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JAPANESE WAR PRODUCTION INDUSTRIES

PART V

ORDNANCE

Description

Discussion of the Japanese Ordnance Industry; corporate structure and the history of governmental control receive the major emphasis. The capacity and technological aspects of this industry are also discussed.

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Page 323 last line: change "officer" to "offices"

Page 343 line 3: add "Council" after " Deliberative"

PART V. ORDNANCE

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APPENDIX V

V. ORDNANCE

A. Ordnance Production: Physical and Technical Aspects

Sometime in 1944 the high rating which ordnance had received under the Munitions Company Law of 1943 was dropped and it ceased to be considered a priority industry. The wastage of heavy weapons during 1944 had apparently been lower than expected, and their production was cut even more than that of light weapons.

Procurement figures for 1944, taken from a captured Japanese document, indicate a considerable drop in the production of most types of ordnance. Compared to the amount available to the Army in 1943, the allotment for weapons was 72 percent, for ammunition 43 percent, and for ordnance stores 85 percent. The production of other types of ordnance, including AA guns and electronic equipment, was to be increased.

Estimates have been made of the amounts of various types of equipment required by the Army and Navy, but these figures do not necessarily correspond to production, about which little is known.

1. Structure of the Industry. Japanese ordnance (guns, artillery, small arms, ammunition, and bombs of all categories) was produced in some twenty-five army and navy arsenals; in about ten large private munitions plants equipped in varying degrees with high-speed precision machine tools; and in hundreds of smal plants and workshops where the fabrication of component parts was carried on. The government arsenals were the most important producers; the relative importance of the two largest private ordnance concerns, the Nippon Seikosho (Japan Steel) and the Dai Nippon

Heiki (Great Japan Arms) was less than that of the arsenals. (See Appendices Va, b, and c and Map II for arsenals and private plants). The capacity and production of the arsenals and plants is not fully known; no line of production in Japan has been shrouded in greater secrecy than that of ordnance.

a. Arsenals. Arsenals in Japan not only produced, tested, and assembled ordnance, but they also controlled, through the branch Army and Navy Ordnance Headquarters established therein, the production of all munitions in private plants within the eight strategic munitions producing and supply districts into which Japan proper is divided.[1] The arsenals in turn were under the direct control of the Army and Navy ordnance departments in Tokyo. (See Chart I for recent changes.)

The percentage of the total munitions output actually produced or assembled in army and navy arsenals is impossible to estimate, but it may well be as high as 50 percent. As production units the arsenals were fairly well integrated. The largest arsenals, such as those at Yokosuka, Osaka, Kure, Hiroshima, and Kokura, were more than producers of special categories of ordnance. They made some of their own special steels, produced to some extent their own special purpose machine tools, had experimental and research establishments, and possessed resources and equipment needed for manufacturing the most modern ordnance. They took top place in the ordnance field, followed closely by a few private concerns such as Nippon Seikosho and Dai Nippon Heiki.

1. Since June 1945 the branch Army and Navy Ordnance Headquarters have been operating within the officer of the eight Superintendencies General.

the areas around Aomori, Sendai, Niigata, Tokyo, Yokohama, Nagoya, Kobe and Osaka, Hiroshima, Yawata, and Fukuoka in Japan proper; Seoul, Heijo, Keijo (Ping-Yang) and probably near Rashin in Korea; and Mukden, Anshan, and Antung in Manchuria.

After 1938 ordnance-producing plants were not built in the old metropolitan areas, and the equipment of some plants in congested locations was moved to other areas. New plant locations were chosen, under direction of the Army and Navy, for strategic reasons. The plan, as promulgated in 1938, was to give each regional bloc the greatest possible diversity of ordnance products, and to provide each with such a variety of facilities that its dependence on other areas for critical materials or components would be reduced to a minimum.

By January 1941 construction was already under way at the following areas; Ota (Gumma Prefecture), Sagamihara (Kanagawa Prefecture), Yokkaichi (Mie Prefecture), Hiro (Hyogo), and Sumani (Yamaguchi). The following cities were being developed: Hachinoe (Aomori), Sendai (Miyagi), Higashi-Iwase (Toyama), Taga (Ibaraki), Kawaguchi (Saitama), Toyokawa (Aichi), Kanda (Fukuoka), and Kasugano (Fukuoka).

3. Labor. About half a million persons are estimated to have been engaged in the production of ordnance (October 1944). A captured Japanese document gives a considerably higher figure. It states that slightly over one million persons were employed in six arsenals (Heijo [Korea], Tokyo, Okura, Osaka, Nagoya, and Mukden) and the 920 plants they controlled. (This figure, however, includes plants simultaneously producing other

products such as tanks and perhaps electrical equipment and machinery and, in general, is not given much credence.)

4. Technological Aspects. An indication of the early Japanese shortage of machine tools is to be found in her frantic purchasing both in the United States and Europe. The Japanese Army ordnance and aviation arsenals purchased more machine tools in the US between 1937 and 1940 than any one Japanese industrial company. (For example, the Japanese arsenal acquisitions were far greater than those of Nakajima Hikoki [Nakajima Aircraft Company], or of the whole group of Mitsubishi enterprises.)

Some lines of ordnance exhibit high quality workmanship and the use of automatic precision tools. Other categories indicate the lack of precision machinery and a resort to hand or simple tool finishing.

a. Machinery and Equipment. The machinery of an ordnance plant may be divided into three types: (1) Special purpose machinery (such as that used in bullet-assembly, powder loading, primer inserting, and visual inspection) which is not readily convertible to other uses; (2) special purpose machines (such as punch presses, spindle machines, heat-treating furnaces, wash-and-dry apparatus, and package-making equipment) which may be converted to other uses by changing tools and jigs; and (3) those general purpose machines which include allof the equipment to be found in the tool-and-gauge shop and in the maintenance department. These include lathes, grinders, drill presses, shapers, planers, milling machines, etc., and account for the great bulk of machine tools used in ordnance manufacture.

b. Time Required to Restore Ordnance Production

1. Arsenals. The Japanese arsenals, and perhaps a few of the private plants, were highly self-sufficient and well-integrated industrial plants, in some cases supplying their own raw materials, such as special steels and machine tools, in addition to making all the necessary components. In the event that such plants are dismantled, destroyed, or otherwise disposed of by Allied authorities, several years would necessarily elapse before such a complex industrial layout could be established again, even assuming that all other facilities and raw materials were available.

The administrative upset resulting from the dismantling of an arsenal would be more important than the physical loss of buildings and equipment. Arsenals in Japan served as centers of production, testing, and assembly in their respective arsenal regions, and their loss would, in general, disrupt production schedules in the region, retard the production of new types and models, and remove the central control over the flow of raw materials and the allocation of labor and machine tools.[1]

2. Private Munitions Plants. Complete dismantling of an average plant, formerly devoted to the production of ordnance, would probably mean a total loss of production for about six months. The time required to recover the normal rate of production would depend upon the availability of the necessary machinery and machine tools.

If the plants were to return to their pre-war occupation or to convert to the production of auto parts, stamped parts, hardware, small transformers, household appliances, etc., the time required to resume production

1. The activities of the army arsenals in this respect were restricted to land ordnance and motor vehicle production; naval arsenals to shipbuilding and naval ordnance.

would be even less.

5. Principal Raw Materials. Steel and copper are the two most important raw materials required in the production of ordnance. Zinc, used in making cartridge brass, is also a critical raw material.

a. Steel. Prior to the surrender of Japan, the lowest American estimate of Japanese steel production for 1944 was in the neighborhood of 4,500,000 metric tons. On the basis of this figure, 1,500,000 was considered a very low figure for steel allotted to ordnance production. Figures revealed by the Japanese Diet after the surrender give 2,000,000 tons as the total of 1944 production (or more than 100 percent less than the estimated amount), with another anticipated drop in 1945. In the light of this new information, even 1,500,000 metric tons would represent a figure out of line with the Japanese production and requirement picture. (See Chapter III, pp181 et seq.)

b. Copper. Some 70 percent of total estimated Japanese copper output of 114,000 metric tons in 1943 was produced in Japan proper. The remainder came from Formosa (one mine accounting for 8.8 percent); Manchuria 2.1 percent; and the Philippine Islands 10.5 percent. In 1943 it was estimated that 75,000 metric tons were required in the production of ammunition.

Equipped as Japan has been to treat imported ores, concentrates, and matte, the smelting and refinery capacity was in excess of the ore supply believed available. Three smelters treated 36 percent of the current supply, and five refineries treated 83 percent of the 1943 output.

(i) Stocks. It was estimated in 1943 that the copper stocks amounted to some 150,000 metric tons, or about a year's supply.

(ii) Uses in War and Peace. In 1943, of the 150,000 metric tons of copper estimated to have been required by Japan, it is believed that 50 percent went to ammunition; 20 percent to electric power transmission, communications, and related uses; 10 percent to marine uses; 10 percent to air and land transport; and 10 percent to other industrial needs. Japan is somewhat short of copper and, like Germany, is substituting steel for copper in certain types of munitions. In the five years before Pearl Harbor, Japan utilized about 41 percent of her copper in electric power generation and transmission, and about 6 percent in communications.

c. Zinc. Some 60,000 metric tons of zinc were available to Japan in 1943, of which about 46.1 percent was mined in Japan proper. Twenty-three percent came from Manchuria and 13.1 percent from Korea.

(i) Stocks. It is estimated that in 1943 Japan had 55,000 metric tons of zinc on hand.

(ii) Requirements. It is estimated that 70,000 metric tons of zinc were required by Japan. The largest use was, supposedly, for cartridge brass, which is believed to have taken 70 percent of the total. Other military and naval uses, including galvanized sheets, wet storage batteries, paints, electrical appliances, aircraft alloys, castings, tubes, and parts, etc., took 15 percent; other industrial uses, 13 percent; and civilian consumption, 2 percent.

B. Organization of Ordnance Production

1. Brief History. As the military clique in Japan gained in power and influence after the invasion of Manchuria, increasing emphasis was placed upon the production of ordnance. Years before, the Army and Navy had built arsenals throughout Japan, Korea, and the Kwangtung Territory of Manchuria, and thereby exercised close control over the production of ordnance, as well as all other armaments. Before 1937 virtually all ordnance was fabricated and assembled in the arsenals themselves. Since that time, however, private plants have been drawn into the production program.

2. Administration. Available intelligence does not entirely clarify various questions pertaining to the administration of ordnance production. Where current information is simply lacking, or of an incomplete nature, assumptions have been made on the basis of what is known about the administrative situation prior to the passing of The Munitions Company Law in October 1943. (See Appendix Ih for the provisions of this law.)

a. Army and Navy Ordnance Departments. Prior to October 1943 the Army and Navy Ordnance Headquarters in Tokyo, working within the over-all production program decided upon by the first Cabinet Planning Board, allocated production schedules to the ordnance headquarters in each of the nine old administrative blocs. These orders were presumably carried out by the arsenals,

and by those private plants under their supervision. It may be assumed that this system was continued after the passage of the Munitions Company Law, with the Army and Navy Ministry taking the place of the Cabinet Planning Board at the national level. Allocation of raw materials and orders on the regional level apparently was the function of the regional Superintendents-General. (See Chart I, Chapter I.)

b. Army and Navy Industrial Associations. In line with a general tendency for increase in power of control societies, introduced with Japan's "new economic structure," the Army and Navy Ordnance Departments surrendered increasing amounts of their jurisdictional authority over plants under contract to them to the Army and Navy Industrial Associations. The latter were composed of private plants under contract to the Army and Navy respectively, and functioned within their respective industrial spheres to allocate orders and raw materials, and in general to supervise production on behalf of the ministries. (See Chapter I, Chart I for the function of these associations.) The Aviation Industrial Association is a case in point.

(1) Army Ordnance Department. The Army Ordnance Department was established largely in its present form at the time of the general reorganization of the Army in 1940. Its establishment represented an attempt to centralize control over all ordnance production to an even greater degree than had been the case in the past. The Minister, General Hata, stated at the time that the new Ordnance Department

was to control and supervise the manufacture and repair of armaments and the supply of munitions to the troops. Similarly, on 15 October 1942, Lieutenant General KOSUDA Katsuzo, Chief of the Army Ordnance Department, explained that its function was to serve as the supreme administrative body concerned with army land weapons.

(ii) Navy Ordnance Department. The Navy has retained control over the production of naval ordnance. As is the case with the Army, the Navy probably administers the production of such ordnance through its arsenals and those private plants under contract to them.

3. Principal Producers

a. Arsenals

(i) Army Arsenals. The Army has 9 large arsenals, the largest of which, at Osaka, specializes in the manufacture of heavy army guns. It purchased in the United States, through Mitsubishi and Mitsui, large numbers of lathes, milling machines, grinders, threading machines, and heavy boring machines, and ordered several forging presses, hammers, and other heavy equipment. Osaka is the only major arsenal which did not make purchases tending to indicate the manufacture of either aircraft or other internal combustion engines. An indication of the scope of a government arsenal, and of its control over the private plants within its region, is seen in the fact that the Osaka arsenal has consolidated 12 plants, including the

Suzuki Seikosho (Suzuki Steel Works), and had 400 plants under its direct administration. Among these 400 were the Osaka Rasa Kogyo (Osaka Rasa Industry), Niho Sulfate (Japan Sulphate-- Okawa interests), and Toa Denki (Toa Electric-- Kuhara interests).

The Kokura Arsenal is, judging from its volume of purchases made in the United States, Germany, and Japan, the second largest of the Army Ordnance Arsenals. Another source states that the Kokura Army Arsenal is the most important Army arsenal for the manufacture of small arms, light automatic weapons, and the smaller types of AA and AT guns. Available evidence indicates that the arsenal does not manufacture heavy artillery or ordnance, at least not on any substantial scale. The volume of production is unknown, but may include several thousand machine guns of all types per month, and perhaps several hundred light tanks per year. Kokura, like other large arsenals, has its own foundry and machine shop. From the name found on shipping orders it is believed possible that this arsenal may have a branch at Jinsen in Korea. Orders for Kokura (Jinsen) were sent via Kobe, a leading transshipment point for goods destined for Korea. Kokura does not appear to have control over as many private plants as Osaka, but among the 140 plants under its direct control are the Asano Cement Works and the oil plant of Yawata Saitetsu (Yawata Iron Works).

The Tokyo Arsenal, third-largest in respect to orders placed

and goods shipped, specializes in the manufacture of rifles, revolvers, and machinery. Among the 232 plants under its direct administration were Tokyo Denki (Tokyo Electric) and Ikegai Tekkosho (Ikegai Iron Works).

The Nagoya Arsenal was the fourth-largest arsenal purchaser of machine tools in the United States. Among the plants which this arsenal formed into a productive combine were the Niigata Seikosho (Niigata Steel Works), Kutama Tekkosho (Kutama Metal Works), Nippon Kisha Rosha Seisakusho (Japan Rolling Stock Works), and the Taki Hiryo (Taki Fertilizer). The plants under its direct control include Kobe Gasu (Kobe Gas Works), Hodogaya Soda Kogyo (Hodogaya Soda Industry), Asahi Garasu (Asahi Glass), Kobe Kawasaki Zosha Jo, and Nagoya Chisa Kogyo.

The Mukden Arsenal was apparently engaged primarily in supplying ordnance and combat weapons to the large Kwantung Army garrisoned in Manchuria. Nothing is known which could indicate the rates of output for small arms, field artillery, ammunition for all types of guns made in the plant, and the tanks and possibly other combat or transport vehicles it was believed to produce, as well as some rolling stock. This arsenal has its own machine and metal fabricating shops. (See Appendix Va for additional details on these and other army arsenals.)

(ii) Navy Arsenals. In addition to ships and some aircraft, the navy arsenalswere large producers of ordnance (See Appendix Vb).

Kure, believed to be the largest and most important of the naval arsenals, produced several types of navy ordnance in addition to making and repairing warship armament.

Hiro, a branch of Kure, was principally a fabricator of naval guns, though it did produce some aero-engines and aircraft components.

Sasebo, believed to be the second largest navy arsenal, produced mines, torpedoes, and other naval ordnance as well as a few airframes.

Yokosuka, a well known research center, produced some aircraft components and engines (Wright Cyclone "G" type engine) as well as various types of naval ordnance.

b. Other Producers. Owing to the extreme secrecy in this field, its recent development, and the consequent paucity of evidence, it is impossible to judge what proportion of the ordnance produced outside of the army-navy arsenals is produced by any one particular private company. In the same way, with a few exceptions, there is little or no information on the ownership and corporate structure of these companies either in formal corporation handbooks or in current intelligence. Accordingly we have to fall back largely on a simple listing of companies, with their locations, and products wherever known. (See Appendix Vc for list of principal private munitions companies, their locations capitalizations, importance, products, and directors where known.) For the most part, these plants produced in addition to ordnance, other war goods such as iron and steel, machinery, machine tools, or aircraft components. Of the 200 or more private plants believed to have been engaged in the production of ordnance, and components thereof, only the 40-odd principal ones listed in Appendix Vc have been available for study at all; the few companies for which information was available were analyzed as carefully as possible to indicate their corporate relationships. Of these, only a few have yielded concrete results. Fortunately these include four of the five most important producing companies in the industry: Mitsubishi Jukogyo, Nippon Seikosho, Hitachi Seisakusho, and Dai Nippon Heiki.

6. Ownership and Corporate Structure of Private Plants.

(i) The Mitsubishi Jukogyo.

Mitsubishi Jukogyo, one of the principal subsidiaries of the family enterprise, Mitsubishi Sha, has been discussed above (Chapter II) in connection with aircraft. In addition to its other activities, itwas reported to be producing ordnance components as well as torpedoes and mines for the Navy.

(ii) Enshu Oriki (Enshu Textile Machinery Company).

Enshu Oriki is affiliated with Mitsubishi through its principal stockholder, Nisshin Boseki (Nisshin Cotton Spinning Co.), which is controlled by the Meiji Life Insurance Company, a Mitsubishi subsidiary.

(iii) Nippon Seitetsu (Japan Iron Works).

Primarily a government company, Nippon Seitetsu is one of the outstanding iron and steel companies in Japan. Of the 10,000,000 shares of stock, the Government, in the name of Okura Daijin (Finance Ministry), holds 5,683,900 shares. The next largest bloc of shares (354,000), the most held by any private concern, is owned by Mitsubishi. Mitsui, Sumitomo, and Kawasaki also have considerable holdings.

(iv) Toyowa Jukogyo (Toyowa Heavy Industry)

Toyowa Jukogyo, mentioned above in connection with aircraft formed through the amalgamation of Showa Jukogyo,-- owned jointly by Mitsubishi, Nakajima Hikoki, and Kawsaki Kokuki,-- and Toyoda Oriki, a Mitsui subsidiary.

(v) Toyo Denki Seizo (Toyo Electric Machinery Mfg. Company).

Toyo Denki Seizo has both Mitsubishi and Mangyo capital in it. Of its 100,000 shares, Tokyo Shibaura Denki, a Mitsui-controlled company, holds 6,322 shares, and Mitsubishi Denki (Electric) owns 4,410. Fuji Denki Seizo, related to Mitsubishi, owns 1,939 shares. Hitachi Seisakusho, a Mangyo subsidiary, with 5,894 shares of stock, is the third-largest single stockholder (Tokyo Shibaura Denki with 6,322 shares is the second largest).

(vi) Tokyo Shibaura Denki (Tokyo Shibaura Electric).

Tokyo Shibaura Denki, discussed above (in Chapter II) is an outstanding Mitsui subsidiary.

(vii) Nippon Seikosho (Japan Steel Works).

Nippon Seikosho, believed to be one of the two most importance ordnance companies, is mentioned in Chapter II among aircraft component producers. Of its 600,000 shares of stock, Mitsui Bussan, Mitsui Kozan, and Mitsui Seimei Hoken together own 111,950 shares. The largest bloc of stock, 200,000 shares, is held by Hokkaido Tanko Kisen, itself a direct subsidiary of Mitsui. Another 30,000. shares are owned by Mitsui's Tokyo Shibaura Denki.

(viii) Nippon Seiki (Japan Fine Machinery Co.), now Nippon Seiki, called Kurashiki Koku (Kurashiki Aircraft Co.), is a subsidiary of Kurashiki Boseki, now Kurashiki Kogyo (Kurashiki Industry). Kurashiki Kogyo is, in turn, a subsidiary of

Kurashiki Koku Kagaku (Kurashiki Aircraft Chemical -- formerly Kurashiki Kenshoku /Spinning/), a Sumitomo subsidiary. These name changes are indicative of a change in interest; these textile firms are now primarily engaged in various types of war work.

(ix) Hitachi Seisakusho (Hitachi Engineering Works). Hitachi Seisakusho has a substantial amount of Mangyo capital. Of Hitachi's 4,090,000 shares of stock, Mangyo owns the controlling block of 1,274,890 shares outright. Another indication of Mangyo control is to be found in the fact that AIKAWA Shizuka, President of Mangyo, was Chairman of Hitachi's Board of Directors.

(x) Nippon Kogyo (Japan Mining)

Nippon Kogyo, the largest gold and copper mining concern in Japan, also has Mangyo's AIKAWA Shizuka as President of the Board of Directors, and Mangyo holds almost 60 percent of its stock.

(xi) Nihon Seiko (Japan Precision Industry).

Nihon Seiko, mentioned in connection with aircraft as one of the two most important producers of bearings, is dominated by the Yasuda interests. In addition, one of the directors, KONDO Shizuro, is also a director of Dai Nippon Heiki.

(xii) Dai Nippon Heiki (Great Japan Arms). Dai Nippon Heiki believed to be one of the two most important ordnance firms in Japan. The Uraga Senkyo (Uraga Dock Co.) is the

principal stockholder, with 166,000 of the 600,000 shares, and TERASHIMA Ken is president of both firms. The Uraga Senkyo has been reported to be a Shibusawa interest, and its bank is the Shibusawa, Daiichi Ginko. The second most important stockholder in Dai Nippon Heiki is Yamashita Kisen, about which little information is available other than that the Yamashita family holds the controlling interest in it.

d. Summary. From the foregoing rough sample of twelve companies manufacturing various types of ordnance (including the two most important) it is found that: Mitsubishi either directly controls, or is intimately associated withfive;Mitsui controls two others; Sumitomo is closely related to the seventh; two are direct subsidiaries of the Mangyo; one is dominated by Yasuda; and,finally, the last company is a Shibusawa interest. In short, although any generalization from such sketchy evidence is dangerous, the pattern which was observed above in Chapters II, III, and IV seems to persist in ordnance too; the big family holding companies dominate nearly all branches of war production in Japan.

D. Research and Development

1. Government Policy. Once Japan could no longer freely study the newly developed military equipment of advanced nations as in the past, the Government stressed the importance of research. Only that investigation

and research which was conducted in accordance with national policywas permitted. To insure this the Government established a Federation of Investigation and Research Institutes, in December 1942. The chief purpose of this organization was to work toward obtaining the maximum use of Japanese fighting power with the minimum of manpower and materials. To this end all institutes engaged in research work were urged to collaborate closely to avoid duplication and waste. The Government supplied sufficient funds for this body to carry out all necessary work.

Further efforts at centralization were made under the Munitions Company Law of November 1943, which provided for a Science Bureau among the bureaus of the new Munitions Ministry.

By 1944 electronic ordnance, the development of which is based upon research, was listed, along with shipping and airfield construction materials, as priority ordnance. As the importance of research became increasingly apparent, the Government took steps to concentrate the Japanses scientific technique on the war effort.

2. Research Institutions.

a. Scientific Research Council (Gakujutsu Kenkyu Research Council, Kaigi). The Scientific/reorganized and expanded both in September 1944 and again in January 1945, became the central organ for the administration of technical matters for all Japan. The principal results of this reorganization are

as follows:" (1) Membership was increased from 400 to 700, and many experts, both military and civilian, and respresentatives of other research organizations were named to the Council. (2) The Council was made the liaison and controlling machinery for all scientific and technical associations in the promotion of scientific research. (3) The Nation was divided into seven districts with a branch of the council to be maintained at each Imperial University to coordinate research work among the organizations located in each district. (4) Seven departments of the council, four dealing with natural sciences and three with cultural science, were expanded to 16 departments, of which 13 were to deal with natural science. Each department was to be staffed with 200 research workers. (5) Civilian members and research associates of the Army and Navy Joint Technical Board were named members of the Research Mobilization Committee (Kenkyu Doin Iinkai) to accelerate the utilization of any new ideas or techniques from civilian to military fields. (6) Various governmental heads and bureau directors, whose duties were related to scientific research were named councilors."

This reorganization and expansion of the Council, according to a Domei broadcast of 16 January 1945, was expected to bring about further mobilization of research workers and effective application of research to industry for military purposes.

b. Scientific Technological Mobilization Deliberative Council (Kagaku Gijutsusha Doin Kyogikai). The Scientific Technological Mobilization Deliberative was established at the time of the January 1945 reorganization of the Scientific Research Council as a liaison council for closer collaboration among the affiliated government agencies. It was to be set up in the Munitions Ministry. The chief of the Total Mobilization Bureau of the Munitions Ministry was to be the president of the Council, and senior administrative officers of all affiliated government offices were to be appointed as council members.

c. Army-Navy Joint Technical Board (Rikukaigun Gijutsu Unyo Iinkai). The Army-Navy Joint Technical Board was set up under Premier Koiso in August 1944 as a liaison between Army and Navy experts.

d. War Research Board (Senji Kenkyuin). The members of the War Research Board, which was one of the bodies actually turning out new weapons, were selected from the best among both civilian and government technicians. There is no information as to what, if any, connection this board has with the army-navy arsenals, or with the Technical Department of the Army Ordnance Administration Headquarters.

e. Army-Navy Arsenals. All the principal army arsenals in Japan proper (see Appendix Va) have experimental laboratories, and the naval arsenals at Yokosuka, Hiro, and Sasebo are well known research centers.

The laboratories at the arsenals develop new models of weapons, as well as new signal equipment, fire control devices, miscellaneous field equipment, and electronic devices.

APPENDIX Va

PRINCIPAL JAPANESE ARMY ARSENALS (EXCLUDING AIR ARSENALS)

Arsenal	Location	Product
Osaka Army Arsenal		
Main Plant, and research laboratory	Osaka, Higashi-ku, Sugiyama-machi	Heavy artillery, 75-mm AA guns, artillery ammunition; included in the Sugiyama-machi factory are a gun plant, ammunition plant and a steel mill.
Hirakata plant	Osaka-fu, Kita Kawachi-gun, Hirakata-machi	Heavy artillery
Harima plant	Hyogo-ken, Kako-gun, Arai-mura	Unknown
Muroran Branch Office	Hokkaido, Muroran	
Kokura Army Arsenal		
Main Plant and research laboratory	Kokura, Ta-machi	Probably the most important arsenal in Japan for the manufacture of light automatic weapons and smaller types of AA and AT guns, some heavy artillery, possibly light tanks and/or armored cars, and equipment for mixing poison gas and loading gas shells; small storage area.
Hiroshima Branch Office	Hiroshima	
Yawata Branch Office	Yawata	

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Arsenal	Location	Product
Tokyo First Army Arsenal	Tokyo, Oji-ku, Shimojujo-machi	6.5 mm LMG's, 70 mm barrage mortars, fuzes, primers, gun sights, height finders, electrical accessories, small amounts of Army field radio communications equipment; extensive storage area
Main, or Jujo, plant, and research laboratory	Tokyo, Oji-ku, Shimojujo-machi	
Omiya plant	Saitama-ken, Omiya	Light tanks and tankettes
Kawagoe plant	Saitama-ken, Kawagoe	Unknown
Sendai plant	Miyagi-ken, Sendai	Unknown
Tokyo Second Army Arsenal		
Itabashi plant and research laboratory	Tokyo, Itabashi-ku, Itabashi-cho	Explosives, shell loading; extensive storage area
Tama plant	Tokyo, Minami-tama-gun, Inagi-mura	Powder, fuses, primers, artillery ammunition
Tadanouni plant	Hiroshima-ken, Toyoda-gun, Tadanouni-mura	Rifle barrels, gun tubes, high explosive fuses, primers, chemicals
Sakanoichi plant	Oita-ken, Sakanoichi	Unknown
Arao plant	Unlocated	
Sone plant	Unlocated	
Iwabana plant	Gumma-ken, Gumma-gun, Iwabana mura	
Uji plant	Kyoto-fu, Uji-gun, Uji-machi	

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Arsenal	Location	Product
Sagami Army Arsenal (under supervision of Tokyo Army Arsenal)		
Main plant and research laboratory	Kanagawa-ken, Koza-gun, Ono-mura	Principal repair and modification center for combat vehicles in Japan; artillery shells, wheel and pack equipment
Nagoya Army Arsenal		
Atsuta plant and research laboratory	Nagoya, Atsuta-ku, Rokuno-machi	Medium to heavy ordnance, flexible guns for aircraft, and shell cases; probably supplies aircraft engine components to the Mitsubishi Nagoya plants
Chigusa plant	Nagoya, Chigusa-ku, Chigusa-machi	Heavy ordnance and ammunition components, repair and servicing of damaged ordnance material; castings and forgings may be supplied to the other arsenal units
Toriimatsu plant	Aichi-ken, Higashi Kasugai-gun, Toriimatsu-mura	Ammunition, reported production of medium tanks and heavy field artillery; extensive storage area
Takagi plant	Aichi-ken, Komaki (just north of Nagoya)	Ammunition, extensive shell loading facilities; fairly new plant and still expanding
Sendano plant	Nagoya, Higashi-ku, Sendano-machi	
Kozo plant	Unlocated	

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Arsenal	Location	Product
Heijo Army Arsenal	Korea Heian Nando, Heijo	Small arms; big expansion in storage area
South Manchuria (Mukden) Army Arsenal	Manchuria Fengtien, Mukden	Complete line of field artillery to 150 mm or larger, AA guns, mortars, small arms, and automatic weapons; ammunition for this ordnance as well as land mines, bombs and grenades; tanks, possibly other combat vehicles and rolling stock
Jinsen Army Arsenal (Photo cover of strip between Heijo and Jinsen has so far failed to locate this arsenal)		

APPENDIX V b

NAVY ARSENALS

Arsenal	Location	Products
Yokosuka Navy Arsenal	Kanagawa-ken, Yokosuka	Shells, mines, torpedo-tubes; assembles turrets and gun mountings up to 16 inches; extensive storage area.
Toyokawa Naval Arsenal	Aichi-ken, Toyokawa	Ammunition; extensive storage area; machine guns and aircraft cannon, small AA guns, rifles
Kure Naval Arsenal	Hiroshima-ken, Kure	Heavy naval guns, naval vessels, ordnance, aircraft, heavy AA guns, propellants, torpedoes
Hiro Ordnance Plant (Branch of Kure Naval Arsenal)	Hiroshima-ken, Hiro (3 miles SE of Kure)	Heavy naval guns
Sasebo Naval Arsenal	Nagasaki-ken, Sasebo	Underwater munitions, naval vessels, ordnance, aircraft
Hikari-Nachi Naval Arsenal	Yamaguchi-ken, Hikari-machi (near Kudamatsu)	Unknown
Hiratsuko Naval (branch Arsenal of of Yokosuka Arsenal)	Kanagawa-ken, Hiratsuka (SW of Yokohama)	Ammunition; extensive storage area
Maizuru Naval Arsenal	Kyoto-ken, Maizuru	Naval mines; apparently an administrative center of the Japanese Navy, a supply and distribution center
Suzuka Naval Arsenal	Mie-ken, Suzuka (just S of Yokkaichi)	Unknown

APPENDIX Vc

PRINCIPAL PRIVATE MUNITIONS PLANTS

Company	Capitalization (¥ 1,000)	Location	Product	Personnel
Nippon Seikósho (Japan Steel Works)	30,000	Fuchu-machi, Kitatama-gun, Tokyo	Medium sized ordnance probably for aircraft assembled in the area.	Chrm: ISOMURA T. Pres: SUGI M. Mng.Dirs: ISHIZUKA K. MATSUDA Y. Dirs: NANJO K. HASEGAWA S. SAKANO T. VALENTINE, J.A.F.
		*Torokame-machi, Isago-ku, Yokohama	97-type 7.7 fixed machine guns for aircraft, and probably 75mm. model 88, 40-caliber anti-aircraft guns.	
		*Muroran	Ordnance Iron and Steel	
		*Hiroshima	Naval guns	
Dai Nippon Heiki KK (Great Japan Arms Co.)	60,000 (1943)	Aichi-ken, Toyohashi, Hanada-cho, Muro-aza	A new plant probably producing newer types of weapons including smaller anti-aircraft and anti-tank weapons.	Pres: TERASHIMA Ken Mng Dir : KONDO Shojiro Dirs: YAMASHITA Taro KANDA Senei NAKAMURA Fujizo HAGEMU Inspecs: AMAIZUMI Toyoro HORII, Yuzaburo
		*Tomioka plant, Kanazawa-machi, Isago-ku, Yokohama	Fixed and flexible 20 mm machine cannon for airplanes, 20mm fixed and flexible cannon, probably also now 50-caliber machine guns. Recently expanded. Precision tools.	

* One of the eight most important private munitions plants. (Strictly speaking four motor vehicle plants should also be included in this list of "most important" private munitions plants. These are Nissan Sidosha, Yokohama; Toyoda Tidosha, Koromo and Kariya; Nippon Sharyo, Nagoya; for details, see Chapt III.)

Appendix Vc (Continued)

RESTRICTED

Company	Capitalization (¥1,000)	Location	Product	Personnel
Nihon Seiko (trade mark NSK) (Japan Precsision Industry)	50,000 (1943)	Kawasaki Tokyo (2)	Ball and roller bearings, steel balls. Unknown ordnance.	Pres: TAKAHASHI Koreyoshi Mng.Dirs: TAKO Hidezo (Shuzo) YASUMATSU Toshio Dirs: YAMAGUCHI Takehiko KONDO Shizuro MIYAJI Kenji MIYAHARA Isao ENDO Jyuichi
Mitsubishi Jukogyo (Heavy Industry)	480,000 (1942)	Himeji, Hyogo-ken	Ordnance components; reported planning to establish a gun factory here.	Chrm: SHIBA Koshiro Mng Dirs: GOKO Kiyoshi MOTORA Shintaro HARA Kozo Dirs: TAMAI Kiosuke IWASAKI Koyata IWASAKI Hikoyata MIYOSHI Shigemichi OTANI Noboru ITO Tatsuzo IJIUIN Kiyohiko SASAMOTO Kikutaro MATSUI Koshiro USHIMARU Fukusaku WATANABE Naota Inspecs: KAWAI Genhachi TATO Takeo YAMAMURO Sobun MUTO Matsuji
(See Chapter II, Aircraft)		Nagoya	Ordnance parts	
		*Nagasaki	Torpedoes, and possibly mines for the navy.	
		*Urakami (near Nagasaki)	Torpedoes, large new plants	
		Kamata-ku Tokyo	Ordnance and/or ordnance parts	
Watanabe Tekko-sho (Watanabe Iron Works) (See Chapter II Aircraft)	30,000 (1943)	Naka-mura, Tsukushi-gun Fukuoka-ken Kurume(?) Sasebo(?)	Unknown ordnance construction machines, charcoal gas generators	Pres: WATANABE Fukuo Mng Dirs: HAYASHI Ryokichi NANRI Toshide TAGUCHI Ukichi Dirs: WATANABE Tokichi FUJI Kazuo SASAKI Shoji Inspecs: WATANABE Yoshiina MISHIMA Fujita NAKAGAWAJI Sadaji

*One of the eight most important private munitions plants.

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Appendix Vc (Continued)

Company	Capitalization (¥ 1,000)	Location	Product	Personnel
Toyawa Jukogyo (See Chapter II Aircraft)	15,000	Shinkawa, just outside of Nagoya Tanashi-machi Kitatana-gun Tokyo	Arms, machine tools	
Manshi Kosho (Manchuria Iron Works)		Manchuria : * Mukden	Gun pointing gears, gun carriages, rolling stock	
Tokyo Shibaura Denki (Electric)	311,000 (1944)	Kawasaki (5) Yokohama Shinagawa-ku, Tokyo Asahi-mura, Mie-gun, Mie-ken Nishi Yodogawa-ku, Osaka Tanaka-mura, Takaka-gun, Shizoka-ken Kawaguchi, Saitama-ken Kokura	Generators; transformers; switchboards; el.loco-tives; other electrical machinery and instru-ments. Unknown ord-nance.	Pres: YAMAGUCHI K V.Pres: PIERCE, H.U. Dirs: KUBO S TSUNORI T JAJIMA S ASABUKI T KANEKO K KOBAYASHI K SHIMIZU Y SHINKAI K PRUESSMANN,O HYAKUDA T MORIMURA I
Hitachi Kokuki (Hitachi Arr-craft)	30,000 (1843)	Tokyo (3) Kawasaki	Aircraft engines and fuselages, parts; cast metals. Unknown ordnance	See under Tokyo Gasu Denki for Board of Parent Hitachi Co., SEISAKUSHO Hitachi. There is no information on personnel of this subsidiary
Hitachi Seisakusho		Tokyo, * Kameari plant	Ordnance	
Riken Jukogyo (Heavy Industry)	70,000 (1940)	Kashiwasaki-machi, Kariha-gun, Niigata-ken Kakizaki-machi Naka Kubiki-gun, Niigata-ken. Ojiya-machi, Kita Uonuma-gun, Niigata-ken	Machines tools and piston rings. Piston rings.	Pres: OKOCHI Masatoshi Mng Dir :SADAHIRO Shigenobu Dirs: ARAKI Shigeyoshi HOSHINO Kazuya NAKAGAWA Masasuke HAYASHIBE Kenichiro YABE Matakichi YUTOMI Jun UMINO Yukuyasu KURODA Taizo OTSUKA Banjo

* One of the eight most private munitions plants.

Appendix Vc (Continued)

Company	Capitalization (¥ 1,000)	Location	Product	Personnel
Riken Jukogyo (Heavy Industry Cont'd)		Tokyo (3) Maebashi, Gumma-ken Kumagaya, Saitama-ken Kokura	New plant "for special purpose"	Dirs: SATO Mashashiro HORI Naomasa Inspecs: SAIGO Yoshio NISHIKAWA Yaeji
Tokyo Nakajima Denki (Electric)	1,500 (1939)	Horikawa-cho Kawasaki	Aircraft electric machinery elec.parts.	Same directors as parent Co., Nakajima Hikoki (Airplane), Pres: NAKAJIMA Kiyoichi and Kimihei Dirs: SASAKI Kakuji NAKAMURA Yushin SAKUMA Ichiro NUMAZU Takeshi
Nippon Chisso Kayaku (Japan Nitrogen Gunpowder Co.)	7,000 (1939)	Kokura Fukuoka-shi Shinosaki, and Saienjo, both in Fukuoka-ken Nobeoka, Miyazaki-ken	Gunpowder, fuses, electric mines, etc.	Pres: NOGUCHI Jun Mng Dir : MIYAMOTO Hasaji Dirs: ICHIKASA Seiji ENAMI Naosaburo MIYAKONO (?) Masaichi Inspecs: IIJIMA Sadao
Nippon Seitetsu (Japan Iron Mfg.Co.)	500,000 (1940)	Yawata Muroran (Wanishi works) Kamaishi Iwate-ken Kawasaki Osaka Hiro-mura, Shikama-gun, Hyogo-ken (Hiroshata works) Wakamatsu	Pig Iron: steel; steel plate; by-products. Unknown ordnance Possibly produces latest gun types of Oerlikon and anti-aircraft	Chrmn: HIRAO Hachisaburo Pres: NAKAMATSU Sanezato Mng Dirs: KAGEYAMA Mitoshi SHIBUSAWA Masao IIDA Kusuo WATANABE Gisuke Dirs: INOUYE Takashiro YONEYAMA Tatsuo YOSHIDA Toyohiko MATSUDA Teijiro MATSUMOTO Kenjiro ARASHIRO Jiro OGATA Jiro FUKUDA Tsuneo HASHIMOTO Yoshio TAJIRI Seigo KITAMURA Yasutaro Inspecs: HARA Kunimichi KABAYAMA Aisuke ITANI Masasuke KOKURA Masatsune

Appendix Vc (Continued)

Company	Capitalization (¥ 1,000)	Location	Product	Personnel
Kobe Seikosho (Kobe Steel Mfg.Co.)	182,700 (1943)	Kobe (3)	Arms, aircraft engines, and parts.	Pres: TAMIYA Kaemon Mmg Dirs: MORI Motojinichi ASADA Chohei TSUCHIYA Yukizo Dirs: ODAJIMA Shujo WADA Nobufusa KAWAKAMI Yoshihiro MINAMI Kusuzo TAKAHATA Seiichi TAGO Tomihiko MORIDANI Hichinoshin TAKAHASHI Ryoji Inspecs: SOGA Sukekuni SASAKI Yoshihiko KAWASAKI Hajimu INOUYE Yuzo
		Wakamatsu	Possibly produces latest types of Oerlikon and anti-aircraft guns.	
		Moji Nagoya	Light metals magnesium products.	
		Toba-machi Mie-ken	Aircraft engines, elect.textile machinery,other elect.appliances.	
		Shimonoseki	Light metal alloys. Rolling stock; mining machinery; steel balls,shapes, and other products.	
Showa Tekko-sho (Iron Works)		Hakosaki, just outside of Fukuoka-shi	Radiators, boilers, arms.	
Ohtani Seikosho (Steel Mfg.)	25,000	Amagasaki	Possibley rough finishing large gun tubes.	
		Osaka	Iron and Steel.	
		Tokyo	Iron and Steel.	
Enshu Oriki (Enshu Textile Machinery Co.)	2,400 (1943)	Takatsuka-machi, Shizuoka-ken.	Lathes and other machinery. Unknown ordnance.	Pres: SAKAMOTO Kyugoro Dirs: NANGO Saburo SUMIDA Masataki Inspecs: MIYAJIMA Seijiro MASUI Jirosaku

Appendix Vc (Continued)

Company	Capitalization (¥ 1,000)	Location	Product	Personnel
Koban Kogyo (Koban Industry)	6,000	Kawasahi	Auto and aircraft parts, plates for rolling stock and ships, misc.ordnance	Mng Dir: CHO G Dirs: HIBURO H IGUCHI S TAKASHI J
Tokyo Koku Keiki KK (Tokyo Aircraft Co.)	3,000 (1939)	Kawasaki Kita Tama-gun, Tokyo Haneda, Kamata-ku, Tokyo	Airplane instruments; machine appliances; unknown ordnance	
Nippon Kogyo (Japan Mining Co.)	497,000 (1940)	Kawasaki	Unknown ordnance. Mining light metals and coal, chemicals, oil, among its interests	Chrm: AIKAWA Gisuke Pres: ITO Bunkichi Mng Dirs: IMAI Kiyoshi SUZUKI Tomiji Dirs: ADACHI Fusajiko KUBOTA Siejiro KOEMIYA Asataro MIKE Kikujiro IZAHAYA Ryozo TANBA Sakakichi YAMAGATA Goichi YAMASHIRO Yasushi Inspecs: KATAYAMA Yoshikat YAMADA Toshisuke SHIMOKAWABE Kenji TAMAGAWA Hisao
Tokyo Tankosho (Smithy, or Forge Shop)	5,000 (1940)	Shinagawa-ku, Tokyo Kawasaki	Airplane parts, various types of special steel forged items, marine and RR engines. Unknown ordnance.	Pres: NAMBA Matasaburo Mng Dir: IKEDA Kiyzo Dirs: IKEGAI Shotaro YAMAGUCHI Katsueo IKEGAI Sugigi Inspecs: HOSHINO Domojiro TSUCHIYA Keisayu
Nippon Denpa Kikai KK (Electric-Wave Machinery Co.)	3,000 (1940)	Shibuya-ku Tokyo Tsurumi-ku, Yokohama (4 plants here)	Weapons, parts, communication equipment, and other parts and equipment for the Army	Pres: HIRASAKA Hidenori Mng Dirs: USUKURA Masatar INOUYE Tatsurok Dirs: FUJIKI Yoshitaro WATANABE Masaaki SATO Keizo IBA Naohito SEJIMA Tsuneaki Inspecs: HAYASHI Haruo SUZUKI Shuji

Appendix Vc (Continued)

Company	Capitalization (¥ 1,000)	Location	Product	Personnel
Tokyo Denki Seizo (Electric Machinery Mfg.Co.)	5,000 (1940)	Yokohama	Unknown ordnance	Pres: KADONO Ryozo Mng Dirs: MITYOSHI Toji SHODA Heizo Dirs: ISAKA Takashi YAMAWAKI Masakichi TAKE Tsurujiro UGAI Yasuzaburo SUGISHITA Naruo Inspecs: KONDO Kenji TANIGUCHI Morio WATANABE Tetsuji
Tachikawa Kikai Seisakusho (Tachikawa Machinery Mfg.Works)	150 (1936)	Tachikawa, Tokyo	Aircraft parts. Unknown ordnance.	Representative: ISHIDA Kichizo
Nippon Seiki (Japan Fine Machinery Co.)	3,600 (1945)	Kamata-ku Tokyo Nishi-ku Osaka	Arms, radio receiving set., elect. appliances, machinery.	Chrmn: TOKUDA Kohei Pres: AOYANAGI Kinichi Dirs: ONO Renzo FUKUSHIMA Shigetomi SEKIOKA Hajime TAGUCHI Taichiro YAZAKI Shisaburo IMAI Hisayoshi Inspecs; KOBAYASHI Naka KAWANISHI Heisuke
Shawa Sheisakusho (Showa Engineering Co.) (Not to be confused with Showa Seikosho) (Reported to have been absorbed by Chuo Kogyo).	100 (1939)	Kyobashi-ku Yokohama	Unknown ordnance	Pres: TAMURA Seiji Dirs: AKIYAMA Kinosuke MATSUMOTO Karukichi TAMURA Unokichi

Appendix Vc (Continued)

RESTRICTED

Company	Capitalization (¥ 1,000)	Location	Product	Personnel
Tokyo Gasu Denki (Tokyo Gas and Electric) (Absorbed by the Hitachi interests before 1940)	6,000 (1935) -----358,000	Shinagawa-ku, Tokyo	Reported to be producing machine guns and other light ordnance	Chrmn: AIKAWA Gisuke Pres: KODAIRA Namirei V.Pres: TAKAO Naosaburo Mng Dirs: BABA Kumeo AKITA Masaichi Dirs: ROKKAKU Saburo YAMASHITA Koke SHIMOKOBE Kenji MORISHIMA Sadaichi YOKOTA Chiaki ONIWA Manpei IKEDA Ryoji HORIOKA Riichi ITO Fumitoshi Inspecs: YAMADA Keisuke KIMURA Yuji TAMAGAWA Hisao
Teikoku Kakohin Seizo KK (Teikoku Munition Mfg.Co.)	1,500 (1940)	Fukuoka-mura, Saitama-ken Shiba-ku, Tokyo	Unknown ordnance	Pres: KATSUNO Seigyo Dirs: SAKAKIDA Keizo SEITARO SETO Tokitono Inspecs: HAYASHI Unosuke KOIKE Shuzo
Chuo Kogyo KK (Chuo Industry) (Reported to have absorbed Showa Seisakusho)	10,000 (1940)	Fukuoka-mura, Saitama-ken	Unknown ordnance	Pres: MINAKAWA Tasaburo Dirs: KADONO Kujyuro OKURA Hikoichiro SUZUKI Momoichi ONDA Sadashiro TASHIRO Heiichi ITO Yoshio WATANABE Eikichi KAWAKAMI Hisashi Inspecs: TAKEDA Masami HAYAMIZU Kojiro

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Appendix Vc (Continued)

Company	Capitalization (¥ 1,000)	Location	Product	Personnel
Showa Kayoku (Showa Gun-powder Co.)	2,000 (1934)	Okitsu-machi Isumigun, Chiba-ken	Industrial explosives, perchlorate explosives. Unknown ordnance	Pres: MORI Nobutero Dirs: SANO Seiichi MORI Akatsuki IWASE Akira SAITO Isao ISHIDA Tadashige KODAMA Yoshio HAMANO Saichiro MOROZUMI Tabun YAUNISHI Naoichi
Ishikawa Seisaku KK (Ishikawa Engineering Works Co.)	1,600 (1940)	Morimoto-mura, Kahoku-gun, Ishikawa-ken	Unknown ordnance	Pres: IMURA Koki (?) Mng Dir: NAOYAMA Tomoji Dirs: SAKAI Munekichi MONDA Suguru KAWABATA Tsuneji SAMUKAWA Morihei INOUYE Tomizo Inspecs: MORITA Shigesaku HATEKAYAMA Yosak HASHIURA Hikozo
Tsuda Koma Kogyo (Tsuda Koma Industry)	6,000 (1943)	Kanazawa, Ishikawa-ken	Unknown ordnance. Precision machinery, lathes	Pres: TSUDA Komajiro Mng Dir: KOESA Tokuji SADANI Zensaku KITSU? Bunpei Dirs: SAKAI Ishiro KISHI Kahachiro IMURA Tokuji HAMANO Shigezo FUKUMASU Yonekichi WAKAHARA Yosaku Inspecs: KUBOTA Kazen ARAI Yoshimatsu
Nitto Kakohin Seizosho		Kokura	Detonators or blasting caps, fuses. Unknown ordnance	
Nippon Kayaku Seizo (Nippon Gun-powder Mfg. Co.)	10,000 (1940)	Honami-mura Kaho-gun, Fukuoka-ken Fukuoka-shi Wakamatsu Kokura Himeji Osaka Tokyo	Unknown ordnance Chemicals Explosives	Pres: HARA Yasusaburo Dirs: SEKIDO Toyota NAGASAKI Hidezo MINOWA Yukisaburo IIMORI Umeo OGURA Reizo Inspecs: OKANO Teiji KUDO Kinzaburo KUWADA Yukikasu

Appendix Vc (Continued)

Company	Capitalization (¥ 1,000)	Location	Product	Personnel
Tomioka Shisho		Kurume	Unidentified explosives Unknown ordnance	
Konan Koku Kogyo		Kobe	Unknown ordnance	
Nitto Tank-osho		Sonoda-mura, Kawabe-gun Hyogo-ken	Unknown ordnance	
Nippon Tanko (Japan Smithy)	30,000 (1943)	Kamisaki factory, Nishi Yodogawa-ku Osaka Onga Shima factory, Osho-ku, Osaka Kawasaki	Airplane parts, forged steel products for use in shipbuilding and RR Equip, milit. machinery	Pres: SHIBAYANAGI Shinji Mng Dirs: SUMIDA Noboru KUBOTA Shizuichi MORI Akatsuki KATO Takeshi KAMISHIMA Yonetaro IWATA Seizo Inspecs: IMAI Shiro YAMASHITA Taro
Osaka Seisa Zoki KK (Osaka Chain & Machinery Co.) (Reported to have become the Osaka Seisa Zoki Mizogouchi Gear Works, either through amalgamation or affiliation with the Mizogouchi Higaruma Kojo sometime after 1939)	20,000 (1943)	Konohana-ku Osaka (3 plants) Kasuga-mura, Osaka (2 plants) Nishi Yodogawa-ku, Osaka Yokohama	Cranes, conveyers, construction machinery, chains, anchors, trans. equipment. Unknown ordnance	Pres: TERADA Jinkichi Mng dirs: WASHIO Kozo NOGUCHI Shigeta HATANO Yujiro MIZOGUCHI Ryokichi Dirs: MAEKAWA Shintaro SHIRANE Takesuke Inspecs: YAMADA Mnesabu YABA Yasujiro SUZUKI Kotaro
Osaka Kiko (Osaka Mechanical Industrial Works)	12,000 (1940)	Itami-machi, Kawabe-gun Hyogo-ken Yokogawa-ku, Osaka (2 plants)	Construction machinery, diesel engines, lathes. Unknown ordnance	Pres: HARA Seimei Dirs: WATANABE Setsu KIMURA Teizo TSUCHIYA Fumimaru HOSHIZUMI Shikajiro Inspecs: NORITA Ryuhei MORII Shunzo

APPENDIX V d

PRINCIPAL JAPANESE ARMY SUPPLY DEPOTS

Depot	Location	Items Handled
Tokyo	Tokyo Itabashi-ku Shimizu-machi	Electric detonating apparatus, oxygen breathing apparatus, mine detectors, compasses, signal material, meteorologic equipment, special intelligence equipment, and various gauges.
Tokyo branch	Oji-ku Akabane, 5 of 1419	
Chiba	Chiba-ken Chiba	Gas detectors, fluid removing equipment, diving apparatus, RR material, well const. and water supply materiel, balloon material, searchlights, air compressors and tanks, generators, elect. motors, constr. machine tools.
Nagoya	Nagoya Higashi-ku Kita Chigusa-machi	Unknown
Osaka	Osaka Higashi-ku Baba-machi	Elect. detonating apparatus, time igniters, oxygen breathing apparatus, elect. circuit tester, RR material, well constr. material, air compressors, air tanks, generators, elect. motors, constr. machine tools.
Okayama	Okayama Okayama-ku	Unknown
Hiroshima	Hiroshima Kasumi-machi	Elect. detonating apparatus, time igniters, elect. circuit tester, direction indicators, signal material, constr. machine tools.

APPENDIX V d

Depot	Location	Items Handled
Kokura	Kokura Oaza Mihagino	Unknown
Heijo	Heijo (Korea)	Elect. detonating apparatus, time igniters, elect. circuit testers, air compressors, air tanks, generators, elect. motors, gauges.
South Manchuria	Mukden	Elect. detonating appartus, time igniters, elect. circuit tester, detectors, signal material, compasses, RR material, well constr. air compressors, tanks; generator, elect. motors, gauges, constr. machine.

Appendix V e

KNOWN OR ASSUMED SHELL AND CARTRIDGE FILLING PLANTS

COMPANY	LOCATION	PRODUCTS
Okuda Kakohin Seizo Sho	Fukuoka-Ken, Kasuya-gun, Shime-mura	Arsenal and munition plant -- electric percussion caps.
Nippon Chisso Kayaku	Fukuoka-Ken, Kojura, Shinosaki and Saienjo	Detonators and fuses.
Nippon Chisso Kayaku K.K.	Nobeoka (Miyazaki-Ken	Arsenal and munition plant -- dynamite.
Nippon Kayaku Seizo	Fukuoka, Kaho-gun, Honami-mura	Detonators.
Nippon Kayaku Seizo	Fukuoka, Wakamatsu, Orio	Tetryl and detonators.
Nippon Kayaku Seizo KK	Fukuoka, Kokura, (Itahitsu)	Arsenal and munition plant -- fuses.
Nippon Kayaku Seizo	Saga-Ken, Niyaki-gun, Kiyama-mura	Detonators and fuses.
Nippon Kayaku Seizo KK	Fukuoka-ken, Tatara (Aza-gun near Fukuoka city)	Arsenal and munition plant -- electric percussion caps.
Nippon Kayaku Seize KK	Tokyo	Arsenal and munition plant -- fuses and black powder.
Nippon Kayaku Seizo KK Nisshinsha	Osaka-fu(Kusune-machi)	Arsenal and munition plant -- fuses, detonators, blasting caps.
Nippon Kayaku Seizo	Hyogo-ken, Shikama-gun, Shigo-mura	Black powder and detonators.
Nippon Kayaku Seizo	Hyogo-ken, Arima-gun, Toyotomi-mura	Black powder and detonators.
Nippon Kayaku Seizo KK	Himeji (Hyogo) at Nibuno-machi, outside of the city	Arsenal and munition plant -- electric percussion caps.

Source: GOA

Table continued.

COMPANY	LOCATION	PRODUCTS
Nippon Kayaku Seizo	Hokkaido, Sorachi-gun, Iwamizawa-machi	Detonators and unidentified explosives. Two other such plants planned in Hokkaido in 1942.
Tomioka Shisho Seizosho	Fukuoka, Kurume	Unknown "explosives"
Kokko Kayaku Kogyo	Fukuoka, Kurate-gun, Ueki-machi	Fuses.
Tokyo Kayaku Seizo Goshi Kaisha	Fukuoka, Chijujo-gun, Suda-mura	Detonators.
Nitto Kakohin Seizo Sho	Fukuoka, Kokura	Arsenal and munition plant -- fuses and percussion caps.
Karatsu Kakohin Seizo Sho	Karatsu (Saga-ken)	Arsenal and munition plant -- electric percussion caps.
Tokyo Kayaku Kogyo	Tokyo, Itabashi-ku	Black-powder, detonators, and fuses. The Army's explosives arsenal also located here producing propellants and fuses.
Showa Kayaku KK	Okitsu-ken (Chiba)	Arsenal and munition plant -- perchloric explosives.
Teikoku Kakohin	Saitama-ken, Kitaadachi-gun, Fukuoka-mura	Detonators.
Furukawa Denki Kogyo	Tochigi-ken, Kamitsuga-gun, Nikko-cho	Detonators, brass cartridge cases
Kanto Dokasen Seizo-sho	Takesaki (Gumma-ken)	Arsenal and munition plant -- fuses.
Yamashiro Kayaku Seizo	Kyoto-ken	Arsenal and munition plant -- perchloric explosives.
	Kyoto-ken, Kasa-gun, Higashimaizuru-machi	Navy high explosive arsenal

Table continued.

COMPANY	LOCATION	PRODUCTS
	Hiroshima-ken, Toyodo-gun, Tadanoumi-machi	Tadanoumi army explosives arsenal
	Mie-ken, (near Tsu)	Unknown (probably shell-filling plant).
Chosen Chisso Kayaku	Korea, Kokai-Do, Shariin (Southeast of)	Perchlorate type explosives, detonators, fuses.
Chosen Chisso Kayaku	Korea, Kankyo-nan-Do, Konan	Ammonium nitrate, industrial explosives, black powder, detonator or blasting caps, fuses.
Fushin Branch of Mukden Arsenal	Chinchow, Fuhsin	Probably shell-filling.
Nanman Kayaku Seizo	Kuantung, Dairen	
Mukden Arsenal	Fengtien, Mukden	
Antung Branch Mukden Arsenal	Antung	