,904	45,775	148,837	215,113

*Totals given are as in source. They are not the exact sum of the preceding columns.

NOTE: All figures in thousands of yen.

TABLE XLIX

ASSOCIATIONS: SALES AND PURCHASES

Year	Sales	Purchases
1912	7,955	126
1920	20,326	6,717
1925	39,560	12,666
1929	59,695	24,281

NOTE: All figures in thousands of yen.

TABLE L

PEASANT UNIONS AND TENANCY DISPUTES

Year	No. of disputes	No. of persons involved	No. of unions
1917	85	?	-
1920	408	39,000	-
1921	1,680	179,000	681
1923	1,917	167,000	1,530
1925	2,206	177,000	3,496
1926	2,052	115,000	4,582
1930	2,478	81,135	?

representatives from the Ministry of Trade and Industry, industry itself, the IAA and other concerned parties. Due to the determined opposition of the Ministry of Trade and Industry, however, which was strongly opposed to governmental control of the fertilizer industry in any form, the negotiations bore little immediate fruit.[47]

In February 1929 the MAF sponsored the Fertilizer Administration Bill which sought to legislate government control of the fertilizer industry. A notable feature of the bill was a clause to establish the Development Cooperatives as distributors and blenders of fertilizer. The bill passed the Lower House in the 56th Imperial Diet, but was stopped in the Upper House, largely because of the massive opposition of the Japan Fertilizer Sales Union, which is said to have represented 50,000 fertilizer trading firms and shops.[48]

Up to 1930, while the organizations acting for the farmer had been almost totally unsuccessful in modifying the system of fertilizer production and distribution, they had kept up a persistent pressure on government and the fertilizer manufacturing industry. Now, in 1930, backed by a slump-stricken and desperate rural populace, their activities greatly intensified and they were to achieve a measure of success.

The anti-tariff campaign. The MAF and the IAA were, from the beginning, violently opposed to the Nitrogen Discussion Council's proposal that the Unfair Low Price Sales Tariff Law should be invoked.

In March 1930, when the proposal first became public knowledge, the IAA decided on absolute opposition at an emergency meeting , and lodged protests with the MAF and the Ministries of Finance, and Trade

and Industry. These protests stressed the desperate plight of the farmer and stated that, even now, Japanese manufacturers were, for the most part, making a comfortable margin of profit.[49]

The determined opposition of the MAF and the IAA continued with undiminished intensity throughout 1930. The IAA, in a strong statement on December 23rd, said that the Development Cooperatives had started to advance fertilizer on credit at low interest rates to the farmer and that, if a tariff were imposed, the IAA would initiate a full-scale boycott of ammonium sulphate outlets.[50]

IV. THE FUJIHARA-BOSCH AGREEMENT

The Significance of the Fujihara-Bosch Agreement

It was in this atmosphere of confrontation and deadlock that the Fujihara-Bosch Agreement (FBA) came into existence. The agreement was the expression of perhaps the most striking confrontation in Japanese industrial history, and its collapse with the emergence of the new companies signalled the end of an era. The failure of the FBA marked the beginning of the end of the Great Zaibatsu hegemony and the start of the rise of the new elements which were to dominate the national scene during the thirties.

The Agreement

There exists no document headed "The Fujihara-Bosch Agreement." Our knowledge of the agreement is based on contemporary leakages of information and on later statements of those close to the Japanese

participants.[51]

The agreement was negotiated by Fujihara Ginjirō and Hermann Bosch. Fujihara was a noted businessman and President of the Mitsui subsidiary, Electro-chemical Industries, who claimed to act as the representative of the Nitrogen Discussion Council. Hermann Bosch, the younger brother of Karl Bosch who played a key role in the perfecting of the Haber Process, was the President of Ha Ahrens and the representative of the International Nitrogen Cartel (INC).

The terms of the agreement, which was provisionally signed during December 1930, were as follows:[52]

1. The Japanese ammonium sulphate industry is not to export.

2. The Japanese industry is to form a cartel and to import ammonium sulphate. The quantity imported is to be: first year, 200,000 tons; second year, 150,000 tons; third year, 100,000 tons; fourth year, 50,000 tons; fifth year, nil.

3. The market price is to be 85 yen per ton.

4. The Japanese industry is not to conduct any expansion of present capacity.

5. All imported ammonium sulphate is to be sold through Mitsui Bussan and Mitsubishi Shōji.

6. The agreement is to last for five years.

The agreement had several startling features. The Japanese industry was to be barred from exporting for five years. The Japanese had not exported a significant amount of ammonium sulphate at any time up to 1930, but it is clear that the INC now feared Japan as a future

competitor on the international market. The Great Zaibatsu had made a remarkable volte-face and had switched from their year-long confrontation with foreign capital to collusion with it. A deal had been made. The foreign companies were to give the Great Zaibatsu the right to market all imported ammonium sulphate at a relatively favourable price of 85 yen per ton, and in return Mitsui and Mitsubishi were to stop all construction of new capacity in ammonium sulphate in Japan. This was an enormous blow to the rising companies and to the emerging Japanese synthetic ammonia industry as a whole.

At the time of the agreement, several plants designed to produce ammonium sulphate by ammonia synthesis were being built.

Construction had commenced at the Kawasaki Plant of Shōwa Fertilizers in August 1930 and was so well advanced by December 1930 that construction of the first production unit was completed by March 1931. Capacity was to be 150,000 tons per year ammonium sulphate.[53]

Noguchi's Korean Nitrogenous Fertilizers (KNF) had a planned capacity of 400,000 tons per year ammonium sulphate. At this time, the Hamhung Plant, which was not scheduled to be completed until the summer of 1931, was still under construction and, of the four hydro-electric plants on the Pujon Kang, only the first (and largest) had been completed. The fourth and last hydro-electric power station was not completed until July 1932.[54] In 1930, production at KNF totalled only 105,418 tons.[55] It is clear that the FBA not only aimed to stop expansion of Noguchi's capacity up to the scheduled 400,000 tons, but at the same time to bankrupt the existing Korean enterprise.

Sumitomo Fertilizer Plant had a factory of 30,000 tons per year ammonium sulphate capacity under construction at Niihama in northern Shikoku. Production was to be by the ammonia synthesis process. At the time of the FBA, construction must have been at a fairly advanced stage, as the plant was in fact completed by April 1931.[56]

Mitsui's subsidiary, Miike Nitrogen Industries, had commenced site clearing in late February 1930 and plant construction had started, though it was not far advanced by December 1930.[57]

V. MOTIVES IN THE FUJIHARA-BOSCH AGREEMENT

Why did the INC and the two Great Zaibatsu draw up the FBA? We have no direct evidence as to the motives of either side, so we must proceed by making hypotheses based on a review of possible advantages and possible threats. Let us consider the two sides in turn starting with the simpler case of the INC.

The International Nitrogen Cartel

The INC had been formed specifically to reduce the production of nitrogenous compounds to the level of existing demand and to maintain the balance of supply and demand in the future. It was very clear by the end of the twenties that this equilibrium was threatened by the considerable new capacity under construction in Japan. One of the principal motives of the INC and perhaps its only major motive for participation in the FBA, was the elimination of this new capacity, at least for several years. While, as we shall see (see page ·), the stipulated sales price

of 85 yen probably did have special significance, it is very unlikely that the INC regarded this price as a critically important guarantee of loss limitation. The INC, had it wished to do so, could have raised the price to the point where substitutes became cheaper.

There is, however, another possible motive for the participation of the INC in the FBA. It pertains to the containment of Japan.

In the London Naval Agreement of 1930, the principal Western maritime powers (the U.K., the U.S., France and Italy) acted aggressively to limit Japanese naval strength. It has been stated, by Yoshihashi for example,[58] that these powers acted in order to cut military spending, as their reserves had fallen with the onset of the Great Slump. This is not a likely explanation. The negotiations for the London Naval Agreement commenced in January 1930, a little over two months after the Wall Street Crash and at a time when few predicted a long depression. The real reason is probably that, by 1930, the powers had become alarmed at Japan's rising technical levels in weaponry, slow though progress had seemed to many Japanese contemporaries themselves. The Naval Powers thus sought to limit the Japanese fleet more strictly than they had in the Washington Naval Treaty of 1922. In the London Naval Agreement, tonnage limits were applied to various categories of non-capital ships, and one of the main clauses of the agreement aimed to greatly retard the advance of Japan's technical capacity in submarine design.[59]

It is possible that the governments of the Western Powers were also anxious to limit the growth of those sectors of Japanese industry which underpinned her military machine. As we have seen, the British

government regarded the chemical industry as a vital, integral component of the national war machine, and attached particular importance to the ammonia synthesis industry. It is very likely that other Western governments shared the British view.

The nitrogen industries of the countries which formed the INC were closely linked to their respective governments. In the case of the U.K., we have already noted that the dominant firm in ammonia synthesis was a quasi-state-affiliated enterprise.

As the governments of three of the most important signatories to the International Nitrogen Convention (the U.K., France and Italy) were also signatories to the London Naval Agreement, it is at least possible that they used the FBA to attempt to halt the advance of the vital Japanese ammonia synthesis industry and, through it, the progress of that country's chemical industry as a whole.

The Great Zaibatsu

While the INC consistently strove to prevent the construction of new ammonia synthesis capacity in Japan from mid-1929 to late 1932, the Great Zaibatsu made a volte-face in policy in December 1930, when the two giant combines swung from a long-maintained support of the two rising companies to confrontation with them.

Mitsui had given a degree of backing to Mori and his associates almost from the time they entered the chemical industry. In the first stages of their negotiations to purchase the rights to an examination of the Ude Process from the Iris Trading Company of Kobe in 1928 (see page

259), Yamamoto Jōtarō had played an important role.[60] Yamamoto was then Head of the Mitsui-linked South Manchurian Railway Company and, formerly, had long been an outstanding figure in Mitsui Bussan. During the investigation of the Ude Process in Europe in late 1928, Mori's associate, who represented Tōshin Electric, cooperated closely with the South Manchurian Railway Company. When negotiations for the Ude Process were proving unfruitful, it was the Paris office of Mitsui Bussan which brought the Fauser Process to the attention of Mori's group.[61] Whether or not this was simply a ploy to force a reduction in the price of the Ude Process is immaterial to the present argument, as Mitsui was clearly involved in an action which was to benefit the investigating group. It is true that Mori's representatives were in the end not allowed to share in the Japanese rights to the Fauser Process in February 1929, but the cause of this refusal probably lay with Japan Artificial Fertilizers, which was the actual possessor of those rights, rather than with the Head Office of Mitsui. Japan Artificial Fertilizers was closely associated with the Mitsui group, but was not a direct subsidiary of Mitsui.

There can be no doubt that the sale of ammonium sulphate from Mori's projected Kawasaki Plant was to be made through Mitsui Bussan and Mitsui-associated fertilizer wholesalers.[62] When construction of the plant started in August 1930, this arrangement was still in force.

As we have seen, cooperation between Mitsubishi and Noguchi had been of long-standing, though by the mid-twenties Mitsubishi was not in control of Noguchi's enterprises. In 1928, Mitsubishi held only 14.2 per cent of the total stock of JNF, compared to the 22.5 per cent held by

Noguchi and associates. JNF held 99.5 per cent of the total stock of KNF.[63]

In the late twenties, Mitsubishi continued to be one of the major financial backers of KNF, though Kushida Manzō, who had succeeded Toyokawa Ryōhei in 1921 as head of the Mitsubishi Bank, had reservations about Noguchi's resolute plunge into the wilds of Northern Korea.[64] Kushida's doubts probably stemmed more from his cautious temperament than from apprehensions over Noguchi's growing power. There is no evidence of a rupture between Noguchi and Mitsubishi until about the time of the FBA.

Why did the Great Zaibatsu change policy so radically? Certainly under the FBA they stood to make some gains.

Both zaibatsu would have an equal share in the profits from the marketing of imported ammonium sulphate. Allowing a handling charge of say 10 yen per ton, for each of the giant combines this would represent a total profit of 2,500,000 yen for the period of the agreement.

Mitsui's subsidiary, Electro-chemical Industries, was probably operating at a considerable loss in December 1930, when the price of ammonium sulphate was only 71 yen per ton. The firm was a high-cost producer, still utilizing the almost obsolete transformed ammonia process. Sales at 85 yen per ton would greatly improve the financial standing of the ailing subsidiary, and it was thought by some contemporaries that the 85 yen price was fixed to equal the costs per ton of Electro-chemical Industries.

Under the terms of the FBA, Mitsui did suffer a definite loss, as construction at the Miike Nitrogen Industries plant was to be stopped. This loss, however, was not as great as it might first appear.

Site clearing at the plant had commenced in late February 1930, but work proceeded very slowly after this. Erection of the steel framework for the factory building did not commence until late June, while work on the bases for the compressors, the nitrogen production plant and the synthesis tower was not started until August. The installation of the main equipment did not begin until November 1930, when the assembly of the nitrogen production equipment commenced. Though construction at the plant never entirely stopped, no start was made on any new section from November 22, 1930 when the installation of the C.O.G. gas compressors began till March 5, 1931 when the fitting of the main gas pipes commenced. The installation of the gas compressors proceeded very slowly and was not completed until April 28, 1931--an inordinately long period of five months.[65] Thus, in December 1930, under the terms of the FBA, Mitsui was abandoning plant which we may estimate at only about one-fifth of the value of the completed factory. To make a financial estimate of this loss, we can make a proportionate reduction of the cost of a 50,000 ton per year synthesis-based ammonium sulphate plant, which was approximately 7,000,000 yen in the early Shōwa Period.[66] Thus, for the 36,000 ton per year plant of Miike Nitrogen Industries, the total factory cost would have been 5,040,000 yen and Mitsui's loss at about one-fifth of this would have been 1,008,000 yen. Mitsui would also lose the future profits of the production from the plant and the wholesaling

profits on that production, but no value can be assigned to these profits.

Balancing those gains and losses which we have noted, Mitsui did not stand to gain greatly under the terms of the FBA. There was, however, another probable gain shared with Mitsubishi which was of a totally different order.

It is likely that the FBA implied the takeover of Noguchi's KNF by the two Great Zaibatsu. There can be no doubt that Noguchi's Korean venture was to be bankrupted and the plant taken out of production at least temporarily. Under the FBA, with no additional capacity to be allowed in Japan over a five year period, 200,000 tons of imports were to be replaced by domestic production. As 200,000 tons per year was the current rate of production at the partially completed plant of KNF at the end of 1930, it seems probable that this capacity was to gradually come back on stream under the ownership of Mitsui and Mitsubishi. The INC executive probably felt that, under the cautious not to say timid management of the Great Zaibatsu, KNF was highly unlikely to develop into a major exporter of ammonium sulphate.

While there were to be very definite gains for the two Great Zaibatsu under the FBA, the very suddenness of their change in policy requires explanation. An agreement like the FBA could well have been arranged at any time within the preceding year. Why then did they wait until December 1930 to make the agreement? It is possible that at that time they were suddenly pressured to take a step which they had previously feared to make, in spite of the advantages it would have brought.

We have already noted that the nitrogen industries of the countries which signed the International Nitrogen Convention were connected to their respective governments. The Western governments may have used political leverage to force the compliance of the Great Zaibatsu for two reasons. Firstly, all of the governments may have acted on behalf of the economic interests of their nitrogen industries. Secondly, those states--the U.K., France and Italy--which had maritime interests may have moved politically against Japan for the strategic reasons we have already noted (see page 410). The government of the U.K. in particular might well have taken this line of action, as she had played a key role in placing restrictions on Japanese power.

Did the Western nations have the capacity to apply political pressure to the Great Zaibatsu in the Japanese homeland? The answer must be an unqualified "yes." There were several ways in which this could be done.

The Great Zaibatsu, especially Mitsui through Mitsui Bussan, depended on the London banks to finance their trading activities in Europe. Should this finance be cut off, then Mitsui's extensive trading activities in that continent would seriously suffer. Roberts suggests that, when Japanese products started to undercut those of the U.K. on the international markets, pressure was in fact applied to Mitsui in the early thirties by threats to curtail borrowings in London.[67]

Action could also be taken by the governments concerned to place discriminatory tariffs on those goods which the Great Zaibatsu exported to their homelands. The British government could also apply pressure

within the Commonwealth. Even in certain areas outside of the Commonwealth Britain was powerful, and tariffs and extra-legal obstructions could be placed in the way of Great Zaibatsu trade. Again, Mitsui, as by far the larger trader, would be more seriously affected.

The British government could also have acted against the Great Zaibatsu by denying them access to the long-term loan facilities of the major financial markets of the world. In 1930 the financial circles of London and New York were still closely linked, and it is probable that pressure from the U.K. government could have excluded the two giant combines from the American as well as from the British centre. Events after 1930 show that such pressure would have been effective.

After the Manchurian Incident of 1931, the Japanese were totally unable to float long-term bond issues as they had in the twenties in the London and New York money markets, because the governments of the U.K. and the U.S., reacting to Japanese military aggression, closed these markets to Japan. Subscription of the Taiwan Electric Power bond issue of July 1931 was never completed, and no further bonds were floated abroad until 1948.[68] In the twenties, the Mitsui Bank and the Mitsui Trust had played a leading role within the private sector in raising funds abroad. In the U.S., where Japan raised most of her foreign capital, Mitsui handled no less than thirty-seven per cent of all Japanese company bonds floated in the period 1914-1930.[69] Once again, Mitsui would have been hit much harder than Mitsubishi, which played no significant role in fund-raising abroad.

In the three types of pressure which we have considered so far, Mitsui would have been far more vulnerable than Mitsubishi. The British

and German governments could probably have struck at Mitsubishi, however, by obstructing the combine's imports of technologically novel equipment. While Mitsubishi Shōji had rather a poor profit record, it was successful to a degree as an importer of new technology,[70] and may well have been formed expressly for that role.

One possible reason for the volte-face in December 1930 is that political pressure was suddenly applied by certain Western nations, which at once feared the Japanese technological advance and had the means to arrest it. There is a further possible cause of an entirely different kind, but we can only discuss this after we have considered the failure of the Great Zaibatsu attempt to suppress the two rising companies.

VI. PRESSURE APPLIED

Mitsui and Shōwa Fertilizers

It was Mitsui which moved to stop the construction of Shōwa Fertilizers' ammonium sulphate plant at Kawasaki, which was scheduled to come on stream in April 1931. Had the FBA succeeded, then Mori would have suffered a tremendous blow, as plant construction was well-advanced by December 1930, and all of the remaining equipment must have been ordered and at least partially manufactured. Mori, as we have noted, had no sales network of his own, and had arranged to sell his product through Mitsui Bussan and associated companies. Now Mitsui, not only revoked its promise to market Shōwa Fertilizers' ammonium sulphate, but also moved to deny the facilities of any part of the complex Japanese fertilizer marketing network to the new company.[71]

Mitsui certainly had the capacity to do this. That the Great Zaibatsu dominated the fertilizer sales network was not doubted by informed contemporaries. Shibamura Yōgo, who was an authority on the Japanese chemical industry and well-acquainted with many who knew the interwar fertilizer industry intimately, said: "In fertilizer sales the zaibatsu stood at the top of the pyramid and controlled everything through the wholesalers."[72] Satō Kanji, perhaps the closest of the contemporary observers to the fertilizer business in all its ramifications, stated that Mitsui and Mitsubishi had "a controlling influence in fertilizer sales."[73]

How was this control exercised? On the basis of presently available information we cannot say exactly, but we can show the great scale of Mitsui's operations in rural business[74] (Table LI) and indicate some of the means the combine may have used to control smaller companies not directly under its sway.

The fertilizer sales network was pyramidal in structure. At the apex were a few great city or market wholesalers, based in the largest Japanese cities, which sold to a much larger number of regional wholesalers located in provincial centres throughout Japan. The regional wholesalers sold to local wholesalers, which in turn sold to the village retail shops. Nearly all of the regional wholesalers handled several types of fertilizer and the majority of them, in addition to selling, blended fertilizers. At the retail level, a survey in 1920 listed more than 21,000 shops giving the sale of fertilizers as their main occupation and, of these, a large number also dealt in cereals.[75]

TABLE LI

MITSUI: THE RURAL COMMODITY TRADE

Type of trade	Commodity	Percentage handled by Mitsui
Export	Raw silk	27
Import	Wheat	40
"	Beans	20
"	Ammonium sulphate	35
"	Phosphate ore	40
"	Chile nitrate	45

Mitsui could, if it so wished, apply pressure in several forms and at a variety of levels. At the regional wholesaler level, for example, Mitsui was in many cases the ultimate supplier of one or more types of fertilizer or cereal dealt with by the wholesaler and, should that wholesaler attempt against Mitsui's wishes to commence dealing in ammonium sulphate, the giant combine could threaten to cut off the future supply of other types of fertilizer or cereals. At all levels of fertilizer marketing, Mitsui could pressure dealers by restrictions on bank credit through the Mitsui Bank and the Mitsui Trust. Where direct pressure would not be effective, then other banks could be influenced to carry out Mitsui's will. Where the dealer himself was not vulnerable to such leverage, often his relatives were. In the twenties, Mitsui was a powerful force in rural Japan.

Mitsubishi and Korean Nitrogenous Fertilizers

By late 1930, it might have seemed that JNF's subsidiary, KNF, was completely at the mercy of the Mitsubishi zaibatsu. The great combine appeared to have placed KNF in a situation where it would operate at a loss for at least the five year duration of the FBA. Let us examine just how KNF was caught in a position where costs were above selling price.

Costs at Korean Nitrogenous Fertilizers. As we have seen, in June 1925, Noguchi had obtained the water rights on the Pujon Kang drainage system, while Mitsubishi had obtained those on the Changjin Kang. Changjin Kang was unquestionably the greater prize. Estimates in 1925 show that the Pujon Kang had a capacity of 201,400 kilowatts

developable for a total expenditure of 42 million yen or 209 yen per installed kilowatt, while the Changjin Kang had a capacity of 413,000 kilowatts developable for 65 million yen or 157 yen per kilowatt of installed capacity.[76]

Noguchi constructed a large dam, creating a reservoir to supply four hydro-electric power stations, which were to generate electricity for use at the Hamhung Plant and township about eighty kilometres to the south-east. The largest power station, the Number One, was finished in November 1929, the smaller Number Two and Number Three power stations in October 1930, and Number Four the smallest at the end of 1932.[77] All the generating capacity appears to have been installed as planned.

However, Noguchi's move into Korea, as we have seen, had been made in great haste, and it had not been preceded by an adequate hydrological survey. A water level of one hundred feet had been planned at the dam, but in fact the water reached a maximum of only forty feet[78] and, when the four power stations were in full operation in 1933, instead of the forecast 200,000 kilowatts output only 80-90,000 kilowatts were actually produced. By late 1930, it must have been all too apparent that the average run-off of the Pujon Kang drainage system was very much less than had been predicted in 1925. Construction on the great dam of the Pujon Kang had started in July 1927 and was completed by November 1930.[79] It was almost certainly filling for at least two years prior to its completion, so that by the time of the FBA more than two full years of run-off had been collected. The JNF subsidiary, Korean Hydro-electric, would also have conducted detailed hydrological surveys of the Pujon Kang drainage system from

the time of the foundation of the company in January 1926, giving nearly five years data to estimate average run-off.

KNF was, therefore, obtaining less than half the planned output of electricity, though full capital expenditures had been made, and thus the interest component in the costs per ton must have been approximately doubled. What, in fact, were Noguchi's costs per ton of ammonium sulphate?

We cannot be sure. As we have noted, KNF in common with other fertilizer manufacturers published no reliable cost data. Neither can costs be calculated, as there are so many unknowns. We do not know the total cost of Noguchi's hydro-electric project, nor the proportion of the total outlay which Noguchi borrowed, nor the interest rates at which he borrowed. We do not know how much of the chemical machinery at the Hamhung plant was purchased outright and how much was purchased on equipment manufacturers' loan, nor on what terms these loans were made. There is also no way of ascertaining Noguchi's operating costs at Hamhung.

We can, however, form some idea of Noguchi's costs per ton with the operation running at the late 1930 level of about 200,000 tons ammonium sulphate per year. We have already noted that Noguchi appeared to have become seriously concerned in March 1930, when the price of ammonium sulphate fell to 95 yen per ton, suggesting that his costs were not far below that figure. In late 1932, with foreign ammonium sulphate largely excluded from Japan by the devaluation of the yen, the internal price of ammonium sulphate rose very sharply from the abysmally low

levels of the previous two years, and maintained a plateau at close to an average of 95 yen per ton from November 1932 to January 1935 (Table XLII, page 402). The flatness of the ammonium sulphate price curve in this period strongly suggests that there was a price range fixed by the Japanese industry. Noguchi participated in all intercompany agreements, and this price range was probably fixed so as to guarantee a modest profit to Noguchi's Korean enterprise, which in the early thirties was probably the highest cost producer in the Japanese empire. So, on this line of reasoning, if we allow a ten per cent profit margin, Noguchi's costs in 1933-1934 when production at Hamhŭng was in the 250-300,000 ton per year range would have been of the order of 86 yen per ton. In late 1930, with production running at about 200,000 tons per year and with less operating experience, costs would certainly have been somewhat higher than the 1933-1934 figure; perhaps somewhat above 90 yen per ton. Summarizing, we may say that Noguchi's costs in late 1930 were probably somewhere in the 90-95 yen per ton range.

Contemporary sources certainly clearly indicate that KNF was operating at a loss during most of 1930 and all of 1931,[80] when the average price of ammonium sulphate per ton from April 1930 to December 1931 was 76.6 yen (see Table XLII, page 402), and this figure sets a definite lower limit to KNF's costs.

The Mitsubishi squeeze. Mitsubishi mounted a two-pronged attack on Noguchi's faltering fertilizer empire in Korea. The Great Zaibatsu withdrew its financial support[81] and also refused Noguchi access to the Changjin Kang drainage area.

The termination of financing probably had two objectives: to halt further construction and to cut off the funding which compensated operating losses.

The refusal of the potential capacity of the Changjin Kang to Noguchi almost certainly guaranteed his loss position for at least the five year span of the FBA. It is very probable that the 85 yen per ton ammonium sulphate price stipulated in the agreement was chosen so as to allow Mitsui's Electro-chemical Industries to break even and, at the same time, to bankrupt KNF by forcing the company to sell at a price which was less than its cost price. If the FBA held as the Great Zaibatsu planned, then Noguchi was faced with five years of deficit operation and could expect no loans to subsidize him.

VII. THE BREAKOUT

Toward Revolution

As we have said before, during the twenties, the Great Zaibatsu had virtual control of much of the economy and enormous influence in politics. Now, in 1930, the power of Mitsui and Mitsubishi was shaken by the upsurge of revolutionary feeling which was especially strong in the depression-stricken countryside. What was the precise nature of the new mood, and what were its manifestations?

The new revolutionary feeling was violently nationalistic and anger was specifically directed at the Great Zaibatsu, who were branded as enemies of the nation. From 1930 on, the two giant combines came increasingly to be pilloried for their unpatriotic activities and their

oppression of the people. The charges against them were varied. There were the notorious dollar-buying incidents when the giant combines had been seen to profit at the national expense. There was a widespread feeling that the zaibatsu in general and the Great Zaibatsu in particular had failed the nation by the inadequacy of their efforts to establish the new, strategically vital, heavy and chemical industries. Great Zaibatsu oppression of small producers and sellers in both urban and rural areas had incurred the hatred of the oppressed, and Mitsui in particular was held culpable. Their great political power was, of course, notorious.[82]

Obvious manifestations of the new revolutionary mood came in 1931 and 1932. The March Plot, the Manchurian Incident and the October Plot of 1931, the Blood-Brotherhood Assassination Conspiracy of early 1932 and the closely related May 15th Rising of the same year, are all well-known. While the groups which brought about the revolutionary incidents of 1931 were not connected to large-scale mass movements, they were emboldened to act by the new mood. The Great Zaibatsu, now facing bitterly hostile public opinion, no longer enjoyed their old easy mastery of Japan, and could not take adequate counter-measures against the revolutionary activities of 1931.

The revolutionary activity of 1932 was directly rooted in rural anger. The plan of the rural-based Blood-Brotherhood well expressed the ferocity of the new mood in the countryside. Their assassination list encompassed the leading figures of every section of the entire contemporary Japanese establishment. Great Zaibatsu leaders, Great Zaibatsu-linked politicians, oligarchs, "that latter day genrō"[83] Itō Miyoji and,

as an especial titbit, the Speaker of the Lower House of the Diet, a relic of the shogunal aristocracy, Tokugawa Iesato, were all to die.[84] Closely linked to the Blood-Brotherhood were the naval officers and the peasants, who carried out the May 15th Rising of 1932. This incident, which ended the era of party cabinets, so alarmed the government, that an Extraordinary Diet of the same May voted a civil-works program costing the unprecedented sum of 160 million yen for the balance of 1932, together with a further 200 million yen to cover 1933.[85]

While manifestations of the revolutionary mood in the form of overt armed insurrection did not occur until early 1931, even by early 1930 there were strong indications of heightened resentment. We have already noted the determined opposition of the Ministry of Agriculture and Forestry and of the Imperial Agricultural Association to the proposed ammonium sulphate tariff during 1930. This increased activity was certainly in response to a desperate rural need, but it reflected more than this. What gave a new boldness to the Ministry of Agriculture and Forestry and the Imperial Agricultural Association was the support of the revolutionary sentiment bred by the slump.

Further evidence of a changed climate of opinion is to be found in the much more aggressive approach of the Ministry of Agriculture and Forestry towards control of fertilizer marketing in 1930. As we have noted, up to 1930, the attempts of the Ministry to effect even the slightest reforms in the fertilizer sales system had been doomed to failure, due to the opposition of fertilizer sales middlemen and the manufacturers who stood behind them. However, with the establishment of

the Fertilizer Distribution Investigation Council in January 1930, there came a change. Due to the influence of the Council in the August of that year, the Ministry of Agriculture and Forestry provided that a total of 4,083,065 yen was to be spent on improving fertilizer distribution and information services.[86] The Ministry planned to act through the All Japan Purchasing Union (AJPU), which was a branch of the Development Cooperatives association.[87]

Thus, not only had the Ministry of Agriculture and Forestry taken a much more aggressive stand, but that stand was fully supported by the newly militant Development Cooperatives and the Imperial Agricultural Association. The magnitude of the blow struck by the establishment of the reformed fertilizer sales system is shown by the reaction of the astounded fertilizer merchants. They petitioned the Ministry of Agriculture and Forestry for equality of treatment with the AJPU and commenced a movement against that union which was to be intense and long-sustained.[88]

Mori Breaks Free

It was the rise of anti-Great Zaibatsu revolutionary feeling which rescued Mori's Shōwa Fertilizers.

We have noted the early rise of the Development Cooperatives and described their militancy under the stimulus of the Great Slump and revolutionary nationalism. It remains to discuss the specifically anti-Great Zaibatsu thrust of the now-embattled Development Cooperatives in more detail. In 1930, conflict between rural producer and urban

supplier was particularly intense in raw silk and fertilizers--exactly where Great Zaibatsu influence was strongest. The Development Cooperatives and their allies cannot but have regarded the two combines as their greatest enemies.

Backed by the government provision of August 1930, the AJPU expanded its buying operations. The union found a temporary ally in Mori,[89] as both were opposed to the Great Zaibatsu. Mori was trying to find a marketer for his fertilizer output in the face of Mitsui's determined opposition, while the AJPU was attempting to break the long stranglehold of the Great Zaibatsu and their middlemen over the countryside. Its immediate objective was to avert the price increase threatened by the FBA.

The Great Zaibatsu, in supporting the FBA, must have thought that the AJPU would fall a ready prey to their usual pressure tactics, but this was not to be the case. When the trial of strength came, it seems that the AJPU was able to defy them. While the agreement between Mori and the AJPU was not signed until June 1931 when Mori's Kawasaki Plant had achieved significant production, tentative agreement must have been reached at the time of the FBA in December 1930, as construction of the plant continued apace.

The terms of the agreement were:[90]

1. Shōwa Fertilizers is to supply the AJPU to the limits of the company's capacity.

2. In the production year 1931 (August 1931 to July 1932) 100,000 tons are to be supplied.

3. The agreement is to last three years.

4. There is to be no interruption of fertilizer sales for any reason whatsoever.

There is no mention of price in the agreement, but it would certainly have been set well below the FBA figure of 85 yen per ton.

The agreement did not run for its full term. This is not at all surprising, as the two signatories had contrary long-term objectives. The position of the AJPU, seeking cheap fertilizer for the slump-stricken farmer, was diametrically opposed to that of Shōwa Fertilizers which, in the long term, sought price maximization through cartel action. It was only for a relatively brief span that such an antagonistic pair could join forces in a temporary alliance against the common Great Zaibatsu enemy. As the 1930's progressed, the AJPU fought nobly and successfully on behalf of the farmer, while Shōwa Fertilizers became a prominent element within a new constellation of military and economic forces, which held sway in place of the Great Zaibatsu.

The Unbinding of the Korean Prometheus Noguchi

Like Mori, Noguchi was freed by the rise of anti-Great Zaibatsu revolutionary feeling, but the mode of his release was entirely different. Mori gained freedom through a very temporary alliance with a bitter enemy of the fertilizer manufacturing industry and of the industrial elite in general, but Noguchi was freed by the direct support of a number of elements which later came to form part of the military-economic establishment of the late thirties.

We have noted that, backed by the FBA, Mitsubishi planned to bankrupt Noguchi by denying him finance and access to Changjin Kang hydro-electric power, but a constellation of forces supported Noguchi against the combine.

Opposition to the major zaibatsu in general and the Great Zaibatsu in particular had arisen among certain elements in the military and the bureaucracy by the late twenties, and these elements sought to gain the support of the rising companies. These opposition groups in concert aimed to take control of the Japanese Empire, and planned to make their first moves in Manchuria and Korea, not in Japan proper. The centre of the rebellious forces was Ugaki Kazushige.

The rebellious groups, seeking vantage in the rise of revolutionary feeling, moved against the government in the ultimately abortive March Plot of 1931. The participants in the plot to install Ugaki as Prime Minister were: the "Control Faction" of the Army, of which Ugaki was a leader; the Sakurakai; and certain civilian ultra-nationalist and left-wing organizations.[91]

All the principal elements involved were from the upper strata of Japanese society and their aim was to institute their own hegemony in place of that of the Great Zaibatsu. They did not plan a social revolution. Significantly, what stopped the coup was not action by the government, but the adamant opposition of the Imperial Way Faction of the Army, which had genuine leanings toward social revolution.[92]

Noguchi found a natural ally in Ugaki, who was Governor-General of Korea in the late twenties and early thirties. The general was not only opposed to the Great Zaibatsu, but was also intent on the development of Korea. The support which Ugaki gave to Noguchi after December 1930

appears to have been the first definite blow in the campaign of the "Control Faction" and its allies against Great Zaibatsu control of the politico-economic establishment.

Partly as a consequence of his association with General Ugaki, Noguchi also formed a close and fruitful connection with the government-controlled Bank of Korea and its Head, Katō Keisaburō, a long-time resident of Korea.[94]

By January 1931, the FBA was broken. Mitsubishi had tried to bankrupt Noguchi by cutting off funding and by excluding KNF from access to Changjin Kang hydro-electric power, but with the emergence of the Ugaki-led alliance of anti-Great Zaibatsu forces Noguchi could not be coerced. His funding was continued by two major banks, the public money market remained open to him, and he was to receive the hydro-electric rights on the Changjin Kang.

When, very late in 1930, Mitsubishi cut off its funding of KNF, the Sumitomo Bank and the Thirty-Fourth Bank, which had also financed the company, continued to supply funds as before. In addition, some millions of yen were raised on the open market.[95] The funds were used to complete the construction of the plant and township at Hamhung and also to offset production losses.

The continued support of the Sumitomo and Thirty-Fourth Banks is of considerable interest, as it showed that, by December 1930, these two banks were both willing and able to stand against Great Zaibatsu pressure. Both Sumitomo and the Thirty-Fourth Bank, it appears, were eager to end the hegemony of the Great Zaibatsu.

Sumitomo had been repressed by the Great Zaibatsu in the past and had suffered recent provocation, as construction of the Niihama Plant, then at a fairly advanced stage, was to be terminated under the conditions of the FBA. The Thirty-Fourth Bank was an organization of some consequence. It was linked to the textile major, Japan Spinning, and, together with two other pillars of Kansai finance, the Yamaguchi and Konoike Banks, moved to establish a position of strength to combat the Great Zaibatsu and Sumitomo.[96] In 1933, with the backing of Nakane Sadahiko, the Director of the Bank of Japan, in an explicitly anti-major zaibatsu move, the three banks merged to form the Sanwa Bank, which became the largest in Japan. Nakane, who was the former Head of the Osaka branch of the Bank of Japan, is said to have been personally opposed to the tyranny of the Great Zaibatsu and Sumitomo Banks.[97] The cooperation of the Thirty-Fourth Bank with Sumitomo in the funding of KNF appears to have been a tactical move.

Both Sumitomo and the Thirty Fourth Bank were undoubtedly encouraged in their stand by the rise of public opinion against the Great Zaibatsu and by the emerging constellation of anti-Great Zaibatsu forces which provided powerful support for their stand. They also probably felt assured of the return of their loan funds, as they thought that the hydro-electric rights on the Changjin Kang would soon be transferred from Mitsubishi to Noguchi. If so, they were over-confident. With the failure of the March Plot, the Government-General of Korea did not aid Noguchi until late 1931 and then only on a small scale. It was not until 1933, when the"Control Faction" and its allies had strengthened their

position, that the Government-General extended massive assistance to the Korean Prometheus.

The first assistance which Noguchi received from the Bank of Korea was not until December 1931 and was only five million yen.[98] In April 1933, the water rights on the Changjin Kang were transferred to KNF and, about this time, a forty million yen loan was extended by the Bank of Korea.[99]

While the collapse of the March Plot was undoubtedly the main reason for the failure of Ugaki and his allies to fund Noguchi massively during 1931 and 1932, a subsidiary reason was undoubtedly the instability of the Bank of Korea. The bank had suffered a blow in the financial panic of 1920, and from that time until 1931 its position was insecure, with dividends reduced from the customary ten per cent to the four per cent level in the years 1927 to 1931[100] (Table LII). In the first half of 1925, the bank had even suffered a net loss of 36 million yen.[101] The bank, wishing to be certain of the return of its investment, probably waited for a substantial rise in the price of ammonium sulphate, which occurred at the end of 1932, before extending any considerable funding. The scale of the loan, made in 1933, was very large in proportion to the total amount currently on loan by the bank—40 million yen as compared to a total of only 120 million yen on loan in that year.[102]

The formal transferral of the hydro-electric rights on the Changjin Kang to Noguchi marks both his emergence and the eclipse of Great Zaibatsu power, not only in the Korean Peninsula but in Japan proper. The transfer of the rights indicated that the Great Zaibatsu could no longer retaliate against an attack in Korea by reprisals in the homeland.

TABLE LII

THE POSITION OF THE BANK OF KOREA 1915-1931

Year	Paid-up capital	Bank bonds issued	Deposits	Debts	Loans	Net profit for last half of year	Dividend rate (%)
1915	10,000	34,388	18,589	5,348	37,149	543	10.0
1919	40,000	163,600	189,152	97,175	322,954	2,876	9.0
1923	50,000	110,233	163,149	189,947	326,932	1,675	6.8
1925	25,000	120,541	132,737	193,660	279,588	709	2.5
1927	25,000	124,527	150,510	129,644	262,983	873	4.0
1929	25,000	118,702	103,948	217,746	269,204	1,143	4.0
1931	25,000	100,910	111,463	206,491	296,779	1,125	4.0

NOTE: All figures in thousands of yen.

It also clearly demonstrated the magnitude of the change in the power relationship of the two companies which had occurred between 1925 and 1933. In June 1925, the Government-General, arbitrating in the dispute between Mitsubishi and Noguchi, had awarded the Great Zaibatsu the superior prize of the Changjin Kang hydro-electric rights, although the giant combine's claim to priority of application was extremely dubious. In April 1933, Mitsubishi, under pressure from the colonial government, returned the hydro-electric rights to the Government-General, which promptly reissued them to KNF. Mitsubishi had already made a fixed capital investment of 1,200,000 yen in the Changjin Kang valley, and the Government-General requested Noguchi to repay Mitsubishi half of this sum. However, Noguchi offered and Mitsubishi quietly accepted a mere 400,000 yen.[103]

Once Noguchi had obtained the hydro-electric rights on the Changjin Kang he proceeded rapidly, setting up Changjin Kang Hydro-electric in May 1933 and commencing preparatory construction work in the same month. Work started on the Number One Power Station in September 1933, and the first electricity was transmitted to Hamhung as early as October 1935.[104]

By the end of 1935, Noguchi had a firmly established low-cost power base and a large-scale modern manufacturing plant. He now proceeded to lead his Korean enterprise in an explosive expansion which was to make it the fifth largest combine in Japan and a close rival to the mighty Sumitomo by 1939 [105] (Table LIII).

TABLE LIII

THE EIGHT LEADING COMBINES IN 1939

Combine	Estimated worth*	Total paid-up capital*	% of total estimated worth of all eight combines
Mitsui	1,857	1,428	24.5
Mitsubishi	1,745	1,291	23.0
Mangyō	1,712	1,249	22.6
Sumitomo	624	442	8.2
Nitchitsu (JNF)	557	474	7.3
Yasuda	484	484	6.4
Mori Combine (Shōwa Fertilizers)	330	275	4.4
Asano	270	270	3.6

*All figures in millions of yen

VIII. A PRE-EMPTIVE ATTACK?

In our discussion of the motivation of the Great Zaibatsu in the FBA, we have noted the material gains which they stood to make and the possibility that they were suddenly pressured by certain Western governments. There is yet a further possible motive. The Great Zaibatsu may have suddenly realized the threat of the Ugaki-centred forces and moved against the supposedly vulnerable Noguchi.

The very abruptness of the change in Great Zaibatsu policy strongly suggests the sudden appearance of a new factor in their calculations, and this may well have been the Ugaki Plot. While it is doubtful that a definite plan for the strike in March had been made as early as December 1930, the alliance of forces which was to carry out the plot was almost certainly already in existence. As the reaction to the FBA was to show, Noguchi had already allied with the Government-General of Korea. Hashimoto Kingorō had formed the Sakurakai in September 1930,[106] and almost undoubtedly would have allied with Ugaki by the December of that year.

There was intelligence of an Army rising at the time of the FBA. Towards the end of 1930, the Tokyo Special Police were concerned over the possibility of a revolt by "middle-ranking Army officers."[107] These were probably members of the Sakurakai. It may well have been that the intelligence staff of the Great Zaibatsu also picked up these reports of a rising and, on investigation in depth, discovered the Ugaki-centred alliance. Mitsui and Mitsubishi may then have decided to attack

Noguchi's vulnerable Korean enterprise through the FBA, as they thought it would come to form a financial pillar of the rebellious forces.

The attack on Mori calls for comment. While there is nothing to suggest that Mori was involved in the Ugaki Plot, the Great Zaibatsu may well have reasoned that Mori, too, was a potential supporter of the rebellious military, and thus moved against Shōwa Fertilizers.

If, in fact, the principal Great Zaibatsu motive for participation in the FBA was to attack the Ugaki-centred forces, then the agreement was the first clear manifestation of the ferocious struggle between establishment and rebellious elements, which was to explode into flame in the following year.

EMERGENCE

FOOTNOTES

[1]L. F. Haber, The Chemical Industry 1900-1930 (Oxford: Clarendon Press, 1971), pp. 250-278.

[2]Ibid., pp. 280-284.

[3]Ibid., pp. 284-287, 290.

[4]Ibid., pp. 285, 287.

[5]Ibid., pp. 202-203.

[6]Ibid., pp. 292-294.

[7]Ibid. and p. 356.

[8]Ibid., pp. 188-192; and W. J. Reader, The Forerunners 1870-1926 (Vol. I of Imperial Chemical Industries: A History. London: Oxford University Press, 1970), pp. 178, 351.

[9]Ibid., p. 351.

[10]Ibid., p. 352.

[11]Ibid., p. 353.

[12]Ibid., and pp. 357-358.

[13]Ibid., pp. 354-355.

[14]Ibid., p. 356.

[15]Ibid., pp. 356-357.

[16]Ibid.

[17]Nihon Ryūan Kōgyō Kyōkai, Nihon Ryūan Kōgyō Shi (Tokyo: Nihon Ryūan Kōgyō Kyōkai, 1968), pp. 98-99

[18]Ibid., pp. 99, 103.

[19]Haber, op.cit., p. 292.

[20]Nihon Ryūan Kōgyō Kyōkai, op. cit., p. 94.

[21]Ibid., Table 2-13.

[22]Ibid., p. 100.

[23]Ibid., p. 101.

[24]Nishida Gorō, "Daizaibatsu no Hōkō Tenkan," Chūōkōron, October, 1933, p. 257.

[25]Nihon Ryūan Kōgyō Kyōkai, op. cit., pp. 100-101.

[26]Ibid., p. 101.

[27]Ibid., p. 89; and Satō Kanji, Hiryō Mondai Kenkyū (Tokyo: Nihon Hyōronsha, 1930), pp. 121-122.

[28]Ibid., p. 122.

[29]Ibid., pp. 123-124.

[30]Ibid., pp. 125-126.

[31]Ibid., p. 126.

[32]Nihon Ryūan Kōgyō Kyōkai, op. cit., Table 2-8, p. 90.

[33]Years 1927-1929 based on Satō, op. cit., Appendix, pp. 3-7;
Year 1930 based on Nihon Ryūan Kogyo Kyokai, op. cit., p. 90; and
Years 1931-1935 based on Kawasaki Ichirō, Hiryō Mondai no Kaiko (Tokyo: Hiryō Mondai no Kaiko Kenkyūkai, 1951), graph in end papers.

[34]Nihon Ryūan Kōgyō Kyōkai, op. cit., p. 104; and Satō, op. cit. p. 129.

[35]Haber, op. cit., p. 276.

[36]Satō, op. cit., pp. 305-306.

[37]Nihon Ryūan Kōgyō Kyōkai, loc. cit.

[38]Ibid.

[39]Higashiura Shōji, Nihon Sangyō Kumiai Shi (Tokyo: Kōyō Shoin, 1935), p. 258.

[40]Satō, op. cit., p. 5; and Nihon Ryūan Kōgyō Kyōkai, op. cit., p. 75.

[41]Higashiura, op. cit., passim.

[42]Ibid., pp. 167, 169-170.

[43]Ibid., p. 171.

[44]Ibid., pp. 187-190.

[45]Ibid., p. 236.

[46]Nihon Ryūan Kōgyō Kyōkai, op. cit., p. 72.

[47]Ibid., pp. 79-90.

[48]Ibid., p. 84.

[49]Ibid., p. 105.

[50]Tōkyō Asahi Shimbun, Day Edition, December 23, 1930, p. 4.

[51]See for example: Futagami Shunkichi, "Chisso Kyogikai to Fujihara: Bosshu Kyōtei" and Imai Tominosuke, "Ryūan Yunyū Jidai," Ikite Iru Hiryō Shi, ed. Saitō Tokuji (Tokyo, 1952).

[52]Futagami, op. cit., p. 91.

[53]Nihon Ryūan Kōgyō Kyōkai, op. cit., Table II-16, p. 136; and Tōkyō Kōgyō Shikken Jo, Tōkyō Kōgyō Shikken Jo Goju Nen Shi (Tokyo: Tōkyō Kōgyō Shikken Jo, 1951), pp. 226-227.

[54]Fukumoto Kunio (ed.), Noguchi Jun wa Ikite Iru (Tokyo: Fuji International Consultants, 1964), p. 65; and Kamoi Hisashi, Noguchi Jun: Ningen to Jigyō (Tokyo: Tōkōsha, 1943), pp. 209-210.

[55]This is calculated as follows: Production for the entire Nitchitsu Combine, which included Korean Nitrogenous Fertilizers, was 218,718 tons and production of Japan Nitrogenous Fertilizers itself was 113,300 tons. Thus by subtraction, production at Korean Nitrogenous Fertilizers was 105,418 tons; Nihon Chisso Hiryō K.K. Bunshoka, Nihon Chisso Hiryō Jigyō Taikan (Osaka: Nihon Chisso Hiryō K.K., 1937), p. 596; and Kabushiki Nenkan 1933 (Osaka: Ōsaka-ya Shoten Chōsa-bu), p. 267.

[56]Nihon Ryūan Kōgyō Kyōkai, loc. cit.

[57]"Tōyō Tōatsu Kōgyō K.K.: Ōmuta Kōgyōsho Shi (unpublished manuscript, 1938), pp. 83-87.

[58]Yoshihashi Takehiko, Conspiracy at Mukden: The Rise of the Japanese Military (New Haven: Yale University Press, 1963), p. 61.

[59]Ibid., p. 64.

[60]Shibamura Yōgo, "Sangyō Shihongata Kigyō no Seiritsu: Shōwa Hiryō no Sōsetsu to Hatten. Ge," Kagaku Keizai, July, 1966, pp. 110-111.

[61]Ibid., p. 111.

[62]Ibid., p. 112.

[63]Kabushiki Nenkan 1928 (Osaka: Ōsaka-ya Shoten Chōsa-bu), p. 273; and Ginkō Kaisha Nenkan 1928 (Tokyo: Daiyamondo), pp. 220-221.

[64]Katagiri Ryūkichi, Hantō no Jigyō Ō: Noguchi Jun (Tokyo: Tōkai, 1939), p. 65.

[65]Tōyō Tōatsu Kōgyō, op. cit., pp. 86-88.

[66]Satō Kanji, Saikin Hiryō Mondai (Tokyo: Nihon Hyōronsha, 1938), pp. 92-94.

[67]John G. Roberts, Mitsui: Three Centuries of Japanese Business (New York: Weatherhill, 1973), p. 288.

[68]Nihon Kōgyō Ginkō, Nihon Gaiseki Shōshi (Tokyo: Nihon Kōgyō Ginkō, 1948), p. 91; and Horie Hozō, Gaishi Yūnyū no Kaiko to Tenbō (Tokyo: Yūhikaku, 1950), p. 172.

[69]Nihon Kōgyō Ginkō Rinji Shiryōshitsu, Nihon Kōgyō Ginkō Gojū Nen Shi (Tokyo: Nihon Kōgyō Ginkō, 1957), Table 69, p. 254.

[70]Mishima Yasuo, "Mitsubishi Shōji: Zaibatsugata Shōsha no Keisei," Keiei Shigaku, 8:22 et seqq., August, 1973.

[71]Shibamura, op. cit., pp. 112-113.

[72]Ibid., p. 113.

[73]Satō, op. cit., p. 119.

[74]Ibid., pp. 119-120.

[75]Ibid., pp. 201-202.

[76]Nihon Chisso Hiryō, op. cit., p. 318.

[77]Fukumoto, loc. cit.; and Kamoi, loc. cit.

[78]Katagiri, op. cit., p. 71.

[79]Nihon Chisso Hiryō, op. cit., p. 470; and Kamoi, op. cit., pp. 207-208.

[80]Katagiri, op. cit., p. 72.

[81]Ibid., pp. 73-74.

[82]Takahashi Kamekichi and Aoyama Jirō (eds.), Nihon Zaibatsu Ron (Vol. I of Nihon Kontsuerun Zensho. Tokyo: Shunjūsha, 1938), pp. 251-265; Honiden Yoshio, "Seishi Tōsei o Chūshin to Shite Zaibatsu ni Susumu," Chūōkōron, December, 1934, p. 58; and Nishida, op. cit., p. 255.

[83]George Akita, "The Other Itō: A Political Failure," Personality in Japanese History, editors Albert M. Craig and Donald H. Shively (Berkeley: University of California Press, 1970), p. 337.

[84]Ishida Bunshirō (ed.), Meiji Taishō Shōwa: Dai Jiken Shi (Tokyo: Kinshōsha, 1964), p. 1480.

[85]Higashiura, op. cit., p. 261.

[86]Nihon Ryūan Kōgyō Kyōkai, op. cit., pp. 86-87.

[87]Ibid., p. 87.

[88]Ibid.; and Higashiura, op. cit., pp. 278-279.

[89]Shibamura, op. cit., p. 112.

[90]Ibid.

[91]Yoshihashi, op. cit., p. 84.

[92]Ibid., pp. 93-95.

[93]Katagiri, op. cit., pp. 79-83.

[94]Ibid., pp. 79-81, 97-98.

[95]Ibid., p. 75.

[96]Nishida, op. cit., p. 258.

[97]Ibid., p. 259.

[98]Katagiri, op. cit., pp. 79, 86.

[99]Kamoi, op. cit., p. 211; and Katagiri, op. cit., p. 98.

[100]Watanabe Sahei and Kitahara Michitsura (eds.), Ginkō (Vol. XXVI of Gendai Nihon Sangyō Hattatsu Shi. Tokyo: Tōkōryō, 1966), Table II-132, p. 335.

[101]Ibid., p. 337.

[102]Katagiri, loc. cit.

[103]Ibid., pp. 102-106.

[104]Kamoi, op. cit., pp. 211-212.

[105]Japan Manchukuo Year Book (Tokyo: Japan Manchukuo Year Book Company, 1940), p. 1140.

[106]Kobayashi Yoshiaki, Nihon no Zaibatsu no Seisaku (Tokyo: Chigura Shobō, 1970), p. 130.

[107]Ibid., p. 131.

CHAPTER XI

CONCLUSIONS

I. INTRODUCTION

These conclusions fall into several divisions. Section II summarizes the bold dynamism of the rising companies, which is in striking contrast to the timid and ultra-cautious investment activity of established capital described in Section III. In these two sections, the motivations of the managements of the established firms and rising companies are further discussed. Section IV summarizes the conflict of established capital and the rising companies, and places this in perspective within the context of modern Japanese history. Sections II to IV thus cover the two main themes.

The remaining sections treat our minor themes. Section V, "Ambition," deals with two closely related topics. These are the enormously enthusiastic response of the technicians to opportunity and the great oversupply of technicians, both indicating a very high level of ambition amongst a considerable number of Japanese. In the demonstration of both the aggression of the rising companies and the lethargy of established capital, considerable evidence was presented which shows the dynamism of the technicians. This scattered evidence is summarized and the oversupply of technicians further noted. The ambition of the technicians and would-be members of the technical class is significant on three counts. First, it implies the desire of many Japanese to improve themselves and their

position in society; in so doing they caused economic growth. Second, the frustrated ambitions of many of this class point up the general distress of the middle class as a whole in the twenties. Third, the plight of the middle class suggests that it may well have played a revolutionary role in the early thirties. In Section VI, the case histories of technology transfer presented in the body of the thesis are summarized and some generalizations made. The possible applications of the findings to development economics are discussed. Sections V and VI are based on concrete evidence from which some fairly definite conclusions can be drawn. Section VII deals with the less tangible matter of the philosophy of business in the period. The theories of Ranis and Marshall are criticized in the light of the activity of the companies studied. In a separate part of the same section, the extreme ferocity of intercompany conflict in Japan during our period is noted. Section VIII contains a brief speculation as to the origins of the deflationary policies of the twenties.

II. THE THREE RISING COMPANIES

The three companies were essentially similar in that each was the creation of a dominant individual intent on the building of a personal business empire. In each, this individual's authority was absolute, and his initiative was the mainspring of advance. In the Suzuki Shōten, from the 1890's to the firm's bankruptcy in 1927, the final decision was always Kaneko's. In trade and, at least at times, in the establishment of new industrial ventures, he was not only the

prime mover, but also played an important managerial role. In Japan Nitrogenous Fertilizers, Noguchi was equally dominant. While Noguchi was at first dependent for finance on Mitsubishi, it was he who founded the combine by obtaining the initial technology for Soki Electric. After the firm became independent of Mitsubishi, he initiated the adoption of ammonia synthesis and rayon technology in the early twenties, and late in the decade was the prime mover in the expansion into North Korea. In the formation of the forerunner of the Mori Combine, Shōwa Fertilizers, Mori's role was of overwhelming importance. It was he who brought the firm into existence. He determined to press ahead with the construction of the Kawasaki Plant on a shoe-string budget, and chose the technology and the technicians.

Kaneko, Noguchi and Mori were clearly all major entrepreneurs. There were others of comparable stature; Nakano Yūrei and Ayukawa Gisuke, to name only two, were in the same class. Many developing countries have suffered and continue to suffer from a poverty of entrepreneurial genius. Brazil, for example, has never produced a major entrepreneur. How was it that Japan was so rich in entrepreneurial talent?

While we cannot offer any definite conclusion as to the origin of the creative drive of our three entrepreneurs, we can eliminate a number of possible factors and offer a speculative answer. The origin of their work drive cannot have been related to a particular social class, region, generation, employment history, or type of education.

Their backgrounds were disparate. The only thing common to all appears to be a particularly strong attachment to the mother. It is possible that their creative activity originated as repayment of a moral debt to the mother. The explanation for Japan's wealth of entrepreneurial genius may lie in the stress placed by Japanese society on the repayment of obligations to parents.

As extensions of their dominant entrepreneurs, the rising companies exhibited a bold determined expansionist spirit, which at times bordered on fanaticism.

Suzuki expanded continually. In the rather unfavourable business climate of the late Meiji when most enterprises displayed considerable caution, the firm diversified vigorously into many branches of industry related to its trading activities, and boldly expanded into the risky and little-known sphere of world trade. Suzuki exploited the opportunity of the World War I boom as did no other Japanese company; it grew from a small combine in 1914 to rival Sumitomo in size by 1919. It moved into numerous industries, but it was in trade that its progress was the most striking. Suzuki outstripped Mitsui to become Japan's greatest trading enterprise. Suzuki's success can only be attributed to Kaneko's intelligence, courage and managerial drive. Early in World War I, at a time when nearly all in Japan predicted a slump of unprecedented intensity, Kaneko interpreting political and commercial information obtained by his global intelligence net, forecast a great boom. Though considered mad by many contemporaries, he strained the resources

of Suzuki to buy critical commodities at the low prices prevailing. He was vindicated completely, as Suzuki made fabulous profits which were reinvested to start the explosive wartime expansion of the firm.

Following the Mitsui attack on Suzuki in 1918, although it was obvious that the giant combine would strike at the Kobe firm again were it to resume rapid growth, Kaneko remained undaunted. While the post-World War I slump and the firm's readjustment to the peace economy checked Suzuki's progress for two years, under Kaneko's forceful guidance, it again expanded rapidly in the early twenties at a rate probably greater than any other Japanese firm. It took full advantage of the great opportunity that existed in the twenties in ammonia synthesis and rayon. Suzuki was a pioneer in these industries. The establishment of the viscose rayon plant at Hiroshima in the early twenties,without foreign tutelage and far ahead of competitors, well illustrates the bold spirit of the combine. Suzuki's failure to expand in the years between 1924 and 1926 was not due to a lack of courage or will. Harassed by poor trading conditions and the poor profitability of all but the most successful subsidiaries, the combine was forced to abandon growth policies.

Suzuki's expansion advanced the firm from a tiny Kobe trader to the third largest combine in Japan within a quarter of a century. This progress was entirely without parallel in Japan and finds few equals in world commercial history.

While both Noguchi and Mori were engaged to a minor extent in other fields, the main thrust of their activity in the twenties and

early thirties was the exploitation of the great opportunity in ammonia synthesis.

While the growth of Noguchi's Japan Nitrogenous Fertilizers in our period did not match the long-maintained explosive growth rates of the Suzuki Shōten, its achievements, by any normal standard of comparison, were extraordinary. As with Suzuki, the keynote of the firm's history was bold expansion to the widest possible limits. Taking the fullest advantage of the World War I boom, Noguchi forcefully expanded his firm from a tiny carbide producer in 1906 to a diversified chemical manufacturer on some scale by 1918. He boldly imported two new chemical technologies in the decade prior to the war.

In the twenties, Noguchi displayed an even higher level of courage and dynamism. In 1923, at considerable risk, he imported and successfully industrialized the Casale Process for ammonia synthesis, then untried on an industrial scale. Once the initial plant had proved a technological success, Japan Nitrogenous Fertilizers expanded its ammonia synthesis capacity dramatically. It was in the establishment of the vast new plant at Hamhung in the north of Korea, however, that Noguchi displayed his full stature as an entrepreneur. To the astonishment of the Japanese industrial world and the amazement and alarm of the Western nitrogen industry, Japan Nitrogenous Fertilizers established an ammonia synthesis plant with a capacity sufficient to supply Korea itself and to displace all foreign ammonium sulphate imports from the Japanese market. In the face of savage foreign dumping and the opposition of the Great Zaibatsu, Noguchi successfully

established the huge Korean plant, which became the base of a gigantic chemical complex unparallelled in the Orient. Even Suzuki had not moved so far at one leap.

Though much of Mori's dynamic career lies outside our period, we have adduced considerable evidence of his bold, energetic spirit. From his earliest days, he strove resolutely to createa major business enterprise. Though his iodine manufacturing business was bankrupted after World War I, he turned undeterred to the growing electricity and electro-chemical industries, where he achieved considerable success in the early twenties as the most active director of a large electricity generating firm. In the early thirties, Mori sought, at one bold stroke, to establish himself as a major entrepreneur. The founding of the Kawasaki ammonia synthesis plant was perhaps the most daring single act in the history of Japanese industrial enterprise. There were high risks in both finance and technology. Mori, who chose to remain independent of Mitsui, pressed ahead with only a small fraction of the funding necessary to build the plant, and covered its cost largely by equipment manufacturers' credit. The cost was drastically reduced by use of a Japanese-developed variant of the Haber Process. This not only saved the considerable expense of a patent licence, but obviated the purchase of high-priced foreign equipment. At that time, as the prestige of Japanese technology was low, industrial circles were highly sceptical of the venture, and it was in an atmosphere of hostility and derision that Mori brought the plant into production.

While the three rising companies were strikingly similar in fundamental form and spirit of enterprise, there were considerable differences in the circumstances of their development and mode of operation. While each of the three firms had notable individual characteristics, Suzuki stood apart from the other two. In contrast to Japan Nitrogenous Fertilizers and Shōwa Fertilizers, it was trade-based, highly diversified and very large.

Unlike the other two firms, the fundamental element in Suzuki was the trading company. This emphasis on trade was a product of two factors. Firstly, while Kaneko had no mean record in industrial promotion, he was a genius at trade. As an industrialist Kaneko had, at least, equals; as a trader he was without peer. Secondly, Suzuki's initial rise was at a period when Japan's technological development was so limited that the establishment of a large combine centred on manufacturing would have been very difficult.

From the earliest days of Kaneko's leadership, Suzuki diversified steadily. Even during the 1910's, Kaneko had a definite industrial strategy. He foresaw the rise of diesel propulsion, artificial fertilizers and fabrics, and successfully established manufacturing enterprises in these fields. Suzuki's leader did not, however, attempt to build an integrated complex like that of Mitsubishi or Kawasaki in engineering, or Sumitomo in metallurgy. Probably foreseeing the limitation of demand in any one sector, he decided on limited participation in a number of sectors. By the early twenties, Suzuki was as diversified as Mitsui, with considerable interests in such

widely disparate fields as hydro-electricity, railways, iron and steel, shipbuilding, general engineering, heavy chemicals, textiles, food-stuffs, tobacco, warehousing and insurance. While the Suzuki Combine did not include a major bank, the firm's extremely close association with the very large, semi-official Bank of Taiwan made the development of a large banking arm unnecessary.

In the twenties, Suzuki was much larger than either the enterprise of Noguchi or Mori. At the time of the firm's bankruptcy in 1927, it was Japan's third-ranking combine, controlling enterprises with an aggregate paid-up capital of nearly 400 million yen. It was, of course, even more economically powerful than the size of the combine alone would suggest, due to its close connection with the Bank of Taiwan.

The enterprises of Noguchi and Mori were highly concentrated in the chemical industry and did not even approach minor zaibatsu size until the end of the twenties, when both entrepreneurs made a dramatic move to seize large shares of the ammonium sulphate market. The histories of the two firms prior to 1930 were very different.

Japan Nitrogenous Fertilizers was a product of steady evolution. The company's growth was due to the successful industrialization of five foreign processes: the Frank and Caro calcium cyanamide process in 1908, the transformed ammonia process in 1913, the Casale ammonia synthesis process in 1923, a viscose rayon process in the same year, and the Bemburg rayon process in 1928. Just as Suzuki owed its rise to Kaneko's trading genius, so too did Japan

Nitrogenous Fertilizers depend on Noguchi's technical judgement. From the time of the founding of Soki Electric and certainly until the early thirties or possibly later, Noguchi was without peer in the importation of chemical technology. Noguchi's technical skill is well shown by his selection of the Casale Process over the less expensive, but more technologically difficult, Claude Process in the early twenties.

Until the founding of the giant Kawasaki Plant of Shōwa Fertilizers in 1930, Mori's activities had been small in scale and conventional in concept. He was nothing of a trader and, unlike Noguchi, possessed only a rudimentary knowledge of chemical engineering. Mori's forte was his courage and energy as an initiator and his skill in industrial organization. His base in the twenties had been in hydro-electric power generation, and electricity was central to Mori's initial move into the chemical industry at Kawasaki and to his later advance into aluminum.

III. THE ESTABLISHED FIRMS

The Great Zaibatsu

The Great Zaibatsu had expanded aggressively in the early Meiji, but in the period 1905 to 1931, although their financial sectors still grew quickly, they were sluggish and timid in the import of new technology, and even in the older industrial staples their growth rates were rather low.

In the period between the Sino-Japanese War and World War I the Great Zaibatsu avoided risks, showing little interest in any of

the new areas which were technologically difficult or required long-term investment. They virtually ignored railways, electricity generation and city gas. Mitsui invested, though tardily and timidly, in iron and steel manufacture and the chemical industry, but Mitsubishi did not show any direct interest in these fields.

In the exceptionally favourable conditions of World War I, both Great Zaibatsu developed some of the newer industries, but in the twenties they invested relatively little in new industrial fields. Mitsui was inactive in almost all the new, mechanical engineering fields, though continuing to invest in iron and steel. Mitsubishi, though active in the newer engineering industries, by no means took full advantage of its commanding position. The combine neither established an automobile production arm nor entered the steel industry, and seems to have persisted in aircraft manufacture only because of a governmental guarantee of profits.

Great Zaibatsu sluggishness is most clearly apparent in the chemical industry, especially in their approach to the great opportunities in rayon and ammonia synthesis. Apart from its association with Asahi Glass, Mitsubishi showed no interest in the chemical industry as a whole until 1934, when the combine established Japan Tar Industries. Mitsui, it is true, did establish enterprises in rayon and ammonia synthesis during the twenties, but its moves were both belated in time and timid in scale.

Mitsui entered the rayon industry with the founding of Oriental Rayon, well after the pioneering enterprises were firmly established.

Considering the immense resources of the zaibatsu, the proven success of the two pioneers, and the excellence of Courtaulds' technology which was transferred by tutelage of the most direct and comprehensive type, the initial plant was extremely small. Prior to World War II, Oriental Rayon continued to lag well behind the two pioneers, and never overcame the disadvantages of its timid start.

Mitsui showed even greater caution in ammonia synthesis than it had in rayon. Immediately after World War I, as a member of the Oriental Nitrogen Union, the giant combine investigated ammonia synthesis technology. By 1920, however, the union had lost interest in the process, probably because of the high risks involved in this new and technologically difficult field. The hesitant Mitsui did not enter the field of ammonia synthesis until 1928, fully five years after Noguchi's successful pioneering venture, with the cautious take-over of the small but technologically proven operation of Number One Nitrogen. The new Mitsui plant at Miike, which came on stream in 1931, was tiny in comparison with the contemporary ventures of Mori and Noguchi.

One would have expected that the two largest enterprises in a young industrial power like Japan in the twenties would have stressed rapid growth in the new industries, but as we have seen they did not. Why were the Great Zaibatsu so sluggish? They had a profit incentive to invest in the new industries. Their trading profits did not increase during the twenties, and profits from coal mining, metal mining, and especially shipbuilding were lower than in the previous

decade. Increased revenue produced by the finance-related ventures of the Great Zaibatsu, though real, was only small. Yet these great combines were unaggressive in new industrial ventures.

Why was the Great Zaibatsu leadership so little interested in the new, technologically intensive industries? There appear to have been a number of factors. The leaders were probably little interested in profit as such, but were primarily concerned with the maintenance of their hegemony. They believed that, by the suppression of rivals, they could hold their position at the pinnacle of the economic hierarchy, rendering rapid growth unnecessary. Great Zaibatsu interest in swift technological modernization was also greatly diminished by their concept of Japan's relation to the West. They saw themselves, to a degree, as the elite of a quasi-colony rather than as the economic and technological defenders of the nation, while at the same time they feared to antagonize the West by challenging its international hegemony. A third factor was a lack of confidence in Japanese technology, founded both in hard past experience and a general sense of inferiority to the West.

There is no direct evidence to prove that the Great Zaibatsu leaders gave high priority to the maintenance of their hegemony, but it seems very probable that they did so. By the end of World War I, the two great combines occupied a dominant position in the economy. Business leaders of any culture would have wished to safeguard the status of their enterprises, but for the Great Zaibatsu managements, the product of a highly hierarchical and status-conscious society, it must have

seemed doubly important. So great was the discrepancy in economic power and political influence between their enterprises and those of even their largest rivals, that they must have expected to hold their position by commercial and political pressure alone. Even the mighty Suzuki was laid low by a skilfull political manoeuvre.

Although there is little direct evidence, it is probable that the managements of Mitsui and Mitsubishi regarded themselves, at least in part, as the elite of a cultural quasi-colony of the West.

There are relatively few biographies of the Great Zaibatsu leaders of the twenties, and those works that do exist are singularly uninformative. Attitudes to the West do not receive exceptional treatment in these volumes, and for indications of the orientation of the leadership one must look to indirect evidence. We have already noted that two top-rank politicians, who were sons-in-law of Iwasaki Yatarō, the founder of Mitsubishi, were not merely fervent Anglophiles, but were also, in part, culturally English. Some leaders, notably Ikeda Seihin of Mitsui, travelled frequently in the West, and had a number of friends there. Striking evidence of the orientation of the leadership is also to be found in the architecture of many of the principal company buildings. Among Mitsui's best-known buildings were the pseudo-Tudor Minato Club at Ōmuta in Kyushu, the Victorian-style Tsunamachi Club in Tokyo designed by a British architect, and the new main office erected after the Great Tokyo Earthquake, modelled exactly on a pre-existing building in New York. Amongst the major zaibatsu leaders, too, house furnishings were often in the style of the English

nobility, perhaps with a touch of Empire—an elephant's foot stool or a lion's head ornament.

It can scarcely be doubted that the Great Zaibatsu leadership, in common with the vast majority of their contemporaries, lacked confidence in Japanese technology. The leaders of the Great Zaibatsu were likely to have felt the national sense of inferiority toward the West during the twenties much more keenly than the vast majority of their countrymen. Many of them had spent much of the most impressionable part of their lives in the West, at a period when there was a huge gulf in nearly all fields between Japan and the Occident. In no area was the gulf wider than in technology. Difficulties experienced in the importation of new, complex, chemical technology must also have strongly coloured the attitude of management. Both Dan Takuma and Makita Tamaki, for example, had suffered in past attempts to import new chemical technology.

We have noted the sluggishness of the Great Zaibatsu in the new, technologically intensive industries during the twenties at some length, and accounted for it by a variety of factors which were internal to the combines. It is possible, though this can only be discussed speculatively, that there were powerful external constraints on their behaviour.

The experience of World War I had impressed the vital, strategic importance of the chemical industry on the governments of the Western countries and especially on that of the U.K. There can be no doubt that, by the early twenties, the Western powers were alarmed by the new-found strength of Japan, and moved to contain her by the Washington Treaties of 1922. World War I had greatly increased both Japan's capacity to

invade former Western export preserves for manufactures and to support a powerful war machine. It is therefore possible that certain Western powers also attempted to contain Japan economically and technologically in the twenties.

In the economic and technological containment of Japan, the most crucial sector would undoubtedly have been ammonia synthesis. The ammonia synthesis industry was significant not because it offered Japan a cheap supply of explosives and ammonium sulphate fertilizer (this was of relatively minor importance), but because it was the threshold to much of the modern chemical industry as a whole. It is thus possible that the Western powers pressured the Great Zaibatsu throughout the twenties, and that the Oriental Nitrogen Union abandoned its interest in ammonia synthesis in 1920 because of Western threats rather than high investment risks. It is also possible that this pressure was at least partly instrumental to the Great Zaibatsu volte-face of December 1930.

The Textile Companies

During the tens and twenties, of all industrial groups in Japan, the cotton spinning firms were by far the best-placed to pioneer the introduction of rayon technology. They did not, however, play such a role. While Suzuki, the pioneer, planned a full-scale rayon plant as early as 1918 and Noguchi was committed to rayon by 1922, no textile company moved to establish a plant until 1926.

Why were the spinning companies so sluggish in entering rayon where they held so many competitive advantages? It was not due to external or internal constraints. These firms were independent of other companies, they were of considerable size, and possessed financial resources far in excess of those necessary to finance the development of even the largest scale rayon plant. The reasons can only have lain in managerial attitudes.

The motivation of the leadership cannot have been simply the same as that of the management of the Great Zaibatsu, as the relation of the textile firms to the rayon industry and to the politico-economic establishment was very different. Rayon represented only one of several possible lines of advance for the Great Zaibatsu, but for the textile firms it was the only practicable option for diversification in the twenties. The rise of nationalism in China greatly hindered further development in that country, while during the decade competition in textiles other than cotton and rayon was severe. Why then was the leadership of the spinning firms so uninterested in rayon?

Although their disinterest probably sprang in part from the general scepticism concerning Japanese technology, there were almost certainly other reasons. Unlike the Great Zaibatsu management, the leadership of the spinning firms cannot have argued that their position was impregnable in the twenties. Their financial strength was great, but they were very far from a dominant position in the economy. They cannot have reasoned, as Great Zaibatsu leaders appear to have done, that they could maintain their hegemony by the elimination of rivals

rather than through vigorous growth. In the twenties it was conceivable that a company strong in both cotton and rayon could emerge and use its strength in rayon to undercut prices in cotton, thus taking over much of the market of the cotton spinning firms. Why did these firms not fear this possibility?

We have argued that textile management saw the economic world of the period as one of slow change. In this stable world, the position of cotton textile firms seemed assured and aggressive diversification unnecessary. The leaders of the textile majors interpreted the near future in terms of the slow-moving Meiji past. They appear to have failed to understand that the technological front in the newer industries was advancing rapidly and that late-comers would find it difficult to overtake the early starters.

While textile capital was technologically unenterprising, it was by no means politically inactive. The financial power of the textile companies was sufficient to allow them to mount modest political opposition to the Great Zaibatsu and their political allies. Their party, the Jitsugyō Dōshikai, which appears to have been of the true Western liberal stamp, advocated laissez-faire and genuine parliamentary democracy. In the late twenties, it sought to organize an anti-zaibatsu alliance of textile capital and small business. Although the party ceased to exist in 1932, its leader, Mutō Sanji, continued political activity against the zaibatsu as controller of the newspaper Jiji, and it is possible that his murder at Kamakura Railway Station in 1934 resulted from his continuing exposures of Great Zaibatsu political

manoeuvres. English language sources have made only the briefest mention of the Jitsugyō Dōshikai,[1] though it is of great interest as an anti-Establishment force. Investigation of the links of the party and of its leader might tell us much, not only about the opposition to the Establishment, but also about the Establishment itself.

IV. CONFLICT

Summary

Each of the three rising companies had a distinctive history of conflict with the Establishment. Suzuki's rapid development soon threatened the pre-eminence of Mitsui, and the Kobe-based combine probably suffered attack by the zaibatsu on the two occasions when it was most vulnerable.

Mitsui appears to have seized the opportunity presented by the fortuitous occurrence of the Rice Riots in 1918 to engineer attacks on major Suzuki installations in Kobe. In this attempt to damage Suzuki, the giant combine's objectives were probably political as well as commercial, aiming not just to cripple its dangerous trade rival, but to also reduce Suzuki's capacity to finance the oligarchy.

There are good reasons to believe that Mitsui instigated the attack on Suzuki. Mitsui was the owner of the Ōsaka Asahi, and the final ascendancy of the socialists on the editorial staff immediately prior to the smear campaign is unlikely to have been fortuitous. The very high priority given by the mobs, led by the Mitsui-backed Seiyūkai, to attacks on Suzuki installations, strongly suggests a Mitsui

voice in the planning of these attacks. Other than in Kobe the Rice Riots occurred spontaneously, and there seems to have been no selective attack on supporters of the oligarchy. Only in Kobe, the nerve centre of Mitsui's dreaded rival, do the riots seem to have been deliberately directed.

We have argued that the Bank of Taiwan Crisis of 1927, which bankrupted Suzuki, was the consequence of a Mitsui plot. It is probable that Mitsui had two objectives: firstly, to bring down the First Wakatsuki Cabinet, so that the "Soft" Diplomacy of Shidehara in China could be replaced by the harder line favoured by Mitsui; and, secondly, to bankrupt the Suzuki Shōten. The plan was simple in outline. Mitsui had become aware of the weakness of the Bank of Taiwan through the debate in the Diet on the Earthquake Bills in February, and planned to place the bank, which was of vital national importance, in jeopardy at a time when the cabinet could not offer it financial support. The government would thus be forced to resign to avoid responsibility for a major economic disaster. Mitsui forces would then take power, support the Bank of Taiwan, and at the same time sever its connection with the Suzuki Shōten which would become bankrupt.

Mitsui took full advantage of fortuitous circumstances. There was a great rise of public feeling against the Wakatsuki Cabinet, as it neither took a stand in face of the rapidly deteriorating Japanese position in China, nor effectively defended Japanese nationals from the "Chinese atrocities" perpetrated after late March. Mitsui deliberately set up a run on the Bank of Taiwan, which was so arranged that it

reached a critical pitch at the height of the public outcry over the China situation, and the government was therefore unable to recall the Diet to vote funds to support the bank. Had the cabinet attempted to recall the Diet at the height of the outcry, public opinion would have forced all but the most committed Kenseikai Dietmen to oppose the cabinet. The Great Zaibatsu was able to fix the time of the run on the bank through information supplied by its excellent intelligence service in China.

The cabinet's only other possible source of funds was to obtain an Imperial Edict, which required a majority vote in a combined session of the twelve-member cabinet and the twenty-three member Privy Council. The ultra-nationalist Privy Council, which had long opposed the Shidehara Diplomacy, seized this opportunity to bring down the Wakatsuki Cabinet by refusing to grant support funds. Mitsui's plan to bankrupt Suzuki was realized in the succeeding Seiyūkai administration.

Turning to the conflict between the two rising companies, Japan Nitrogenous Fertilizers and Shōwa Fertilizers, and the Great Zaibatsu, we will first treat the events which are reasonably certain, and then seek interpretations of the significance of these events and of the motivation of the Great Zaibatsu.

With the Fujihara-Bosch Agreement of December 1930, Mitsui and Mitsubishi moved to destroy the two emerging chemical giants, Japan Nitrogenous Fertilizers and Shōwa Fertilizers. The two firms, however, successfully resisted pressure by alliances with anti-Great Zaibatsu forces, which had been emboldened to act by the rise of revolutionary

feeling in Japan consequent upon the Great Slump. When the Great Zaibatsu moved to deny the facilities of the fertilizer network to Shōwa Fertilizers, the company was able to secure a marketing contract with the purchasing arm of the newly militant Development Cooperatives. Japan Nitrogenous Fertilizers was supported by both the Government-General of Korea, which almost certainly guaranteed critically important hydro-electric rights, and certain firms which offered immediate finance.

The overall significance of the conflict of December 1930 is plain. The Great Zaibatsu suffered their first major reverse since the beginning of their hegemony at the end of World War I, at the hands of a number of those forces which came to dominate the political world of the thirties. These forces fall into two general categories: those of the "people" and those of the "elite." Let us consider those of the "people" first.

The most potent, but by far the most intangible of these forces, was a widespread feeling of anger and rebellion, especially strong in the rural areas. At this time, the Great Zaibatsu leadership must have recollected with some irony the Rice Riots of 1918 when the oligarchy lost power, though the situation in the early thirties was much more dangerous than that of 1918. While in the Rice Riots some 700,000 people had demonstrated, and for a four-day period in August all urban areas in Japan whether large or small had suffered from continuous night rioting, the troops deployed had proved loyal. In the early thirties, the armed forces themselves were the leaders in rebellion, and were a major rising to commence there was little likelihood that

it could be quelled. The people's anger also breathed a revolutionary spirit into the formerly rather politically passive Development Cooperatives, which from 1930 became militant in the defence of the farmer.

At the time of the Fujihara-Bosch Agreement, General Ugaki Kazushige, who was then Governor-General of Korea, gave considerable support to Noguchi, as both sought the development of Korea and the industrial advance of Japan. An alliance of elite, revolutionary forces, mostly comprising elements associated with the "Control Faction" of the Army, conspired to install Ugaki, who was a prominent figure in the faction, as Prime Minister in a coup planned for March 1931 (the March Plot). The alliance almost certainly existed in December 1930, and it is very probable that it was knowledge of the plot which emboldened Noguchi to maintain his stand against Great Zaibatsu pressure. The continuing support given Noguchi by Sumitomo and the Thirty-Fourth Bank strongly indicates that they too were aware of the plot, as they would otherwise have hardly dared to confront Mitsubishi. It seems likely that all three firms were active participants in the plot and not simply informed bystanders.

Much concerning the March Plot of 1931, including the actual role of Ugaki himself, remains obscure. According to previous studies, apart from the "Control Faction" of the Army, the only principal participants in the plot were the Sakurakai and a group of civilian nationalists. This present study indicates that the March Plot may have also involved important elements of the business world.

There has been a tendency of late to discuss Japanese politics in the interwar period in terms of a separation of powers[2]—a conflict between institutional groups, which included the Army, the Navy, the parties of the Diet, and the Privy Council. While none would claim that these institutional blocks were monolithic, a number would state that their interaction constituted the essence of politics during the period. This thesis indicates that the basic dynamics of political conflict cut across institutional lines and that alliances were interinstitutional. The confrontation of 1930 to 1931 is a case in point.

During most of 1930, the Great Zaibatsu supported the Japanese ammonium sulphate producers through the Nitrogen Discussion Council. Why did they make a volte face in December? While they could very probably have concluded an agreement similar to the Fujihara-Bosch Agreement at any time during 1930, it seems that the advantages of bankrupting the two rising companies were outweighed by the disadvantage until the end of the year. The advantages were the restoration of trading profits and the takeover of Noguchi's Korean enterprise at a nominal price. The disadvantage was the odium of collaborating with foreigners in the destruction of Japanese firms. Fear of the two apparently unsupported rising companies was almost certainly not an element as it had been with Suzuki and its political allies. The suddenness of the shift in Great Zaibatsu policy certainly indicates the abrupt appearance of a new factor, which may have been the application of foreign pressure, or the realization of the existence of the March Plot. Although the great combines were not apprehensive of the unsupported rising companies,

they would have feared them in combination with the "Control Faction" and its allies.

We have examined the conflict of the rising companies with the Establishment in some detail in the perspective of the twenties. In the next section, we will view it within the context of modern Japanese history as a whole.

Overview

"Are not the new zaibatsu the New Japan writ small?"[3] wrote Katagiri in 1939 in the flush of Japan's new-found success in industry and continental expansion. He was right. The spirit of the new zaibatsu was that of the newly-awakened nation. Their resolution and fanatical ambition were fully echoed in the Japanese mood of the thirties. The nation, like these combines, was then intent on expansion to the widest limits.

The new zaibatsu were the gigantic successors in the late thirties to the rising companies of the twenties. While Suzuki, eliminated in 1927, had no true successor, Japan Nitrogenous Fertilizers had become Nitchitsu, the fifth-ranking combine in Japan, and Shōwa Fertilizers had grown to become the seventh-ranking Mori Combine. Other rising companies, too, had shown growth which was no less remarkable. The new zaibatsu were not simply the legal and physical heirs to the rising companies, but were also their spiritual descendants, fully inheriting their aggression and almost fanatical dynamism.

What was new in the thirties was not a change in the spirit of the rising companies, but a change in the spirit of the nation. The

rising companies in the twenties had been the heralds of the spiritual revolution of the thirties, and it was their spirit which became that of the nation as a whole after the beginning of the decade.

During the twenties, among certain sections of the populace at least, economic aspirations were rising, though these were, as we have seen, to a considerable degree frustrated by the deflationary policies of the government and the slow-growth strategies of established capital. In the same way, the aspirations of the rising companies were threatened by established capital, and the Suzuki Shōten ultimately destroyed.

The revolution of the early thirties freed both aspiring individual and rising company. The agony of the Great Slump threw the contrast between individual aspirations and present economic reality into starkest relief. The people wished purpose, swift economic advance and grandeur as a nation on the world stage: they were offered semi-stagnation, quasi-poverty and half colonial status. Their ambitions crystallized sharply, and with that crystallization came a new determination to see their ambitions realized. The new mood forced a revolution in government policies.

The Japanese "economic miracle" has been considered a purely post-World War II phenomenon. Yet, in the perspective afforded by this thesis, it would seem that it was not. The spirit of determined expansion which has been the motive force underpinning the miracle existed as early as World War I, though it then inspired only a few. The spirit spread slowly in the twenties, but explosively to the nation as a whole in the revolution of the early thirties.

These years should perhaps be regarded as the fundamental turning point in modern Japanese history. The unification of the country with the Meiji Restoration was certainly of great significance. The defeat in World War II and the ensuing American occupation profoundly altered the nation's polity, legal framework, economic organization and posture in foreign affairs. The revolution of the early thirties, however, represented a much more fundamental change, as it was then that the soul of the modern nation came into existence. Prior to that there had been no true national will: a somewhat lethargic and predatory establishment had been able to set policies with little regard to the general welfare. In the thirties, the opinion of the aroused nation set policy guidelines which, if only approximate, were nonetheless absolute. Of the various governments in the decade, the people demanded policies of rapid economic growth at home and expansion abroad.

The two nations which have made by far the most striking economic progress since World War II are Japan and Germany. The histories of the two countries since World War I are strikingly similar in outline. Frustration and suffering in the twenties and early thirties was followed in both by an upsurge of bellicose nationalism, accompanied by rapid economic development at home and expansion abroad. Expansion led to a clash with the established powers whose pre-existing possessions blocked the advance of the two Axis powers, and whose position in the world community was threatened by their rise. Both nations suffered defeat in war, to be followed by resurrection and rapid economic growth. There is a rather eerie parallel between the growth of the rising

companies and their conflict with the Japanese establishment in the twenties, and the rise of Japan and Germany and their conflict with the world establishment in the thirties and early forties.

V. AMBITION

In the three case histories where detailed information is available on the adoption of new technology, the Japanese technicians acted aggressively. Nearly all showed great determination and, in some individuals, this reached a fanatical intensity.

In the research which led to the establishment of Imperial Rayon, Hata was indefatigable in experimentation, and Kumura, though only intermittently energetic in the early period of the research, proved a most determined industrial spy and tireless innovator in the later phases. At the time of the foundation of the first Shiga Plant, Oriental Rayon's technicians enthusiastically assimilated Courtaulds' technology, while in the late twenties they toiled continuously to effect improvements. In the establishment of the TIES technology at the Kawasaki Plant of Shōwa Fertilizers, the leading technicians Yokoyama and Nakamura showed a fanatical commitment to their task, both toiling to the point of prostration in a hostile atmosphere to bring the plant into production.

The information which is available on Japan Nitrogenous Fertilizers is much less detailed. The assimilation of the ammonia synthesis technology appears to have proceeded smoothly at Nobeoka, while many technicians must have been trained very quickly during the mid- and late twenties to allow for the establishment of the huge plant in Korea.

This suggests a very high degree of dedication among the men of Noguchi's technical group.

In passing, we may comment on the technicians' level of skill. Here the record is more checkered, though most displayed expertise of a high order. Kumura's success as an industrial spy and as an adapter of foreign equipment, the extensive upgrading of the Shiga Plant by the staff of Oriental Rayon, the able development and industrialization of the TIES Process by the project's personnel, all spring to mind. There were, however, obvious instances of striking deficiency. Neither Hata nor Kumura admitted their inability to comprehend their foreign language texts, resulting in an enormous waste of research time and effort. Hata proved completely ineffectual as an industrial spy in the West. Noguchi's early associate, Fujiyama Joichi, squandered time, effort and materials in fruitless attempts to modify the Frank and Caro Process, because he was emotionally incapable of accepting the superiority of Western technology.

Although there was considerable unemployment amongst technicians, this cannot have been the spur which drove those men appearing in our detailed studies. The technicians who established Imperial Rayon and Shōwa Fertilizer's Kawasaki Plant were secure in their employment, as were those who took over the operation of Oriental Rayon. Only personal ambition can have been the goad. If so, some at least were well rewarded. Kumura rose to head Imperial Rayon, while Yokoyama and Nakamura later came to hold the highest offices in the successor company to Shōwa Fertilizers. As it is highly unlikely that the chemical

industry had a significantly higher percentage of well motivated individuals than Japanese industry as a whole, it is probable that there were a considerable number of highly ambitious technicians throughout industry.

We have shown that there was a superabundance of chemists and chemical technologists, at least during the first three decades of the twentieth century, and adduced evidence that a considerable oversupply of graduates was a general phenomenon applying to all subjects taught at the institutions of higher education. That so many were prepared to undergo long and arduous training with relatively little chance of reward, corroborates the high ambition of the middle and would-be middle class.

The existence of these highly motivated people indicates that some of those essential social changes which underpin economic development were well-advanced by the time of World War I. Ambition is the engine of economic advance. Interview information indicates that by the twenties chemical technologists, at least, were being drawn from all levels of Japanese society. Japan was already on the march.

When did the oversupply of technicians begin? There are no surveys in either English or Japanese evaluating the balance of supply and demand. Standard works on the history of Japanese economic development[4] ignore the matter entirely. The rate of supply of technicians and middle management personnel is simply not questioned. We can only supply the vaguest answer to the question. The appearance of a volume of literature in the early twenties on middle class unemployment and general distress indicates that oversupply had become a serious problem

by the end of the previous decade.

Was there a comparable oversupply of technical graduates in the contemporary West? It would seem that there was not. In the U.K. graduates in chemistry and chemical technology formed a relatively small fraction of the technical work force, while in Germany there does not seem to have been a serious oversupply until the late twenties.[5]

As we have noted, the relationship between the supply and demand of graduates can be used as an indicator of the difference between the possible and actual rate of economic advance. Sustained, high oversupply signifies that rapid advance is possible, as the will to effect it exists, but that this will is constrained in some way. This indicator, however, has not been used by development economists.[6]

The availability of technical manpower is a critical factor in determining the rate of a nation's economic growth. Yet it has been accorded negligible space in the contemporary literature of development economics. For example, an otherwise excellent series produced under the auspices of the Organization for Economic Co-operation and Development and covering the economies of Brazil, India, Mexico, Pakistan, Taiwan and the Philippines, accords no space to this topic.[7] The volume on Taiwan, for example, merely comments "it has been generally felt that educational policy in Taiwan could have done more to accelerate economic development," while briefly noting the Taiwanese government's long-range manpower development program.[8]

This thesis has pointed up the necessity for further research on the relation between supply and demand of technicians in pre-World War II

Japan and for such studies in the present-day developing countries.

As we have seen, the high ambition of many Japanese was frustrated. Even those successful in entering their chosen profession found life arduous and material rewards meagre, due to the pressure of so many eager applicants. Interviews show that, even in the more prosperous thirties, for engineers working in ammonia synthesis plants, hours of work were very long, pay was low, conditions dangerous and fringe benefits almost non-existent. Such hardships must have afflicted the middle class or would-be middle class as a whole. Surely this distressed middle class must have been a powerful influence in the revolution of the early thirties?

As we have noted, German history closely parallels that of Japan. While emphasis differs from author to author, many sources accord the distressed middle class an important role in the rise of the Nazi Party in Germany.[9] In the case of Japan, nothing has appeared in English treating the role of the middle class in the political changes of the thirties. The few articles in Japanese which discuss the middle class organizations,[10] conclude that they lacked significant political influence. Can this class really have played so small a part in changes that influenced its circumstances so fundamentally? Its voice was clear. Some of the cries of anger and distress of the late twenties and early thirties, especially those for the establishment of the new, technologically intensive industries, surely well up from its frustrations. Perhaps it did not exert influence directly through middle class organizations as such, but indirectly through the company and the middle

ranks of the bureaucracy. Further research is needed on the role of the middle class within these institutions.

VI. TECHNOLOGY

The conclusions to be drawn from our case histories of technology transfer fall under two general headings. Under the first the concrete historical situation in Japan is considered, while under the second the possible applications of the various methods of technology transfer are discussed.

Technology Transfer to Japan

The technology gap. The Japanese could construct and operate ammonia synthesis plants based on processes developed abroad, without foreign guidance, after the mid-twenties, but they lacked the capacity to make considerable innovations until after World War II.

Even in the early twenties, relatively few foreigners were employed in the construction and early-stage operation of ammonia synthesis plants in Japan, and towards the end of the decade plants were set up without any foreign participation whatsoever. No foreigners appear to have been employed in the foundation of the colossal Hamhung project of Japan Nitrogenous Fertilizers, nor the Kawasaki venture of Shōwa Fertilizers.

During the twenties, Japan Nitrogenous Fertilizers, the main pioneer of ammonia synthesis in Japan, relied almost entirely on unmodified Casale technology. Even at the huge Hamhung Plant in Korea, few modifications were made, and the size of the ammonia synthesis units

there was identical to the size of those set up at the Minamata Plant, which had been closely modelled on the original Casale prototype. The Suzuki Shōten and Japan Artificial Fertilizers, too, appear to have made no significant innovations at their synthesis plants during the decade. The TIES Process,developed at SNRS from 1919 to 1923 and industrialized by Shōwa Fertilizers in 1930, represented a real degree of modification of the Haber Process, but it cannot be compared with the major innovations of the contemporary West. The inventions of Claude, Casale, Fauser and the NEC researchers were not in any way modifications of the Haber, but distinct processes. In the thirties, although a large number of plants were established, there was even less innovation in ammonia synthesis than in the twenties, as without exception the new plants utilized Western processes.

In contrast to their almost entire dependence on Western ammonia synthesis processes, the Japanese closed the technology gap in viscose rayon almost completely by the mid-thirties. The difference was due to two factors: viscose rayon technology was much simpler and the rate of technological advance was much slower than in ammonia synthesis.

Owing to the tight secrecy of the European rayon cartels and the sluggishness of the Japanese chemical industry prior to World War I, viscose rayon technology was little understood in Japan in 1914. The following decade, however, saw the foundation of Japanese viscose rayon technology through the entrepreneurial activity of Kaneko and Noguchi, made possible by the increasing availability of Western technology. Secrecy in rayon technology declined due to three factors. The estab-

lishment of subsidiaries by the European rayon firms in the U.S. led to leakages of technical information, while the desperate plight of the German companies after the war led to the sale of much formerly secret equipment. A further important factor was the lapsing of many of the basic patents of the viscose process by 1920.

Although there was still a considerable gap between Japan and the West in 1924, the following decade saw the maturation of Japanese viscose rayon technology. In the mid-twenties, Japanese technology still lagged, costs were high and product quality was low, but by the early thirties technology had advanced to such an extent that it could markedly improve on European operating techniques and plant design. In the mid-thirties, technical levels were such that the Japanese were highly competitive on world markets.

The machine-building industry, which supplied equipment for ammonia synthesis and viscose rayon plants, made considerable progress in the interwar period.

When SNRS commenced research on a process for ammonia synthesis in 1919, there was no Japanese firm with significant experience in high-pressure gas equipment manufacture. Yet, by 1930, Mori and Noguchi were able to order a very large part of their total plant, which included much high-pressure equipment, from the home industry. While the Japanese machinery was undoubtedly somewhat inferior to the Western, it was much cheaper.

There was a similar response in rayon equipment; although technical levels were very low at the beginning of the twenties, they were to rise

rapidly throughout the decade. The first machinery supplied to Kaneko's Hiroshima venture in the early twenties was small, crude, and subject to breakdown, but by 1930 there had been a vast improvement. In that year, even as conservative a firm as Mitsui's Oriental Rayon was mainly purchasing machinery of domestic design and manufacture, while most of the equipment installed in the rayon export boom after 1932 was also Japanese. By the mid-thirties, Japanese firms could at times even improve on the design of Western equipment. Like its ammonia synthesis counterpart, Japanese rayon production equipment was certainly somewhat inferior to Western even in the thirties, but it was much lower in price.

The Japanese initiative. The importation of specific rayon and ammonia synthesis technologies was almost solely due to the initiative of the Japanese companies. The transfer of rayon technology was a product of Suzuki's industrial spying in the U.S., Noguchi's investigations in Europe, and Mitsui's approach to Courtaulds in the U.K. Similarly, it was as a consequence of an aggressive search for processes by Takahata of Suzuki and Noguchi, that the ammonia synthesis industry came to be established in Japan. The Kobe office of the German company Iris did play a part in interesting Mori and his associates in the Ude Process, but it was they who proceeded to Europe to investigate that process and its competitors.

The role of the state. While the government played a considerable indirect role, through education, in the introduction of the rayon and ammonia synthesis industries, it played no direct part in the importation of rayon technology, and only a limited direct role in the transfer of

ammonia synthesis to Japan.

It was the excellent state system of higher education, developed during the Meiji Period, that underpinned the technological advances in the chemical industry during the twenties. The Japanese-trained technologists active in the decade were educated almost exclusively at the state universities and technical colleges. Prior to World War I, the private institutions of higher education offered no training in chemical technology whatsoever, and trained few people even in the twenties.

The rayon industry was well-established before the government displayed any interest in its development. Suzuki's Hiroshima Plant was fully operational by 1922 and Noguchi's venture came on stream in mid-1924, but government interest was not evident until 1926 when the state awarded a degree of tariff protection to the industry, and TIES commenced research related to rayon. The quantity of research proved to be small, however, and it was directed to the discovery of domestic substitutes for foreign pulp to save exchange and not to the improvement of the basic technology.

Although the government was extremely aggressive in the development of the TIES ammonia synthesis process at SNRS immediately after World War I, its enthusiasm cooled sharply after 1921, and the later stages of research were poorly funded. The state played no role in the actual introduction of ammonia synthesis manufacturing itself. It neither imposed a protective tariff, nor did it industrialize technology. It was only through the initiative of private enterprise that the TIES technology came to be embodied in a functioning ammonia synthesis plant.

Size of organization. Only large organizations played a significant role in the importation of ammonia synthesis technology, but small firms and groups were active in the early stages of the transfer of viscose rayon technology. All ammonia synthesis plants, without exception, were set up by relatively large companies. Of the smaller institutions active in the tens and early twenties in ammonia synthesis, it is probable that only the Watanabe Chemical Research Station made any real progress. In rayon, however, while only the major firm Suzuki achieved commercial success in the early period, it is highly probable that the small concern Asahi Artificial Silk Thread created a technologically viable process. A number of tiny firms also enjoyed technological success sufficient to allow sales in the unusually favourable conditions of the war boom.

Role of personnel. Important roles in the introduction of the ammonia synthesis and rayon industries were played by both foreign-trained Japanese and the graduates of the state universities.

A considerable role in the transmission of a general knowledge of ammonia synthesis to Japan was probably played by Japanese technicians who had trained or researched in Germany. Tamaru Setsurō and Suzuki Tatsuji are the best-known of these men.

The actual importation of specific processes, however, with the exception of the work of Ishisaka, was essentially carried out by Japanese-trained technologists with relatively little foreign experience. Noguchi, Yokoyama and Nakamura are conspicuous examples. Among the technical group which helped to establish the Nobeoka Plant in 1923, only Kūdō appears to have had foreign training, while none of Mori's

technicians at Kawasaki appear to have been educated abroad.

In viscose rayon, one cannot as readily distinguish between the acquisition of general technical knowledge and the development of specific technology as one can with ammonia synthesis. Of the firms which imported viscose technology prior to 1930, information on technical personnel is only available for Suzuki and the predecessor firm to Asahi Silk Weaving. In the early stages of research, in industrial spying, and in the development of the Hiroshima Plant, Suzuki relied on two Japanese-trained technicians, who had no prior foreign experience. At the Asahi Artificial Silk Thread Company, technical leadership was given by a man who had studied in Germany, though originally trained in Japan.

Method of import of specific technologies. Conceptually, the following section is in part an extension of the work of Uchida Hoshimi.[11] Uchida originated the idea of "self-development", to which I have added the concepts of technology transfer by the method of "maximum involvement" and by methods of an "intermediate type." Whereas Uchida treats a large number of case histories of technology transfer in the chemical industry schematically, I have dealt with a few in depth. This in-depth treatment allows a real evaluation of the suitability of the various methods of technology transfer in differing settings.

There was a great difference in the degree of self-reliance shown in technology transfer by the four companies which we have treated in detail. We will consider rayon and ammonia synthesis separately, as the possible degree of self-reliance was very different for the two industries.

In rayon, Mitsui adopted the method of "maximum involvement." When establishing Oriental Rayon, the firm not only utilized foreign design and equipment, but also deployed foreign technicians to carry out the greater and more essential part of the assembly work. Initially, the plant was operated by the foreigners, and it was only after a few months that the Japanese took over most of the operation.

This method of technology transfer, utilizing highly paid foreign technicians and expensive foreign equipment, offered low risks in exchange for high costs; it was the natural choice for the ultra-cautious but financially powerful Mitsui.

In complete contrast to Mitsui, the Suzuki Shōten was entirely independent of foreign tutelage. Several factors influenced the firm in the choice of method of technology import. Firstly, when Suzuki started to import viscose rayon technology, there seemed to be no possibility of foreign assistance, owing to the tight secrecy of the European companies. Secondly, there was the cost factor. For Kaneko, the advantage of the lower cost of self-development outweighed the disadvantages of the much greater risks and the inevitable disorganization so feared by Mitsui. Thirdly, Kaneko was also much less concerned than Mitsui to preserve a favourable image in the West, and could employ methods not possible for Mitsui.

While in 1914 Suzuki moved to import technology by "self-development," the actual method used over a period of eight years was much more complex. The knowledge obtained from the early stage experimentation at Yonezawa was far from sufficient to permit the establishment of a commercially

competitive plant, but it was invaluable as it enabled the company to spy effectively in the West. The information obtained by this spying, together with the independently acquired expertise, solved the chemical problems of viscose production. Although some progress was made with the spinning equipment by a method combining spying and "self-development," adequate equipment was only obtained by the importation and low-cost copying of European machinery.

Suzuki's method of viscose rayon technology importation thus falls into three phases. Firstly, there was a period of independent experimentation. Secondly, there was a stage of spying, with the successful establishment of the chemical division based on the fruits of spying and independent research. Thirdly, there was a phase of direct copying of foreign equipment, which was essential to establish the spinning division.

In ammonia synthesis, too, there were large differences between companies in the method of technology import. Mitsui's move into ammonia synthesis does not warrant consideration as technology importation, as the firm simply took over a pre-existing, technologically-proven plant. Japan Nitrogenous Fertilizers and the Suzuki Shōten relied completely on foreign processes and, to a degree, on foreign tutelage, but Shōwa Fertilizers was almost entirely independent of foreign assistance.

Japan Nitrogenous Fertilizers adopted the Italian Casale Process and Suzuki imported the French Claude Process. At Japan Nitrogenous Fertilizer's pioneering Nobeoka Plant during construction, departmental heads were Japanese, but there were a number of foreigners among the

technicians. The degree of foreign involvement at Suzuki's Hikoshima Plant is uncertain, but it appears to have been at about the same level as at the Nobeoka Plant. The method of technology importation utilized by these two firms was of a type intermediate between "maximum involvement" and "self-development" and closer to the former.

Japan Nitrogenous Fertilizers' development of the Casale Process was a definite success, thanks to the skill of Noguchi's technologists; Suzuki's transfer of the Claude Process was only a marginal technological success. Due to the lower technical levels, assimilation of the technology was prolonged, and the stage of profitable operation not attained until after the bankruptcy of the parent company.

Possible Applications

The method of "maximum involvement" which offers the advantages of certainty and speed would be appropriate in a developing country where capital was available, but technological levels were fairly low. This situation could occur in a nation like Uruguay in the late nineteenth century where there was a prosperous agricultural sector, but little technical base.[12] The method would be of value too where rapidity of development was important; either to take advantage of a favourable market of short duration, or to capture a market ahead of competitors. Necessary preconditions for the use of this method are the willingness of the possessors of the technology to effect the transfer and the availability of sufficient basic technical skills in the recipient country.

The method of "self-development," which is useful in special circumstances, can be cheap, but is usually uncertain, slow and undignified. It is useful either where it is necessary to reduce capital costs, or where the donation of technology is not possible. The method could be used to advantage where capital is scarce and technical levels are comparatively high, as in the Philippines in recent times.[13] It is the only method which can be used where technology is unavailable because of tight secrecy, or when a country is politically isolated. The method may also be applied in cases where a high degree of foreign involvement is felt to be humiliating and implying cultural inferiority. A possibly useful variant of the method is the two-stage process employed by the Suzuki Shōten, where a period of independent experimentation to give the technical personnel a degree of familiarity with the process is followed by a phase in which these personnel function as industrial spies abroad.

Methods intermediate between "maximum involvement" and "self-development" are of value where technology is available for transfer and where one of two sets of conditions are fulfilled. The first is where technical levels are sufficiently high that relatively little foreign tutelage is required and major savings in outlay on high foreign salaries and expensive foreign equipment can thus be effected. The second is where technical levels are relatively low, but the time taken for the development of a commercially competitive plant is not a critical factor. While slowness in achieving profitable production is a cost, it could well be less than the cost of additional foreign participation.

VII. PHILOSOPHY OF BUSINESS

The Theories of Ranis and Marshall

According to Ranis, the Japanese entrepreneur was "community-centred," that is to say, working essentially to serve the community and nation, and not for any private end. For Ranis "the Schumpeterian entrepreneur, depicted, in his extreme form, as the time-honoured Faustian individual motivated by the inexplicable inner springs of his being to send, to change, to juxtapose. ... will not be found in Japan."[14] Marshall has put forward the thesis that, from early Meiji to World War II, Japanese business claimed, and probably believed, that the purpose of commercial enterprise was the welfare of the state and of the people. He states that it is "quite probable that Japanese business leaders were sincere in their claims about their patriotic motives."[15]

Our study of the three entrepreneurs does not accord with these two interpretations. Our three leaders fall precisely into that category of Schumpeterian entrepreneur which Ranis so graphically describes and so completely removes from the economic landscape of pre-World War II Japan. Mori and Noguchi were highly individualistic, egotistical builders of personal empires. There is no evidence to suggest that they believed themselves to be otherwise, nor, until the revolution of the thirties, did they try to convince others that they were altruistically motivated. Mori, when asked in the mid-thirties whether profit was the motive for his enterprise, replied tersely "Profit nonsense! It's for the benefit of the country." But, master of public relations though he was, he seems to have said singularly little to

justify the existence of his own business or business in general until the rise of revolutionary sentiment. Noguchi, likewise, appears to have said almost nothing concerning the role of business. He did not take even the most elementary steps to improve the image of his company. Kaneko did show some resemblance to Ranis' ideal type. While, like the other two, he seems to have been primarily an empire builder, he appears to have followed strategies of industrialization which were in part motivated by considerations of public welfare. However, he made almost no attempt to justify his activities to the public. In fact, he seemed totally oblivious of public opinion up to the time of the Rice Riots, and afterwards simply donated occasionally to charity. There is no evidence to suggest that he believed the prime purpose of business to be service to the state. Despite the fact that, at least on one occasion, he used the rhetoric of nationalism, his intent was clearly the security and advancement of his firm.

According to Marshall, business was at pains to demonstrate that its purpose was the welfare of the state and of the people, and yet our three entrepreneurs were almost totally uninterested in image-making. Why is there this discrepancy? The difference arises because Marshall's work and this thesis discuss two entirely different segments of Japanese capitalism. When Marshall writes "capital" he means established capital, as almost none of his work refers to the entrepreneurs of the rising companies. He makes no reference whatsoever to the three entrepreneurs whose activities form the core of this thesis.

In the twenties, established capital was not essentially concerned

to defend itself as the bearer of economic progress. It does not appear to have thought such defence necessary. Its concern was to shield itself from socialism and socialist-inspired trade unionism, which seemed to pose the greatest threat in the light of contemporary Western experience. Its principal thrust at this period was to present the established companies as relatively unstratified organizations where management and employees at all levels worked cooperatively for their common welfare and for the nation.[16] Established capital had, however, mistaken its principal enemy. The left-wing movement was small and of little real significance. Later events have shown that the people's basic concern was economic advance, not socialism. It seems scarcely credible that established capital can have so fundamentally misinterpreted the general climate of opinion, but there can be little doubt that it did so. Many contemporaries[17] described the surprise and confusion of the Great Zaibatsu leaders when they discovered the true state of national opinion in the early thirties, and noted their prolonged struggle to formulate appropriate policies.

While established capital was justifying its position to a largely imaginary enemy and neglecting its real foe, the entrepreneurs of the rising companies seem to have felt no necessity to defend themselves. In the early twenties, the enterprises of Mori and Noguchi were not of sufficient size to be much in the public eye, but even later, when their companies were large, they said little. The reason was almost certainly that, unlike the management of established capital, they understood the evolving value system. Our three entrepreneurs were

much closer to Japanese society than the managements of the established firms; they themselves were not born into the elite and they remained in close contact with the rank and file. Noguchi's practice of personal, on-the-spot investigation of factories, his habit of drinking and bathing with employees, spring to mind. Kaneko's close cooperation with the technicians at Yonezawa and Mori's long and intimate association with rather small-scale rural enterprise, afford ample testimony of their knowledge of their employees. Although some of the leaders of the established firms had had very close relations with the work force prior to the Russo-Japanese War, by the twenties they moved largely in the rarefied atmosphere of elite society and seldom appeared in the work place. Japanese society had changed rapidly between late Meiji and late Taishō, but they did not realize this.

In the twenties, our three entrepreneurs probably did not feel the need to justify their activity to themselves or to others; they felt their creativity was in accord with the people's basic aspirations. They were supplying blue-collar jobs and offering career opportunities to technicians and other educated personnel, while at the same time rapidly upgrading the level of Japanese technology and introducing industries important for national self-sufficiency and military strength. What need of words when actions spoke so loudly.

Following the revolution of the early thirties, there was a change in the public relations posture of both established and rising companies. The public, while partly appeased in its desire for economic advance, now vociferously insisted that capital demonstrate its usefulness

to the state. The entrepreneurs of the rising companies, although sure of the public's confidence, did offer some reassurances. Mori occasionally pointed out the national benefits accruing from his enterprise, while Noguchi in the late thirties and early forties released a great deal of information on his industrial activities, giving interviews to journalists and approving the publication of biographies which treated the history of his business in some depth. The public relations "line" of established capital swung to an emphasis on the creativity of capitalism and its contribution to economic advance,[18] as established firms realized that they must justify themselves as the engines of economic progress and the providers of opportunity. Marshall seems to feel that established capital was defending capitalism as a system from the far right and the far left, but it is probable that, with the much clearer vision of society afforded by two years of frenzied study, the new propaganda was mainly directed to the mass of the Japanese people—blue and white collar—who desired economic progress and national glory regardless of the nature of the system.

Let us now turn from image-building to discuss the reality in more detail. Ranis and Marshall are possibly correct in their assessment of the attitudes of the Meiji entrepreneur, but the managements of the established firms in the twenties were not working in the community or national interest, and they cannot have believed that they were doing so.

They had done little to establish the economic infrastructure prior to World War I, and in the twenties were sluggish in the establish-

ment of new industries. They oppressed small business and rising company alike, while in their plants pay was abysmally low and working conditions horrendous. The foreign policies of the governments which they profoundly influenced stressed Japan's collaboration with the West as a junior partner, rather than the achievement of her full stature as a nation.

The entrepreneurs of the rising companies, for their part, were intent on the creation of personal empire, not on the advancement of their personnel, their community, nor yet their country. One can only conclude that, in the period following World War I, the community-centred entrepreneur was a myth.

Intercompany Conflict

In its public pronouncements during the twenties, established capital decried the profit motive and stressed harmony, saying nothing of intercompany conflict. A casual reading of established capital's propaganda leaves one with the vague impression that all firms were brothers toiling together for the common good. Our study belies this impression. There was, as we have seen, considerable conflict; much of a ferocity unparallelled in the contemporary West.

To be sure, some of the milder tactics employed by established capital had their counterparts in the contemporary West. Appropriation and denial of water rights by rivals was far from unknown in Europe or the U.S.; nor yet was the refusal of marketing facilities a purely Japanese practice. Western textile capital, for example, was not slow

to exclude Japanese products from many of its market areas during the thirties. The more savage methods, however, found no parallel in the post-World War I West. The bankrupting of the Suzuki Shōten and the ousting of the Wakatsuki Cabinet in 1927, which placed the entire national economy in jeopardy, and the calculated incitement of mobs to selective attack on the installations and personnel of the same company in 1918, found no counterpart in the West.

In describing the conflict between the established firms and the rising companies between 1918 and 1931, much concerning the relation of the business and political worlds has come into focus. In Western writing to date there have been basically two approaches to the relationship. The first virtually ignores the influence of business on politics, and is concerned with the policies and manoeuvres of the parties. The second certainly recognizes the influence, but regards it has having been overstressed in the past, and downplays its importance. Let us consider these two approaches in turn.

By far the most detailed and best-documented work on the politics of the period is that of Duus.[19] The shifting alliances of the parties, their policies, and their leading personalities are clearly described, while the changing social and ideological backdrop is well depicted. One seeks in vain, however, for any real explanation of why the parties follow their chosen policies and the reasons for the shifts in alliances. The work is of great value as a parliamentary record in digest form, but it describes politics in a vacuum, largely divorced from its

economic context. It is a little like watching a scene in a play where several characters are speaking their parts, but we are only allowed to hear two or three of them, while the principal character remains inaudible. This form of political history certainly has the advantage of avoiding the element of speculation, but it cannot claim to represent reality. It can only be a stage in the progress toward a knowledge of reality.

The second school is represented by such writers as Scalapino[20] and Tiedemann,[21] though they have not given their views at length. In default of any considerable recent exposition, we may take Scalapino's position as being representative. He states that "There can be no doubt that business exerted great influence on party policy and that ties between the parties and certain industrial groups were exceedingly close." He qualifies this, however, with especial reference to the connection of the First Katō Cabinet (1924) with Mitsubishi, arguing that, while there is "an undeniable core of truth" in the charges that the old zaibatsu powerfully influenced the parties, there is "also an element of distortion and oversimplification in them."[22] He asserts that more than one firm was influential in each of the major parties, and that the old zaibatsu were less powerful in politics in the twenties than they had been formerly. Scalapino further claims that, until the election of 1928, the rural landlord class controlled a majority of the votes and were thus a powerful influence in party politics.

In criticism of Scalapino, I would make two main points. Firstly, while it is true that other firms did have links with the major political parties, the connection of each of the Great Zaibatsu to its

particular party was very close and its influence overwhelmingly the greatest. Secondly, other political influences on the parties were at most times rather weak. Let me demonstrate this by demolishing Scalapino's objections to the concept of Great Zaibatsu hegemony.

The links which bound Mitsubishi to the Kenseikai were strong indeed. It is not just that the two most powerful members of the Cabinet were aligned with the Iwasaki family by marriage. The family was extremely hierarchical and authoritarian; marriage into it must have implied obedience to the family head. Mitsubishi influenced the Kenseikai, not merely by family links and funding as Scalapino suggests, but probably through the Tosa connection as well. A number of prominent Kenseikai members, Hamaguchi and Kataoka to mention only two, were of Tosa origin, and the Iwasaki family which had its roots in Tosa would have found natural allies in such men.

It is hard to sustain the argument that the rural landlord class retained a great deal of political influence after World War I. Government policies in the twenties were designed to subsidize the urban areas at the expense of the countryside. In spite of chronic rural depression due to low silk prices, the government continued to import cheap colonial rice, benefiting the townsman but impoverishing the farmer. Rural interests were also unsuccessful, until the thirties, in obtaining any legislation from the Diet to lower the price of fertilizer to the farmer. The landlord would have protected his interests better, had he been able to do so.

In our period, at least since World War I, the dominant voice in the countryside was not that of the landlord, but that of the Great Zaibatsu. As we have seen, the two great combines were not only important in rural finance, but controlled the fertilizer sales network and marketed most of the raw silk exported from Japan. Their political power in the countryside must have been enormous. During the twenties, rural influence in politics declined rather than advanced, as the urban banks strengthened their position relative to their rural counterparts. The significance of the political change of 1918 was precisely that power moved from the rural-based oligarchs to the urban Great Zaibatsu.

VIII. THE ECONOMIC POLICIES OF THE TWENTIES

The deflationary government policies of the twenties greatly slowed the rate of economic growth, in direct contradiction to the wishes of most of the people, who fervently desired economic advance. These policies, in the light of events in the thirties, were a blunder of the first magnitude.

Why did the government determine on deflation? We can only speculate, but there are two obvious possibilities. One is that macro-economics were even less well understood then than they are now, and that the government failed to realize the inhibiting effect on economic growth of policies designed to bring Japanese prices down to the world price level. The other possibility is that the government understood all too well that deflationary policies resulted in the reduction of business activity, and sometimes in the bankruptcy of the financially

weaker production and trading companies. The Suzuki Shōten was merely the most spectacular victim of many casualties of these policies. This possibility should not be lightly discarded, as the government was powerfully influenced in the twenties by the Great Zaibatsu, who had much to gain from the crippling of weaker companies and the consequent maintenance of their own economic hegemony. This is an area in which further research is required.

CONCLUSIONS

FOOTNOTES

[1]For example, R. A. Scalapino, Democracy and the Party Movement in Prewar Japan: The Failure of the First Attempt (Berkeley: University of California Press, 1953), pp. 281-282.

[2]Robert P. G. Steven, "Cabinet Responsibility, the Separation of Powers and the Making and Breaking of Cabinets in Japanese Politics 1890-1940" (unpublished Ph.D. thesis, University of British Columbia, Vancouver, 1974).

[3]Katagiri Ryūkichi, Hantō no Jigyō Ō: Noguchi Jun (Tokyo: Tōkai, 1939), author's preface.

[4]G. C. Allen, A Short Economic History of Modern Japan 1867-1937 (second edition; London: Allen & Unwin, 1962); and W. W. Lockwood, The Economic Development of Japan: Growth and Structural Change (Princeton: Princeton University Press, 1954).

[5]L. F. Haber, The Chemical Industry 1900-1930: International Growth and Technological Change (Oxford: Clarendon Press, 1971), pp. 59 and 362-365.

[6]For example, Ian Little, Tibor Scitovsky and Maurice Scott, Industry and Trade in Some Developing Countries: A Comparative Study (London: Oxford University Press, 1970).

[7]Joel Bergsman, Brazil: Industrialization and Trade Policies (London: Oxford University Press, 1970); Jagdish N. Bhagwati and Padma Desai, India: Planning for Industrialization (London: Oxford University Press, 1972); Timothy King, Mexico: Industrialization and Trade Policies Since 1940 (London: Oxford University Press, 1970); Stephen R. Lewis, Jr., Pakistan: Industrialization and Trade Policies (London: Oxford University Press, 1970); and John H. Power, Gerardo P. Sicat and Mo-Huan Hsing, The Philippines and Taiwan: Industrialization and Trade Policies (London: Oxford University Press, 1971).

[8]John H. Power, Gerardo P. Sicat and Mo-Huan Hsing, The Philippines and Taiwan: Industrialization and Trade Policies (London: Oxford University Press, 1971), p. 187.

[9]E. J. Feuchtwanger (ed.), Upheaval and Continuity: A Century of German History (Pittsburgh: University of Pittsburgh Press, 1973), p. 21; Harold Lasswell, Analysis of Political Behaviour (London, 1949), p. 236; and Edgar Mowrer, Germany Puts the Clock Back (London: Penguin Books, 1938), pp. 107-108.

[10]For example, Hamaguchi Haruhiko, "Sen Kyūhyaku Sanjū Nendai no Shin Chūkansō no Dōkō," Shakai Kagaku Kenkyū, Vol. 45, No. 17-3.

[11]Uchida Hoshimi, "Taishō: Shōwa Shoki no Kagaku Kōgyō ni Okeru Gijutsu Dōnyū to Jishu Kaihatsu: Kokusai Gijutsu Iten Katei to Shite Mita Kigyō Katsudō," Keiei Shigaku, Vol. 7, May, 1972.

[12]Statement by Rondo Cameron at a seminar at the University of British Columbia, Autumn, 1971. (Author of several works on development economics and editor of Banking in the Early Stages of Industrialization (New York: Oxford University Press, 1967).

[13]Statement by W. A. Triggs, 1966 (then a senior engineer with Placer Development and active for several years in the Philippines).

[14]Gustav Ranis, "The Community-Centred Entrepreneur in Japanese Development," Explorations in Entrepreneurial History, 8:81, December, 1955.

[15]Byron K. Marshall, Capitalism and Nationalism in Prewar Japan: The Ideology of the Business Elite 1868-1941 (Stanford: Stanford University Press, 1967), p. 4.

[16]Ibid., p. 98.

[17]For example, Takahashi Kamekichi, "Kyodai Zaibatsu no Hōkō Tenkan," Chūokōron, May, 1932, p. 67; and Noda Yutaka, "Mitsubishi Zaibatsu Ron," Chūokōron, May, 1934, p. 268.

[18]Marshall, op. cit., pp. 106-107 and 109.

[19]Peter Duus, Party Rivalry and Political Change in Taishō Japan (Cambridge, Mass: Harvard University Press, 1968).

[20]Scalapino, op. cit.

[21]Arthur E. Tiedemann, "Big Business and Politics in Prewar Japan," Dilemmas of Growth in Prewar Japan, James W. Morley, editor. (Princeton: Princeton University Press, 1971).

[22]Scalapino, op. cit., pp. 282-283.

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APPENDIX

METHODS OF INTERNATIONAL TECHNOLOGY TRANSFER

Methods of international technology transfer, classified by the degree of foreign tutelage involved, range from instances where the role of foreigners is non-existent, to cases of complete dependence on foreign instruction.

In the case of minimum involvement, a method may be envisaged, whereby a home country group of technicians, or a company, uses published and private written materials, which only treat the basic processes in a general way (i.e. do not deal with any specific process which has been successfully embodied in physical plant abroad) and itself develops a process identical to, or a close variant of, a specific process which is already in industrial use abroad.

The home country group of technicians, or company, then proceeds to make its own design for a plant, to have machinery built by domestic manufacturers, and, on completion of the plant, to operate with no foreign aid. I have called this the method of "self development" or "minimum involvement."

At the other end of the range, the case of maximum involvement, a group of technicians, or a company, desiring to import a specific process from abroad, brings in a number of foreign technicians, who proceed to set up a plant of foreign design, utilizing solely equipment which has been manufactured abroad. When constructed, this plant is then operated by the foreign technicians, who gradually train the technicians of the home country to take over the plant. I have called

this the method of "direct borrowing" or "maximum involvement."

Most cases of technology transfer fall somewhere between these two extreme cases.

TECHNOLOGY OF VISCOSE RAYON MANUFACTURE[1]

The steps in the manufacture of viscose rayon are as follows:

1. Preparation of the Alkali Cellulose

The raw materials are boards of pulp with an 88-92 per cent alpha cellulose content made from hemlock or spruce wood. The pulp boards are soaked in a 17-18 per cent solution of caustic soda which is later drained off and the sheets are then compressed by a hydraulic ram until their wet weight is approximately three times their previous dry weight, i.e. so there is a definite ratio of pulp to caustic soda. The pulp and the added caustic soda is now referred to as alkali cellulose.

2. Shredding

The alkali cellulose is then shredded; the fragments so produced being called crumbs.

3. Aging

The crumbs are aged to an appropriate degree in an aging cellar at a constant temperature of 18-20 degrees centigrade.

4. Xanthating

After aging, carbon disulphide is added to the crumbs and the mixture rotated for two to three hours in a revolving drum, causing the production of cellulose xanthate.

5. Preparation of the Spinning Liquid

The cellulose xanthate is then mixed with a measured quantity of caustic soda and viscose is produced. Viscose is a complex compound containing cellulose in a form which can be spun into a thread.

6. Filtration

The cellulose solution is then filtered to eliminate impurities.

7. Maturation

The filtered cellulose is matured for several days in an even temperature to effect the removal of entrained air.

8. Spinning

The mature cellulose is now spun. It is delivered at a constant rate by a small pump to a nozzle with a platinum cap from which it is extruded into a spinning bath which has the following composition: warm water (40-45°C), 8-10% sulphuric acid, 13½-21% sodium sulphate, 1% zinc sulphate, 4-10% corn sugar or glucose. On extrusion into the bath the viscose coagulates and the acid of the bath neutralizes the caustic soda in the viscose.

The extruded filaments are led from the acid bath to the "Topham box" or centrifugal pot. The pot of 7 inch diameter and 4-6 inch depth rotates at 6-10,000 r.p.m.; the centrifugal force imparting a twist of about 2½-3 turns per inch to the wet filaments as they are forced against the walls of the pot and also causing the discharge of much of the residual bath liquid from the filament. As spinning proceeds, filament gradually accumulates in the pot, which has to be emptied after each two hours of operation.

Using a different spinning method, yarn can also be wound on to bobbins. It is not twisted as in the pot method described above and twisting has to be done later.

9. Finishing

The finishing process consists of washing, desulphurizing, bleaching and drying.

FOOTNOTES

[1]H. R. Mauersberger and E. W. K. Schwartz, Rayon and Staple Fiber Handbook (New York: Rayon Handbook Company, 1939), pp. 85-101.

THE TRANSFORMED AMMONIA PROCESS[1]

(AMMONIA FROM CYANAMIDE PROCESS)

The transformed ammonia process was usually operated in conjunction with a plant producing calcium cyanamide, which was the basic raw material for the process.

Superheated steam was passed around calcium cyanamide piled in trays inside a tower and the reaction produced calcium carbonate and ammonia. The solid calcium carbonate remained behind on the trays, while the gaseous ammonia passed off with the residual superheated steam. The gas mixture was usually fed into a tank of sulphuric acid, where ammonium sulphate was formed.

The processs came into use shortly after the invention of the Frank and Caro Process for calcium cyanamide in 1906. It had certainly been superceded by synthetic ammonia processes by 1920, but established plant continued to operate long after this. The process appears to have become obsolete in the U.S. by 1941.

FOOTNOTES

[1]Geoffrey Martin (ed.), Industrial and Manufacturing Chemistry Part II, Inorganic (London: Crosby Lockwood & Son, 1917), p. 472; and W. L. Badger and E. M. Baker, Inorganic Chemical Technology (New York: McGraw Hill, 1941), p. 108.

THE TECHNOLOGY OF THE AMMONIA SYNTHESIS PROCESS[1]

In all processes, nitrogen and hydrogen are combined directly in the presence of a catalyst, the function of which is to induce a reaction giving a high percentage of ammonia in the resultant gas mixture at a relatively low temperature.

The nitrogen and hydrogen gas mixture may be prepared in two ways.

1. By mixing two volumes of water gas with one volume of producer gas and adding nitrogen in the correct proportion.

2. By preparing hydrogen and nitrogen separately and then mixing them in the proportion of three volumes of hydrogen to one volume of nitrogen. The nitrogen may be prepared by fractional distillation of liquid air and the hydrogen by electrolysis of water, or by liquefication of coke oven gas and fractional distillation of the hydrogen component.

The gas mixture is fed to the synthesis tower and passed over the catalyst, the ammonia being removed from the resultant mixture of gases by either a process of absorption or of refrigeration. In the former process, the ammonia is dissolved in water which is later depressurized, releasing much of the ammonia from solution. In the latter process, the gases from the synthesis tower are cooled, and a large portion of the ammonia gas is liquefied and can thus be removed.

In the 1920's, there were the following processes of ammonia synthesis:

1. The Haber Process was the first to be invented. It operated at 200 atmospheres and 500° Centigrade.

2. The Claude Process utilized pressures of 1,000 atmospheres and a temperature of 700° Centigrade. The gas was not circulated, but passed once through a number of converters in series.

3. The Casale Process operated at 600-700 atmospheres pressure and a temperature of 500° Centigrade. It employed gas jets to pump the gases.

4. The Fauser Process was very closely related to the Haber Process and operated at 250 atmospheres and a temperature of 550°-600° Centigrade.

5. The Ude or Mont Cenis Process operated at a pressure of 120 atmospheres with a catalyst of iron cyanide.

6. The Nitrogen Engineering Corporation (NEC) Process - little information is available on this process.

FOOTNOTES

[1]Frank A. Ernst, Fixation of Atmosphere Nitrogen (New York: D. Van Nostrand Company Inc., 1928), pp. 53-68, 85-87; A. J. Harding, Ammonia:Manufacture and Uses (London: Oxford University Press, 1959), p. 3; and W. L. Badger and E. M. Baker, Inorganic Chemical Technology (New York: McGraw Hill Book Company Inc., 1928), p. 111.

TABLE LIV

AMMONIA SYNTHESIS PLANTS IN THE JAPANESE EMPIRE 1923-1940

Company name	Factory site	Company established	Start of production	Process	Initial planned capacity*
Japan Nitrogenous Fertilizers	Nobeoka Miyazaki Pr.	Jan 1906	Oct 1923	Casale	12,500
Claude Process Nitrogen Industries (Number One Nitrogen Industries)	Hikoshima Yamaguchi Pr.	Apr 1922	Oct 1924	Claude	9,000
Japan Nitrogenous Fertilizers	Minamata Kumamoto Pr.	Jan 1906	Mar 1926	Casale	60,000
Japan Artificial Fertilizers	Hayaboshi Toyama Pr.	Feb 1887	Mar 1928	Fauser	30,000
Shōwa Fertilizers	Kawasaki Kanagawa Pr.	Oct 1928	Mar 1931	TIES	150,000
Sumitomo Fertilizer Plant	Niihama Ehime Pr.	Jun 1925	Apr 1931	NEC	30,000
Korean Nitrogenous Fertilizers	Hamhung Korea	May 1927	Jan 1930	Casale	120,000
Miike Nitrogen Industries	Ōmuta Fukuoka Pr.	Aug 1931	Jan 1932	Claude	36,000

TABLE LIV (CONTINUED)

Company name	Factory site	Company established	Start of production	Process	Initial planned capacity*
Yasaku Industries	Nagoya Aichi Pr.	May 1933	Dec 1933	Ude	36,000
Ube Nitrogen Industries	Ube Yamaguchi Pr.	Apr 1933	Jul 1934	Fauser	50,000
Manchurian Chemical Industries	Dairen Manchuria	May 1933	? 1935	Ude	100,000
Niigata Sulphuric Acid	Niigata Niigata Pr.	Sep 1896	Apr 1937	Claude	10,000
Japan Tar Industries	Kurosaki Fukuoka Pr.	Aug 1934	Sep 1937	IG	80,000
Taki Fertilizer Plant	Beppu Hyōgō Pr.	Mar 1885	Apr 1938	IG	50,000
Japan Patent Fertilizers	Yokohama Kanagawa Pr.	? 1919	Feb 1939	IG	50,000
Nittō Chemical Industries	Hachinohe Aomori Pr.	Aug 1937	Feb 1940	IG	50,000

*Tons of ammonium sulphate per year

GLOSSARY

NOTE: Anyone wishing to have the Chinese characters for any particular term should apply to the author through the University of British Columbia.

I. JAPANESE TERMS

Asano (Zaibatsu)	Asano (Combine)
Bakufu: (Tokugawa) Bakufu	The Tokugawa Government
Beppu	A city in Ōita Prefecture, North Kyushu
Changjin Kang (Chōtsukō)	River in North Korea: reservoir situated 40°29'N, 127°15'E
Chōshū han	Chōshū barony: located in present-day Yamaguchi Prefecture
Dōshikai: (Rikken) Dōshikai	(Constitutional) Fellow Thinkers' Association
Edo	Name of Tokyo prior to 1868
Eshū Zaibatsu	Eshū Combine
Furukawa (Zaibatsu)	Furukawa (Combine)
Genrō	Oligarch
Gun	County: an administrative division within a prefecture until 1926 and after this time a postal division
Hachinohe	Place in Aomori Prefecture
Hamhung (Kōnan)	Place in Korea situated 39°50'N, 127°37'E
Han	Feudal barony in Tokugawa Period
Harima	Place in Kobe Prefecture
Hatano	Place in Kanagawa Prefecture
Hayaboshi	Place in Toyama Prefecture
Hikoshima	Island just off the coast of the extreme West end of Honshu
Hizen han	Hizen barony: located in present-day Nagasaki Prefecture

Ishikawajima	Firm involved mainly in shipbuilding
Iwakuni	Place in Yamaguchi Prefecture: site of Teijin's second rayon plant
Jiji	Current Events
Jitsugyō Dōshikai	Business Fellow Thinkers' Association
Jiyū Hōsō Dan	Freedom Propaganda Group
Jiyūtō	Liberal Party
Kaga han	Kaga barony: located in the present-day Ishikawa Prefecture
Kagami	Place in Kumamoto Prefecture
Kaishintō: (Rikken) Kaishintō	(Constitutional) Progressive Party
Kakushin Kurabu	Reform Club
Kamaishi	Place in Iwate Prefecture
Kantō	Plain in which Tokyo is situated
Kase	Place in Niigata Prefecture
Kawasaki (Zaibatsu)	Kawasaki (Combine)
Keelung (Kiirun)	City in the extreme north of Taiwan
Kenkyūkai	Study Association
Kenseikai	Constitutional Association
Kōchi	Place in southern Shikoku and the capital of the Tosa han during the Tokugawa Period
Kokumin Dōshikai	Nationalist Fellow Thinkers' Association
Kuhara (Zaibatsu)	Kuhara (Combine)
Kurosaki	Place in the north of Kyushu
Mangyō (Manshū Kōgyō)	Manchurian Industries: a great state-operated combine

Matsuzaka	Town in Mie Prefecture
Miike	Town in Fukuoka Prefecture near Ōmuta
Minamata	Town in Kumamoto Prefecture now notorious for mercury pollution of fish
Mitsubishi (Zaibatsu)	Mitsubishi (Combine)
Mitsubishi Gōshi Kaisha	Mitsubishi Limited Partnership
Mitsubishi Shōji	Mitsubishi Trading
Mitsui (Zaibatsu)	Mitsui (Combine)
Mitsui Bussan	Mitsui Products
Mitsui Gōmei Kaisha	Mitsui Unlimited Partnership
Moji	Port in Fukuoka Prefecture
Niigata	City in Niigata Prefecture
Niihama	Town in Ehime Prefecture, Shikoku
Nisshō	Japan Trading
Nobeoka	Town in Miyazaki Prefecture
Ōmuta	Town in Fukuoka Prefecture
Pujon Kang (Fusenkō)	River in North Korea: reservoir situated 40°35'N, 127°33'E
Saionji (Kimmochi)	Last of the oligarchs: his influence on cabinet formation lasted into the thirties
Sakurakai	Cherry Blossom Society: group of middle-ranking Army officers of national socialist persuasion formed in 1930
Sankyō	Sankyō Company Limited
Satsuma han	Satsuma barony: located in present-day Kagoshima Prefecture
Seishō	Politically-linked-trading company

Seiyūhontō	Orthodox Seiyū Party
Seiyūkai (Rikken Seiyūkai)	Friends of Constitutional Government Association
Shizuoka	City located between Tokyo and Nagoya in Shizuoka Prefecture
Sumitomo (Zaibatsu)	Sumitomo (Combine)
Suzuki Shōten	Often translated as Suzuki and Company: literally Suzuki Trading
Toba	Place in Mie Prefecture
Tosa han	Located in Shikoku: approximates to the present-day Kōchi Prefecture
Toyama	City in Toyama Prefecture
Ube	Town in Yamaguchi Prefecture
Yahata (Yawata)	Town in Fukuoka Prefecture now incorporated in the city of Kitakyūshū
Yasuda (Zaibatsu)	Yasuda (Combine)
Yonezawa	Town in Yamagata Prefecture
Yuasa Shōten	Yuasa Trading

II. ENGLISH TERMS

Agricultural Experimental Organization	Nōji Shikkenjo
Aichi Bank (located in Nagoya)	Aichi Ginkō
" " (" " Saga Prefecture)	" "
Akaji Savings Bank	Akaji Chōchiku Ginkō
Akashi Trade and Industry Bank	Akashi Shōkō Ginkō
Akita College of Mining	Akita Kōzan Senmon Gakkō
All Japan Brewing	Dainihon Shurui Jōzō
All Japan Purchasing Union (AJPU)	Zenkoku Kōbai Kumiai Rengōkai (Zenkōren)
Ammonium Sulphate Research Group	Ryūan Chōsa Kai
Artificial Silk Thread Industries	Jinzō Kenshi Kōgyō
Asahi Artificial Silk Thread Company	Asahi Jinzō Kenshi K.K.
Asahi Bemburg	Asahi Bemburugu
Asahi Glass	Asahi Garasu
Asahi Oil	Asahi Sekiyu
Asahi Silk (Asahi Silk Weaving)	Asahi Kenshoku
Asanuma Bank	Asanuma Ginkō
Association(s)	Rengōkai
The Authority of the Debating World: A New Era	Genronkai No Keni: Shinjidai
Bank of Japan	Nippon Ginkō
Bank of Korea	Chōsen Ginkō
Bank of Taiwan	Taiwan Ginkō
Bank of Taiwan Investigation Committee	Taiwan Ginkō Chōsa Kai

Blood-Brotherhood	Ketsumeidan
Bōsō Marine Products	Bōsō Suisan
Chairman of the Board of Directors	Rijichō
Changjin Kang Hydro-electric	Chōtsukō Denryoku
China Camphor	Shina Shōnō
Chiyoda Trust	Chiyoda Shintaku
Chōfū Land	Chōfū Tochi
Claude Process Nitrogen Industries	Kurōdoshiki Chisso Kōgyō
College of Technology	Kōbu Daigaku
Continental Lumber Industries	Tairiku Mokuzai Kōgyō
"Control Faction" of the Army	Tōsei Ha
Daidō Fertilizers	Daidō Hiryō
Dai-ichi Bank	Dai-ichi Ginkō
Dairi Sugar Refining	Dairi Seitō
Development Cooperative(s)	Sangyō Kumiai
Dōkō Weaving	Dōkō Bōshiki
Earthquake Bills	Shinzai Tegata
Earthquake Bills Discounting Loss Indemnification Law	Shinzai Tegata Warabiki Sonshitsu Hōsho Rei
Earthquake Bills Remedial Measures Bill	Jishin Tegata Zengo Shori Hō
East Asia Flour Mills	Tōa Seifun
East Asia Tobacco	Tōa Tobako
Eastern Industries	Azuma Kōgyō
Eighty-Fourth Bank	Dai Hachijūyon Ginkō
Electro-chemical Industries	Denki Kagaku Kōgyō

Hayakawa Bank	Hayakawa Ginkō
Higashi Katsu Bank	Higashi Katsu Ginkō
Hiji Spinning and Weaving	Hiji Bōshoku
Hikoshima Crucibles	Hikoshima Kanka
Hikoshima Refinery, Nitrogen Plant, Limited Stock Company	Kabushiki Kaisha Hikoshima Seirensho Chisso Kōjo
Himeji Division	Himeji Shidan
Hirobe Bank	Hirobe Ginkō
Hiroshima Industrial Bank	Hirōshima Sangyō Ginkō
Hiroshima University of Literature and Science	Hirōshima Bunrika Daigaku
Hisa Trading	Hisa Shōkai
Hokkaido Coal and Steamship	Hokkaidō Tankō Kisen
Hokkaido Imperial University (University of Hokkaido)	Hokkaidō Teikoku Daigaku
Homeland Foodstuffs	Naikoku Shokuhin
Hōnen Oil Refining	Hōnen Seiyu
Hundredth Bank	Dai Hyaku Ginkō
Hypothec Bank of Japan	Nihon Kangyō Ginkō
Imabari (Trade) Bank	Imabari (Shōgyō) Ginkō
Imperial Agricultural Association (IAA)	Teikoku Nōkai
Imperial Artificial Silk Thread Limited Partnership	Teikoku Jinzō Kenshi Gōshi Kaisha
Imperial Asahi Bank	Teikoku Asahi Ginkō
Imperial Beer	Teikoku Biiru
Imperial Camphor	Teikoku Shōnō

Engineering Bureau: a branch of the Ministry of Agriculture and Commerce	Kōmukyoku
Fertilizer Administration Bill	Hiryō Kanri An
Fertilizer Distribution Investigation Council	Hiryō Haikyū Chōsa Iinkai
Fertilizer Investigation Council	Hiryō Chōsa Iinkai
Fifteenth Bank	Dai Jūgo Ginkō
First Movement for Constitutional Government	Dai-ichi Ji Goken Undō
Fuji Gas Spinning	Fuji Gasu Bōseki
Fuji Textiles	Fuji Seni
Fujihara-Bosch Agreement (FBA)	Fujihara-Bosshu Kyōtei
Fujita Bank	Fujita Ginkō
Fukatani Trade Bank	Fukatani Shōgyō Ginkō
Fukuoka Paper	Fukuoka Seishi
Fukushima Collieries	Fukushima Tankō
Fukushima Rayon	Fukushima Jinken
Fukushima Spinning	Fukushima Bōseki
Fukushima Trade Bank	Fukushima Shōgyō Ginkō
Giran Industries	Giran Shokusan
Government-General of Korea	Chōsen Sōtoku-fu
Government-General of Taiwan	Taiwan Sōtoku-fu
Governor-General of Korea	Chōsen Sōtoku
Governor Kiyono	Kiyono Chōtarō
Harima Shipbuilding	Harima Zōsen
Hataaki Bank	Hataaki Ginkō

Imperial Coal Industries	Teikoku Tangyō
Imperial Dyestuff Manufacturing	Teikoku Senryō Seizō
Imperial Match	Teikoku Matchi
Imperial Rayon	Teikoku Jinzō Kenshi (Teijin)
Imperial Rayon No.2	Dai-ni Teikoku Jinken
Imperial Steamships	Teikoku Kisen
Imperial University	Teikoku Daigaku
Imperial University College of Engineering	Teikoku Daigaku Kōka Daigaku
Imperial Way Faction of the Army	Kōdō-ha
Industrial Bank: located in Kagoshima Prefecture	Kinken Ginkō
Industrial Bank of Japan	Nihon Kōgyō Ginkō
International Steamships	Kokusai Kisen
Izumo Weaving	Izumo Seishiki
Japan Airbrake	Nihon Eyābureki
Japan Artificial Fertilizers	Dainihon Jinzō Hiryō
Japan Artificial Textiles	Nihon Jinzō Seni
Japan Artificial Thread Limited Partnership	Nihon Jinzōshi Gōshi Kaisha
Japan Artificial Wool	Nippon Jinzō Keori
Japan Bicycles	Nihon Ringyō
Japan Brewing	Nihon Shurui Jōzō
Japan Camphor	Nihon Shōnō
Japan Celluloid	Dainihon Seruroido
Japan Cement	Nihon Semento

Japan Chemical	Nihon Kagaku
Japan Colonization	Nihon Takushoku
Japan Education and Life Insurance	Nihon Kyōiku Seimei Hoken
Japan Explosives Manufacturing	Nihon Kayaku Seizō
Japan Fertilizer Sales Union	Zen Nihon Hiryōshō Renmei
Japan Flour Mills	Nihon Seifun
Japan Iodine	Nihon Yōdo
Japan Mail Line	Nihon Yūsen Kaisha
Japan Metallurgy	Nihon Yakin
Japan Metals	Nihon Kinzoku
Japan Nitrogenous Fertilizers (JNF)	Nihon Chisso Hiryō
Japan Patent Fertilizers	Nihon Tokkyo Hiryō
Japan Raw Cotton	Nihon Menka
Japan Rayon	Nihon Rēyon
Japan Salt Industries	Dainihon Engyō
Japan Soda	Nihon Sōda
Japan Spinning	Dainippon Bōseki
Japan Steel	Nippon Seikōsho
Japan Steel Pipe	Nippon Kōkan
Japan Sugar Refining	Dainihon Seitō
Japan Tar Industries	Nippon Tāru Kōgyō
Japan Trading	Nihon Shōgyō
Japan Trawling	Nihon Torōru
Japan Wool Weaving: Rayon Division	Nihon Mōshoku: Jinken Bu
Judgement Stand	Hyōdan

Kamitsuke Muslin	Kamitsuke Mosurin
Kanegafuchi Spinning	Kanegafuchi Bōseki
Kanmon Pottery	Kanmon Tōgyō
Kasashina Bank	Kasashina Ginkō
Kataoka Blunder (Kataoka's slip of the tongue)	Kataoka Shitsugen
Kawaizumi Bank	Kawaizumi Ginkō
Kawasaki Bank	Kawasaki Ginkō
Kawasaki Plant	Kawasaki Kōjo
Kawasaki Shipyards	Kawasaki Zōsenjo
Keio University	Keio Daigaku
Kimura Family	Kimura Dōzoku
Kiryū College of Dyeing	Kiryū Kōtō Senshoku Gakkō
Kishiwada Rayon	Kishiwada Jinken
Kishiwada Spinning	Kishiwada Bōseki
Kobe Engineering	Kobe Seisakusho
Kobe Paper	Kobe Seishisho
Kobe Steel	Kobe Seikōsho
Komaba Agricultural School	Komaba Nōgakkō
Kone Bank	Kone Ginkō
Konoike Bank	Konoike Ginkō
Korean Hydroelectric	Chōsen Suiden
Korean Nitrogenous Fertilizers (KNF)	Chōsen Chisso Hiryō
Korean Production Bank	Chōsen Shokusan Ginkō
Korean Railways	Chōsen Tetsudō
Kuki Bank	Kuki Ginkō

Kumamoto Technical College	Kumamoto Kōtō Kōgyō Gakkō
Kurashiki Silk	Kurashiki Kenshoku
Kurashiki Spinning	Kurashiki Bōseki
Kurate Bank	Kurate Ginkō
Kurita Bank	Kurita Ginkō
Kuwafune Bank	Kuwafune Ginkō
Kyoto Chemical Research Station	Kyōto Kagaku Kenkyūjo
Kyoto College of the Industrial Arts	Kyōto Kōtō Kōgei Gakkō
Kyoto Imperial University (University of Kyoto)	Kyōto Teikoku Daigaku
Kyushu Imperial University (University of Kyushu)	Kyūshū Teikoku Daigaku
Kyushu Railway Control Bureau	Kyūshū Tetsudō Kanri Kyoku
Mail Steamship Line	Yūbin Jōkisen Kaisha
Manchurian Chemical Industries	Manshū Kagaku Kōgyō
Manchurian Prosperity Spinning	Manshū Fukubō
Manchurian Spinning	Manshū Bōseki
Matsuzaka Industrial School	Matsuzaka Kōgyō Gakkō
May 15th Rising (1932): an unsuccessful coup staged by naval officers and peasants. Linked to the Ketsumeidan Conspiracy	Go Jū Go Jiken
Meiji College	Meiji Senmon Gakkō
Meishō Rayon	Meishō Rēyon
Meishō Spinning and Weaving	Meishō Bōshoku
Menka Rayon	Menka Jinken
Menka Spinning	Menka Bōseki
The Mercury Vapour Lamp	Suiginrō

Miike Coal Mining	Miike Tankō
Miike Nitrogen Industries	Miike Chisso Kōgyō
Miike Spinning	Miike Bōseki
Mikuni Spinning	Mikuni Bōseki
Military Vehicle Aid Law	Gunyō Jidōsha Hojo Hō
Ministry of Agriculture and Commerce	Nōshō-shō
Ministry of Agriculture and Forestry (MAF)	Nōrinshō
Ministry of Communications	Teishin Shō
Ministry of Finance	Ōkurashō
Ministry of Foreign Affairs	Gaimushō
Mitsubishi Aircraft	Mitsubishi Kōkūki
Mitsubishi Bank	Mitsubishi Ginkō
Mitsubishi Electrical Machinery	Mitsubishi Denki
Mitsubishi Exchange	Mitsubishi Kawase Ten
Mitsubishi Internal Combustion	Mitsubishi Nainenki
Mitsubishi Iron	Mitsubishi Seitetsu
Mitsubishi Mining	Mitsubishi Kōzan
Mitsubishi Marine and Fire Insurance	Mitsubishi Kaijō Kazai Hoken
Mitsubishi Oil	Mitsubishi Sekiyu
Mitsubishi Paper	Mitsubishi Seishi
Mitsubishi Shipyards	Mitsubishi Zōsenjo
Mitsubishi Steel	Mitsubishi Seikō
Mitsubishi Trading	Mitsubishi Shōkai
Mitsubishi Trust	Mitsubishi Shintaku

Mitsui Bank	Mitsui Ginkō
Mitsui Chemical Industries	Mitsui Kagaku Kōgyō
Mitsui Construction	Mitsui Kensetsu
Mitsui Life Insurance	Mitsui Seimei
Mitsui Machinery	Mitsui Kikai Kōgyō
Mitsui Mining	Mitsui Kōzan
Mitsui Shipyards	Mitsui Zōsen
Mitsui Trust	Mitsui Shintaku
Mitsui Warehousing	Mitsui Sōko
Moji Bank	Moji Ginkō
Mori Combine	Mori Kontsuerun
Moroto Industries	Moroto Shokusan
Murai Bank	Murai Ginkō
Nagano Electric Light	Nagano Dentō
Nagasaki Shipyards	Nagasaki Zōsenjo
Nagasaki Weaving	Nagasaki Bōshiki
Nagashi Plant	Nagashi Seisakusho
Nagashi Textiles	Nagashi Seni
Nagoya Technical College	Nagoya Kōtō Kōgyō Gakkō
Naigai Cotton	Naigai Men
Nakai Bank	Nakai Ginkō
Nakamura Trading	Nakamura Shōten
Nakano Family	Nakano Dōzoku
Nakazawa Bank	Nakazawa Ginkō
New Japan Fire and Marine Insurance	Shinnihon Kazai Kaijō Hoken

New zaibatsu	Shinkō zaibatsu
Niigata Rayon	Niigata Jinken
Niigata Sulphuric Acid	Niigata Ryūsan
Nikka Weaving	Nikka Bōshiki
Nishiehara Bank	Nishiehara Ginkō
Nisshin Flour Mills	Nisshin Seifun
Nisshin Rayon	Nisshin Rēyon
Nisshin Spinning	Nisshin Bōseki
Nisshin Steamships	Nisshin Kisen
Nitchitsu (Combine)	Nitchitsu Kontsuerun
Nitrogen Discussion Council	Chisso Kyōgikai
Nittō Chemical Industries	Nittō Kagaku Kōgyō
Nittō Spinning	Nittō Bōseki
Number One Life Insurance	Dai-ichi Seimei
Number One Nitrogen Industries	Dai-ichi Chisso Kōgyō
October Plot (1931): an abortive plot involving the Sakurakai, other Army elements and right-wing civilian activists	Jūgatsu Jiken
Ōgawa Group	Ōgawa Kei
Ōhara Centre for the Study of Social Problems	Ōhara Shakai Mondai Kenkyūjo
Oji Paper	Oji Seishi
Oka Unlimited Partnership	Oka Gōmei Kaisha
Okimimoto Collieries	Okimimoto Tankō
Okioka Mine	Okioka Kōzan
Oligarchy	Genrō

One Hundred and Nineteenth Bank	Dai Hyaku Jukyū Ginkō
Opinion	Tenseijingo
Oriental Cotton Wool	Tōyō Menka
Oriental High Pressure	Tōyō Tōatsu
Oriental Marine and Fire Insurance	Tōyō Kaijō Kazai Hoken
Oriental Match	Tōyō Matchi
Oriental Nitrogen Industries	Tōyō Chisso Kōgyō
Oriental Nitrogen Union (ONU)	Tōyō Chisso Kumiai
Oriental Otis	Tōyō Ōchisu
Oriental Rayon	Tōyō Rēyon
Oriental Spinning	Tōyō Bōseki
Oriental Sugar Refining	Tōyō Seitō
Osaka Foundries	Ōsaka Tekkōsho
Osaka Imperial University (University of Osaka)	Ōsaka Teikoku Daigaku
Osaka Industrial School	Ōsaka Kōgyō Gakkō
Osaka Merchant Shipping	Ōsaka Shōsen
Osaka Technical College	Ōsaka Kōtō Kōgyō Gakkō
Osaka Trading	Ōsaka Shōji
Osaka United Spinning	Ōsaka Gōdō Bōseki
Otagawa Hydro-electric	Otagawa Suiden
Overseas Sugar Trading Association	Yōtō Shōkai
Peasant Movement	Nōmin Undō
Peasant Union	Nōmin Kumiai
Peoples' Rights Movement	Jiyū Minken Undō
Plum rains	Tsuyu

Privy Council Investigation Committee	Sūfu Seisa Iinkai
Railway Bureau	Tetsudōin
Refined Camphor	Saisei Shōnō
A Report of an Investigation into the Rayon Spinning Industry	Jinzō Kenshigyō no Chōsa Hōkoku
Rice Riots	Kome Sōdō
Rōka Warehousing	Rōka Sōko
Ryōyō Industries	Ryōyō Kōgyō
Saga Spinning	Saga Bōseki
Sakhalin Fish Industries	Karafuto Gyōgyō
Sanei Limited Partnership	Sanei Gōshi Kaisha
Sanwa Bank	Sanwa Ginkō
Sanyō Electric Railways	Sanyō Denki Kidō
Sanyō Hydroelectric	Sanyō Suiryoku Denki
Sanyō Ironworks	Sanyō Seitetsu
Senyō Bank	Senyō Ginkō
Shanghai Artificial Silk	Shanghai Seizō Kenshi
Shanghai Weaving	Shanghai Bōshiki
Shantung Agricultural	Santō Nōji
Shiba Park: a large park in south-central Tokyo	Shiba Kōen
Shibaura Engineering	Shibaura Seisakusho
Shiga Plant: located near Lake Biwa in Shiga Prefecture	Shiga Kōjo
Shinetsu Electric	Shinetsu Denryoku
Shinkō Rayon	Shinkō Jinken
Shinkō Wool Weaving	Shinkō Kesori

Shiomizu Harbour Sugar Refining	Shiomizu Wan Seitō
Shipbuilding Iron (Exchange) Agreement	Sensen (Kōkan) Kyōtei
Shōnaigawa Rayon	Shōnaigawa Rēyon
Shōwa Artificial Silk	Shōwa Jinken
Shōwa Fertilizers	Shōwa Hiryō
Shōwa Rayon	Shōwa Rēyon
Sixty-Fifth Bank	Dai Rokujūgo Ginkō
Sōda Bank	Sōda Ginkō
Soki Electric	Soki Denki
South-east Asia Sugar Refining	Nanyō Seitō
South Korean Paper Mills	Minami Chōsen Seishi
South Manchurian Railway Company	Minami Manshū Tetsudō
South Manchuria Trading	Minami Manshū Bussan
Special Nitrogen Research Station (SNRS)	Rinji Chisso Kenkyūjo
Special Police	Kōtō Keisatsu
Special Schools Ordinance	Senmon Gakkō Rei
Spinning Machine Manufacturing	Bōki Seizō
Sumitomo Bank	Sumitomo Ginkō
Sumitomo Fertilizer Plant	Sumitomo Hiryō Seizōsho
Sumitomo Steel Casting	Sumitomo Ikō
Sun Life	Taiyō Seimei
Sun Rayon	Taiyō Rēyon
Sun Soda	Taiyō Sōda
Taisei Chemicals	Taisei Kagaku
Taishō Life Insurance	Taishō Seimei

Taishō Marine and Fire Insurance	Taishō Kaijō Kazai
Taiwan Camphor and Camphor Oil Monopoly	Taiwan Shōnō Oyobi Shōnōyu Senbai
Taiwan Electric Power	Taiwan Denryoku
Taiwan Sugar	Taiwan Seitō
Takashima Coal Mine	Takashima Tankō
Takeda Discount Bank	Takeda Waribiki Ginkō
Taki Fertilizer Plant	Taki Seihisho
Tama Shipyard	Tama Zōsenjo
Tenman Woven Products	Tenman Shokubutsu
Thirty-Fourth Bank	Dai Sanjūyon Ginkō
Tōhoku Imperial University (University of Tōhoku)	Tōhoku Teikoku Daigaku
Tōka Spinning	Tōka Bōseki
Tōkai Oil Refinery	Tōkai Seiyusho
Tokushima Bank	Tokushima Ginkō
Tokushima Savings Bank	Tokushima Chochiku Ginkō
Tokuyama Soda	Tokuyama Sōda
Tokyo Artificial Fertilizers	Tōkyō Jinzō Hiryō
Tokyo Electric Light	Tōkyō Dentō
Tokyo Fertilizer Wholesalers Union	Tōkyō Hiryō Tonya Kumiai
Tokyo Gas Electric	Tōkyō Gasu Denki
Tokyo Imperial University (University of Tokyo)	Tōkyō Teikoku Daigaku
Tokyo Industrial Experimental Station (TIES)	Tōkyō Kōgyō Shikkenjo
Tokyo Leather	Tōkyō Rēza

Tokyo Leather Branch Factory: The Yonezawa Rayon Manufacturing Plant	Tōkyō Rēza Bunkōjo Yonezawa Jinzō Kenshi Seizōsho
Tokyo Marine and Fire	Tōkyō Kaijō Kazai
Tokyo Radio Electric	Tōkyō Musen Denki
Tokyo Rayon	Tōkyō Jinken
Tokyo School for Industrial Workers	Tōkyō Shokkō Gakkō
Tokyo Technical College	Tōkyō Kōtō Kōgyō Gakkō
Tokyo University of Engineering	Tōkyō Kōgyō Daigaku
Tokyo University of Literature and Science	Tōkyō Bunrika Daigaku
Tokyo Warehousing	Tōkyō Sōko
Tokyo Watanabe Bank	Tōkyō Watanabe Ginkō
Tokyo Wool Products	Tōkyō Mōshokubutsu
Tōpō Artificial Textiles	Tōpō Jinzō Seni
Tōshin Electric	Tōshin Denki
Tōshin Warehousing	Tōshin Sōko
Toyoshima Trading	Toyoshima Shōten
Toyota Spinning	Toyota Bōseki
Toyota-Type Looms	Toyota Shiki Shokki
Toyota Weaving	Toyota Bōshiki
Transcendental Cabinet: "A cabinet above party politics"—in reality a cabinet dominated by the oligarchs	Chōzen Naikaku
Ube Nitrogen Industries	Ube Chisso Kōgyō
Ueda Silk College	Ueda Kenshi Senmon Gakkō
Unfair Low Price Sales Tariff Law	Futō Renbai Kanzei Teiritsu Hō

Union Transport Company	Gōdō Unyū Kaisha
United Earthquake Bills Opposition Alliance	Gōdō Teishingata Hō Hantai Renmei
United Fats and Glycerine	Gōdō Yushi Guriserin
Uozumi Bank	Uozumi Ginkō
Uraiku Bank	Uraiku Ginkō
Wakasa Bank	Wakasa Ginkō
Waseda University	Waseda Daigaku
Watanabe Chemical Research Station	Watanabe Kagaku Kenkyūjo
Yaeyama Industries	Yaeyama Sangyō
Yaezan Industries	Yaezan Sangyō
Yahata (Yawata) Iron Works	Yahata Seitetsu
Yamaguchi Bank	Yamaguchi Ginkō
Yasaku Industries	Yasaku Kōgyō
Yasuda Bank	Yasuda Ginkō
Yokohama Group	Yokohama Kumi
Yokohama Group Secret Research Station	Yokohama-sha Mitsukenkyūjo
Yokohama Specie Bank	Yokohama Shōkin Ginkō
Yonezawa Technical College	Yonezawa Kōtō Kōgyō Gakkō
Yoshioka Copper Mine	Yoshioka Dōzan
Yokohama Technical College	Yokohama Kōtō Kōgyō Gakkō
Yokohama Watanabe Bank	Yokohama Watanabe Ginkō
Yoneboshi Tobacco	Yoneboshi Tokako