

V. Characteristic differences.

Under the law of munitions companies, the designated companies became munitions companies that must be operated under the orders of the Government and the production responsibility is assigned to the presidents of the different companies. Superintendent officials are sent to the actual places of operation, factories and plants, to give all possible means of encouragement, direction and guidance in production. Naturally the factory or plant owners have their own production responsibilities but when the superintendent officials express strong opinions as to how production should be or what management should be, dissensions may occur. However, it is fortunate that dissensions do not exist at all in the factories and plants because the fundamental principle of production-first lies deeper in the minds of producers and superintendent officials. The one goal is the same because the supreme order comes from the Ministry of Munitions.

Second, problems relative to the Superintendence Bureaus and local administrations cannot be denied. A local factory that belongs to a local administration must also belong to the administration of Superintendence Bureaus which would create a double responsibility for a local factory. But the presence of Superintendence officials in the local factories, cements the relationship and results in inseparable connections between local and central administration. The Superintendence Bureaus Chief represents all local administrations at conferences so that the direction and supervision of superintendent officials in localities will bring a closer connection between the central and local administrations. Here again, the most significant point of munitions production comes under the principle of "The nation itself is the munitions production." The logical differences are not the real problems.

Third, the problems relative to the Army and Navy controlled factories and the supervision of the superintendent officials are brought up. Logically there will be difficulty in the double supervision by both over the one aim of production. But in reality, the arrangement of Superintendence Bureaus for production is done by the same officials of the Army and Navy Ministries. These officials are the same officials of both the Superintendence Bureau and of the Army and Navy.

SOURCE: - Diamond June 11, 1944.

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APPENDIX V

MAJOR INDUSTRIES ORGANIZATION ORDINANCE 1/
Juyo Sangyo Dentai Rei)
(August 29, 1941)

CHAPTER I: General Rules

Article 1 --

This ordinance provides for the control of organizations established for the purpose of controlling major industries. The kinds of major industries (subject to this ordinance) are cited in Article 18 of the National General Mobilization Law, (including those industries referred to in Imperial Ordinance No. 317 of 1938). Exceptions will be made for the enterprises for which separate provisions are to be established.

Article 2 --

A Cabinet decree shall determine which major industries are subject to this ordinance.

Article 3 --

The organizations established under the provisions of this ordinance are called Control Societies (Tosei-Kai) and Control Associations (Tosei-Kumiai).

Any Control Society or Control Association, in designating its title, shall use the characters for Control Society () or Control Association (). An exception (as to the use of the character) may be made when the permission of the competent Minister is obtained.

CHAPTER II: Control Society (Tosei-Kai)

Article 4 --

For the purpose of developing the national economic power to the highest point the Control Society shall aim at promoting the control and management of industry concerned; and the society shall cooperate in carrying out national policy and the operation of the industry concerned on national lines, according to the national policy.

1/ The name of this Ordinance is alternatively translated as Key Industries Organization Control Ordinance.

Article 5 --

The control societies are to be established by kind of industry.

Article 6 --

In order to accomplish the purpose (for which they are established) the control societies shall perform the following functions:

- (a) Plan with the government the national program for production and distribution in the industry concerned; the means of supplying the labor, raw materials, capital and any other demands of the industry concerned.
- (b) Control and guide production and distribution in the industry concerned. Do the same for any enterprises belonging to the industry concerned, which are undertaken by the members and organizers of member organizations of the society.
- (c) Provide for the complete equipping of the industry concerned.
- (d) Develop techniques, increase the efficiency, unify the techniques of production, reform the management of the industry concerned and of the institutions undertaken by the members and the organizers of the member organizations for the development of the enterprises belonging to the industry concerned.
- (e) Make investigation of and do research work for the industry concerned.
- (f) Make investigations of the enterprises undertaken by the members and organizers of the member organizations of the industry concerned.
- (g) Carry on the enterprises required for the accomplishment of the purpose of the Control Society besides those mentioned above.

Article 7 --

Those who are qualified to be members of a Control Society and are subject to appointment by the competent Minister are as follows:

- (a) Those who are engaged in the industry concerned.
- (b) Organizations established by those who are engaged in the industry concerned.

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- (c) Organizations composed of those members mentioned in Section (a), and organizations composed of the organizations mentioned in Section (b).

Article 8 --

When the competent Minister intends to establish a control society he shall order those who have the qualifications for membership, as provided in the preceding article, to organize a control society in accordance with the provisions of a Cabinet decree.

When there is the order from the competent Minister to establish a control society in accordance with the provisions of the preceding paragraph, a general organizational meeting shall be called in accordance with the provisions of the Cabinet decree. After consideration of the Cabinet decree the meeting shall decide the articles of the society and the necessary matters to establish the control society. Approval of the society must then be obtained from the competent Minister.

Article 9 --

The following matters shall be written in the Articles of the control society.

- (a) Purpose.
- (b) Title.
- (c) Location of the office.
- (d) Regulations concerning members.
- (e) Regulations concerning officials.
- (f) Regulations concerning meetings.
- (g) Regulations concerning accounts.

Article 10 --

The existence of a control society becomes effective when the approval mentioned in Paragraph 2, Article 8 is obtained, or when the Articles of the Society are drawn up in accordance with the provisions of Paragraph 3, Article 18 of the National General Mobilization Law.

The competent Minister shall announce the purpose of establishing the control society and its articles when the approval mentioned in the preceding paragraph is obtained.

Article 11 --

When a control society is established all those who have the qualifications for membership are made members of the control society.

Article 12 --

The following officials shall be appointed in a control society.

- (a) President - one
- (b) Directors - several
- (c) Inspectors - several
- (d) Members of the board of trustees - several

Two vice-presidents or less in addition to the officials mentioned in the preceding paragraph and one chief-director may be appointed in a control society depending on the Articles of the society.

Article 13 --

The president represents the control society. He controls and guides the industry concerned and manages all the affairs of the society.

The vice-presidents assist the president. The (first) vice-president, according to the sequence of the vice-presidents previously decided by the president, substitutes for the president when he cannot fulfill his duties. When the president's seat is vacant, the (first) vice-president performs the official duties of the president.

The Chief Director assists the president and the vice-presidents in managing the affairs of the society. The chief director substitutes for the president and the vice-presidents if they are not able to fulfill their duties. He performs the official duties of the president if the seats of the president and the vice-presidents are vacant.

The directors assist the president, the vice-presidents and the Chief Director, and they manage the affairs of the society accordingly. The (first) director, in accordance with the sequence of the directors previously arranged by the president, substitutes for the president in case the president, the vice-presidents and the Chief Director are not able to fulfill their duties. He performs the official duties of the president if the seats of president, of the vice-president and the Chief Director are vacant.

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The inspectors investigate the financial conditions of the control society.

The members of the Board of Trustees give their opinions to enquiries made by the president.

Article 14 --

The competent minister appoints the president of a society from among those suggested by the nominating committee.

The competent Minister appoints members of the nominating committee from among those who have had experience with or have made special studies on the industry concerned.

The president appoints the vice-presidents, the chief-director, the directors and the members of the Board of Trustees from those who have had experience with or have made special studies on the industry concerned.

Members of the board of trustees elect the inspectors in accordance with the provisions of the Cabinet decree. The appointments of the vice-presidents, the chief-director and the directors have no effects unless the approval of the competent Minister is obtained. When the competent Minister has given the approval as provided in the preceding paragraph and has made the appointments as provided in Paragraph 1, he shall announce the facts.

Article 15 --

The terms of the officials of the control society are as follows:

President	Three years
Vice-President	"
Chief-Director	"
Directors	"
Inspectors	Two years
Members of the Board of Trustees	"

The president may discharge the vice-presidents, the chief-director and the directors, even during their terms of office if he considers this act to be necessary.

The dismissal mentioned in the preceding paragraph has no effect unless the approval of the competent Minister is obtained.

The competent Minister shall announce the fact when he has given his approval.

Article 16 --

The president, the vice-presidents, the chief-director and the directors shall not be engaged in other official duties or in commercial business. An exception may be made when the permission of the competent Minister is obtained.

Article 17 --

The Control Society may give suggestions about matters related to the industry to the ministers concerned with the industry.

The Control Society must give answers to the enquiries made by the ministers concerned with the industry.

Article 18 --

The Control Society may request from the members and organizers of the member organizations the submission of the necessary material for the investigation of certain facts regarding the industry concerned.

Those who are requested to submit certain material, in accordance with the provisions of the preceding paragraph, must do so immediately.

Article 19 --

The Control Society may levy upon the members assessments as provided in the Articles of the Society.

Article 20 --

When any other assessment is necessary for the operation of the enterprise, depending on the provisions of the Cabinet decree, the Control Society may levy the assessment, other than those already levied in accordance with the provisions of the preceding article. The Control Society may levy the assessment upon the entire body or a group of the members after the approval of the competent Minister is obtained.

Article 21 --

The Control Society may levy fines, as provided in the Articles of the Society, upon those members who have violated the Articles or the control regulations.

Article 22 --

If there are people who fail to pay the assessments mentioned in the articles 19 and 20, the Municipality (Shi), Town (Cho), and Village (Son) may deal with the situation according to the regulations

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concerning the non-payment of tax in that locality, provided that the Control Society has made a request to the authorities of the locality. In such case the Control Society shall pay 4 per cent of the collected amount to the city, town or village.

When there is no organized town or village, the corresponding body in the locality shall take the place of the town and village mentioned in the preceding paragraph.

The order of priority of claims for the assessments mentioned in the provision of paragraph 1 is next to that of the municipality, town, or village tax or to the corresponding tax system. The time limitation for payment of this levy depends on the tax regulations governing the municipality, town and city.

Article 23 --

The Control Society shall establish the control regulations governing members and organizers of organizations having relations with enterprises belonging to the industry concerned.

Article 24 --

Revisions of the Articles and establishment and revisions of the control regulations shall not take effect until approved by the competent Minister.

The competent Minister must announce the fact that he has given the approval mentioned in the preceding paragraph.

Article 25 --

The members and organizers of the member organizations of the Control Society must act in accordance with the control regulations.

Article 26 --

The Control society may have the officials and other employees of the Society investigate the business affairs, financial conditions, account books, establishments, and other property of the members or of the organizers of the member organizations of the society if the society considers it necessary.

The members and organizers of the member organizations of the Control Society cannot reject, interfere, or evade the investigations mentioned in the preceding paragraph.

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When the Control Society has the officials and other employees of the society make the investigation according to the regulations of Paragraph 1, the control society must provide the investigators with identification cards which shall certify their official positions.

Article 27--

When the conduct of directors or managers and other officers who are in position to operate the business of the member corporations and of corporations which organize the member associations, comes under one of the following sections, and when they are considered to be interfering with the control and management of the industry concerned, the president of the control society of the industry concerned may, with the approval of the competent Minister, order the corporation to discharge the officials. The chief director of a control association, which is a member of a control society, is not subject to this regulation:

- a. When the ordinance, or the decisions based on the ordinance by an administrative government office, is violated.
- b. When the public welfare is jeopardized.
- c. When the control regulations are violated.

Article 28 --

The president shall call the regular general meeting of a Control Society once every year.

The president may call special general meetings at any time if needed.

Article 29--

The president shall decide the following matters after consultation at the general meeting:

- a. Amendment of the articles of the society.
- b. Budget
- c. The method of levying the assessment provided in Articles 19 and 20.

Article 30--

The president shall prepare a business report and he shall have the inspectors prepare a financial report of the control society.

Article 31--

The government's administrative office may summon the Control Society, the members or the organizers of the member associations

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to make their business reports whenever the office considers necessary; this office may have the officials of the government administrative office inspect the factories and other property concerned. They may have the officials investigate the business condition, accounting books, documents and other items according to the regulations of Articles 31 of the National General Mobilization Law.

When the officials concerned are asked to make investigations and inspections, they must possess the identification cards certifying their official position.

Article 32 --

The Ministers connected with a Control Society may demand that the society investigate the business affairs of the industry concerned.

Article 33 --

The competent Minister may require the Control Society to operate a needed enterprise or to alter the articles of the society, and perform other functions when he considers such acts necessary to control the operation of the industry concerned.

Article 34 --

The competent Minister may issue necessary orders to a Control Society concerning the business and accounts of the society, and in case of necessity, he may take over the management thereof.

The competent Minister may have the inspectors make a report on the results of their investigation.

Article 35 --

The competent Minister may discharge the president when the conduct of the latter violates the ordinances and the decisions based on the ordinances, or damages the public interest and when he considers the president unfit to control the industry concerned.

The competent Minister may discharge the vice-presidents, chief director, directors, inspectors and the members of the Board of Trustees when the conduct of these men violates the ordinances or the decisions based on the ordinances, or when they damage the public interest.

The competent Minister shall announce the fact when he has discharged the president, vice-president, chief-directors or directors according to the regulations of the preceding paragraph.

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Article 36 --

The Control society may be dissolved by the orders of the competent Minister.

The competent Minister must make the announcement of the fact when he has given the order mentioned in the preceding paragraph.

Chapter III

Control Association (Tosei - kumiai)

Article 37 --

The Control Association strives to control the management of the industry concerned so as to develop most effectively the entire economic power of the nation and to cooperate in carrying out the national plan for the industry concerned.

Article 38 --

The Control association shall be organized by the kind of industry in a given district.

The district mentioned in the preceding paragraph, except in special cases, shall be determined in accordance with the division of local administration, do, fu, ken, or two or more divisions of the same.

Article 39 --

The control association shall undertake the following functions in order to accomplish its aim:

a. Control and guide production and distribution of the industry concerned in a given district; control and guide enterprises undertaken by the members of the Association which belongs to the industry concerned.

b. Provide for the equipping of the industry concerned in a given district.

c. Develop techniques, increase efficiency, reform the management and carry on other activities in the plants established by the members for the development of the enterprises belonging to the industry concerned.

d. Investigate and conduct research concerning the industry in a district.

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e. Inspect the enterprises carried on by the members of the Association.

f. Carry on the enterprises necessary to accomplish the purpose of the Control Association in addition to the functions mentioned in each preceding section.

Article 40 --

Those who are qualified for membership in the Control Association are as follows and may be appointed by the competent Minister:

a. Those who are engaged in the industry concerned in a given district.

b. Those organizations composed of people who are engaged in the industry concerned in a given district.

c. The organizations composed of the organizations mentioned in the sections (a) and (b); the organizations composed of the organizations mentioned in the preceding section.

Article 41 --

When the competent Minister intends to have a Control Association established, he shall order people who are qualified for membership in the Control Association in accordance with the provisions of the preceding article, to establish the association in a given locality in accordance with the provisions of the Cabinet decree.

Article 42 --

The following matters shall be stated in the Articles of the Control Association:

- a. Purpose.
- b. Title.
- c. District.
- d. Location of the office.
- e. Regulations concerning the members of the Associations.
- f. Regulations concerning the enterprise and its operation.
- g. Regulations concerning officials.
- h. Regulations concerning meetings.
- i. Regulations concerning the treasury.

Article 43 --

The following officials shall be established in a Control Association:

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Copy No. 225

FOREIGN ECONOMIC ADMINISTRATION
Enemy Branch

POSTWAR CONTROL OF THE JAPANESE LIGHT METALS INDUSTRY

September 20, 1945

SECRET

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5. Light metals plants now in existence in former Japanese-controlled areas of the Asiatic mainland are more than adequate to produce the minor amounts of finished light metals products which Japan exported to other Far Eastern areas in the prewar years.

6. Elimination of Japanese light metals production is essential to prevent substitution of aluminum, magnesium and their alloys for certain uses of iron and steel, copper and other metals whose control may be undertaken.

7. Employment in any aspect of the Japanese light metals industry was very minor in the Japanese peacetime economy. The displacement of workers from the present over-expanded industry should therefore not be a substantial factor in determining the future of light metals production or processing in Japan.

The following fundamental steps appear to be necessary for the complete elimination of aluminum and magnesium production and for the strict limitation of their processing in Japan:

1. Removal or destruction of all Japanese plants producing alumina, aluminum or magnesium metal.
2. Removal or destruction of all Japanese light metals processing equipment not required to meet approved civilian requirements of fabricated products.
3. Controls over imports of alumina and of primary and secondary aluminum, magnesium and their alloys, and over selected raw materials for their production.

Postwar Control of the Japanese Light
Metals Industry

PART I - SUMMARY

Thorough study of the Japanese light metals industry indicates that complete elimination of aluminum and magnesium production and strict limitation of their processing are necessary steps toward the industrial disarmament of Japan to safeguard future peace. The following basic reasons support this conclusion:

1. The Japanese light metals industry was created during the 1930's solely to make Japan self-sufficient in these metals, which are essential in the manufacture of aircraft, incendiary bombs, and other materials of war.
2. Production and processing of aluminum and magnesium have been expanded far beyond any legitimate Japanese civilian needs for these metals and, unless controlled, will be of continuing military value to Japan.
3. It will not be possible to control the Japanese light metals industry by limiting imports of raw materials, because both aluminum and magnesium can be produced from materials available in Japan.
4. Japanese requirements for aluminum and magnesium were formerly met by net imports so modest in amount that a similar arrangement in the postwar period should be economically feasible and justifiable.

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which Japan was actively fostering the rapid expansion of all industries vital to a war program.

During the years immediately preceding 1934, world aluminum production suffered a marked slump. Overall world output in 1933 was only 53.5 percent of the 1930 level; in the United States the figure was 37.2 percent. Obviously no economic justification existed for establishment of the Japanese aluminum industry at that time.

The importance nevertheless attached by the Japanese government to production of the light metals is readily shown by the manner in which the aluminum industry was fostered and subsidized. The government encouraged the establishment of aluminum manufacturing companies sponsored by old-line concerns with technological background, with control over power installations or with experience in importing machinery and supplies.

The pioneer producers had the benefit of foreign technical assistance and imported equipment in building and equipping the new plants. Although these factors facilitated development of the industry, they probably made installation costs high. Production costs for aluminum were also elevated by the necessity of importing not only the basic raw material, bauxite, but also various accessory raw materials.

In June 1936 the infant industry was granted the protection of a new tariff law which increased the duty on aluminum ingot from 72 to 295 yen per metric ton. The duty on scrap was raised to the same figure.

Another substantial impetus to expansion of the industry was given by the "Light Metal Manufacturing Industry Law" promulgated on May 1, 1939.

Under this law,^{1/} companies licensed to enter the light metals field were

^{1/} Aluminum Nenkan-Magnesium Soran (1939).

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PART II - DISCUSSION

In studying the question of economic controls as a means of curbing future Japanese aggression, it is obviously necessary to examine all branches of industry which are major contributors to war potential. Fundamentally, interest centers in preventing manufacture of the actual instruments of war, but back of such production lies the supply of basic materials such as metals. Because the light metals, aluminum and magnesium, have achieved outstanding importance in modern warfare, particularly for aircraft and incendiaries, this industry must be considered basically as a part of the Japanese war machine.

It is, therefore, essential to study all aspects of the Japanese light metals industry in order to determine whether controls are necessary, whether they are feasible and how they may best be applied.

A. Justification of the Control Proposals1. How and Why the Japanese Light Metals Industry Developed

Because the role of the light metals in modern warfare is thoroughly established, it is not necessary to dwell in detail on their importance to the Japanese in the current war. The Japanese aircraft industry is heavily dependent on light metal alloys, as is ours. The Japanese use aluminum and magnesium in incendiary and other bombs, as we do. In other Japanese war material also, wide use is made of the light metals.

These uses were obviously anticipated long before 1941. Magnesium production was undertaken in Japan in 1931 and aluminum production began in 1934. The two industries were therefore created during the period in

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been accelerated since 1941, and because of other changes during the war years, the present status of the industry is somewhat uncertain, though the following summary is believed to be **substantially** correct:

	<u>Alumina</u>	<u>Aluminum</u>	<u>Magnesium</u>
No. of plants, Japan Proper	. 13	13	7
" " " , other Jap. areas	10	9	7
" " " , all " "	<u>23</u>	<u>22</u>	<u>14</u>
Cap., m.t./yr., Japan Proper	429,000	147,500	9,400
" " " , other Jap. areas	230,000	137,500	10,950
" , " " , all " "	<u>659,000</u>	<u>285,000</u>	<u>20,350</u>

Ownership, location and annual capacities of individual plants are listed in **Appendices 1, 2 and 3** of Part III.

Between production of the light metals and their emergence as finished goods for military or civilian use stands the fabricating step in which the metals or their alloys are rolled, extruded, forged or cast into usable semi-fabricated shapes. The Japanese light metals fabrication industry antedates the production of aluminum and magnesium, for the Japanese had been fabricating imported aluminum on a modest scale for a number of years. In this field the Japanese were able to draw on the experience of several large concerns well-versed in handling other metals. Foreign technicians and imported equipment were also brought in before the war.

There is little reason to doubt that the fabricating industry was adequate to process the Japanese wartime output of aluminum and magnesium. Much of the equipment is known to be modern though some degree of improvisation has probably entered into the wartime expansion of the industry.

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exempt from profit tax, income tax and local taxes for five years after their completion, and were exempt from import duties on approved machinery and equipment. Licensed companies were also permitted unusually liberal terms with regard to capital increases and issuing of debentures.

The government reserved the right to inspect plants, set prices, regulate imports, exports and sales of the light metals and the required raw materials, and, based on military necessity, to order increases in capacity, changes in manufacturing processes, stockpiling of raw materials, and research on manufacturing problems, and to regulate corporate form.

Because of the liberal provisions of this law and the previous liberal policy, a number of companies were encouraged to enter the field. However, it seems likely that in any event other factors would have directed the erection of a number of relatively small plants rather than a few large ones. Of most weight was undoubtedly the not too abundant supply of electric power, which made it advisable to scatter the light metals plants wherever power surpluses were available or where new power installations (particularly hydroelectric) were feasible. In addition, security considerations probably also dictated a scattered light metals industry.

The Japanese government fostered installation of light metals plants not only in Japan Proper but also in Formosa, Korea, Manchuria and North China in order to take advantage of resources in raw materials and electric power. Consequently the light metals capacity at present available in Japan itself is considerably increased by the capacities installed in other Japanese-controlled areas. Because this development has

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From 1926 to 1929, inclusive, aluminum imports averaged 3,659 metric tons annually; in the depression years of 1930 to 1933 they dropped to an average of 7,830 metric tons. Aluminum production began in 1934 and apparent consumption averaged 16,825 metric tons from 1934 thru 1937, of which an average of 71 percent came from imports. Imports totalled about 23,000 metric tons in 1938 and again in 1939, accounting for 63 percent and 51 percent of apparent consumption. Imports dropped to 2,420 metric tons in 1940, presumably due to foreign embargoes and to the war in Europe rather than to lack of interest on the part of the Japanese.

As installed capacity increased, domestic output advanced steadily from the 664 metric tons produced in 1934 to a reported maximum of 140,000 metric tons in 1943, presumably for all Japanese-controlled areas.^{1/} It is believed that about 50 percent of the 1943 production came from plants in Japan Proper. After 1943, aluminum production dropped, largely due to decreased imports of bauxite, and the Japanese were able to produce only 6,500 metric tons of aluminum in the first quarter of 1945.^{1/}

The aluminum consumed in Japan in 1934 was distributed among the following uses:^{2/}

<u>Industry</u>	<u>Quantity in metric tons</u>	<u>Percent of Total</u>
Transportation (land, water, air)	4,230	38
Household utensils and food equipment	1,802	16
Electric cables and wire	1,915	17
Machinery	901	8
Steel metallurgy	901	8
Non-ferrous alloys	450	4
Building	338	3
Chemical equipment	225	2
Other	450	4
Total	<u>11,262</u>	<u>100</u>

^{1/} Report of Prince Higashi-Kuni to Japanese Diet, quoted in Domei radio broadcast, Sept. 5, 1945.

^{2/} Percentages - The Mining Magazine (London) Vol. 59, No. 2, p. 81, Aug. 1938.
Quantity - See Appendix 5 of Part III.

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Available lists of Japanese metal fabricating plants cover operations not here considered as having to do with the processing of the light metals and their alloys into primary shapes. The list of fabricating plants in Appendix 4 is restricted to those believed to be the major installations specializing in the rolling of aluminum alloy sheet. Some of these mills also made forgings and extrusions but most light metal castings, forgings and extrusions are believed to have been made in airframe plants, and some castings were made in small foundries. Such plants are not included in this study and are therefore not listed in Appendix 4. Likewise, this appendix does not include those plants producing finished products from the primary shapes, nor is it necessary to consider this category for purposes of control. Such plants will be automatically restricted if the metal producing plants and the primary fabricating plants are controlled.

2. Japanese Production, Consumption and Requirements of Light Metals

Before production of the light metals began in Japan, consumption was relatively small and was of course met entirely by imports.^{1/} Production of magnesium metal began on a small scale in 1931; apparent consumption (including very small imports) increased from 10 tons in 1931 to 138 tons in 1934, averaging 76 tons. After this period, magnesium production was rapidly expanded; capacity in Japan Proper is estimated to have reached 9,400 metric tons, and in all Japanese-controlled areas, 20,350 metric tons.

^{1/} See Appendices 5 and 6 of Part III for data on Japanese production, exports and imports of aluminum and magnesium.

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industry first began, was to use clays, shales and alunite from Manchuria, Korea and North China. These attempts were not markedly successful and most of the pioneer companies turned to imported bauxite before 1941.

As shown in Appendix 7 of Part III, the Japanese imported much more bauxite after 1937 than required for their current production of aluminum. It is obvious from the enormous size of the bauxite stockpile created that the Japanese had not at that time solved the problem of producing aluminum from domestic raw materials and were actively creating a large bauxite reserve for future use.

The 642,597 tons of bauxite presumably held in Japan at the end of 1940 (see Appendix 7) were sufficient to make about 160,000 tons of aluminum metal. No data are available on imports of bauxite during 1941, but it was reported that shipments from the Netherlands East Indies stopped entirely in August of that year. This loss was a severe blow to the Japanese for the NEI had furnished more than 60 percent of Japanese imports of bauxite from 1935 through 1940 and supplied nearly 75 percent of the large imports in 1940.

Obviously, Japanese prospects for bauxite imports improved very considerably with Japanese occupation of the Netherlands East Indies and Malaya and large shipments were undoubtedly made from these areas until Allied interference virtually cut them off.

Because Japanese aluminum requirements increased enormously after 1940, it was necessary for the Japanese to draw heavily on their large stockpile of bauxite. It is believed that the stockpile has by now been exhausted, and that no supplies of bauxite exist in Japan.

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Because of advances in civilian uses of light metals, Japanese consumption in the postwar period probably can not reasonably be pushed back to the level of the years before 1934. Per capita consumption of aluminum in Japan from 1926 through 1933 averaged only about $\frac{1}{4}$ lb. annually; in the same period apparent consumption in the United States was about 2 to 3 lbs. per person per year. A 40 percent increase over 1926-1929 consumption of aluminum in Japan would raise the allowance to about 12,000 metric tons per year, and would be approximately at the 1934 level.

3. Sources and Requirements of Raw Materials for the Japanese Light Metals Industry

Aluminous ores. Bauxite, the ore universally most favored for aluminum production, apparently does not occur in Japan Proper. Of the other Far Eastern areas under Japanese control before 1941, only the Palao, Ponape and Yap Islands appear to have commercially exploitable bauxite deposits, reported to aggregate 10,000,000 metric tons of high grade material. Bauxite mining in these islands began in 1938; maximum prewar production was reached in 1940 when 43,000 metric tons were mined and shipped to Japan. Since four tons of high-grade bauxite on an average are required to yield one ton of aluminum, the 1940 output was sufficient to produce only 10,750 metric tons of metal, less than one-third of the estimated Japanese aluminum production for that year.

It was, therefore, necessary for the Japanese, before the war, to import large quantities of bauxite from non-Japanese controlled areas or to make use of such aluminous raw materials as were available in localities held by the Japanese. The original endeavor, when the Japanese aluminum

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alumina from Tennessee clays by the lime sinter-soda leach process, believed to be the method most widely used by the Japanese. It must therefore be assumed that future work by the Japanese could solve the difficulties encountered in their attempts to use clays, shales and alunite as a source of alumina, and the Japanese alumina potential must be evaluated accordingly.

Indications are that the Japanese attempted to use aluminous raw materials from Manchuria, Korea and North China to replace the unavailable bauxite. They also reported finding such materials in Iwate prefecture, Honshu and on Hokkaido. Analyses reported in Appendix 8 of Part III show a striking similarity in chemical composition of the clays successfully used in the TVA studies and of Japanese deposits of ceramic clays. It is, therefore, possible that Japanese aluminum production in the postwar period cannot be effectively controlled by limiting imports of bauxite.

Accessory raw materials used in the aluminum industry. As shown in Appendix 9 of Part III, the alumina production methods most commonly used by the Japanese require either soda ash or caustic soda, which can be made from soda ash. Consumption is small, however — 0.061 ton of caustic soda (equivalent to 0.088 metric tons of soda ash) per ton of

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This belief is reinforced by the greatly renewed Japanese interest in production of alumina from the shales, clays and alunite available in Korea, Manchuria and North China. These materials are not suitable for use in standard Bayer plants designed to produce alumina from bauxite. The Japanese therefore made major adjustments in the equipment of existing alumina plants and in some cement plants, in the hope of producing the required alumina from such shales, clays and alunite.^{1/} In the course of this program, a considerable increase in alumina capacity was apparently effected, beyond the needs of the aluminum plants under Japanese control, but when bauxite became unavailable the unconverted Bayer plants could no longer be operated. However, the total installed capacity must be considered in evaluating overall Japanese potential for alumina production, and is therefore included in Appendix 1 and in the summary table on page 6.

Recent evidence strongly indicates that the Japanese attempts to produce their wartime alumina requirements from clays, shales and alunite were on the whole not successful. The conversion program referred to above is believed to have been completed in June 1944, yet, according to a Japanese source,^{2/} aluminum production fell from 140,000 metric tons in 1943, the peak year, to only 6,500 metric tons in the first quarter of 1945. This drastic decrease cannot be accounted for by bomb damage, electric power shortage or any other major factor except the inability of the Japanese to produce the necessary alumina.

However, workers in the Tennessee Valley Authority have reported favorable technological results from pilot plant studies on production of

^{1/} See Appendix 8 for analyses of various aluminous raw materials, and Appendix 9 for description of various processes used for production of alumina.

^{2/} See p. 8 and Appendix 5.

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Basic raw materials for magnesium production. Because magnesium can be produced from sea water, its provision in adequate quantities offers no difficulty in Japan. Natural brines or the bitterns left from production of solar salt are alternate sources. Dolomite is widely distributed and is the raw material of choice in the Pidgeon process. It is thus evident that Japan will not lack a ready source of magnesium.^{1/}

Accessory raw materials for magnesium production. According to the process used, a variety of accessory raw materials may be required for magnesium production (see Appendix 9). Because overall magnesium requirements in either a peacetime or war economy are relatively small, the problem of supplying the needed accessory materials plays no controlling role in production of the metal.

As in electrolytic production of aluminum, power requirements are large for electrolytic production of magnesium. However, unlike the aluminum industry, alternative methods are available for magnesium production. Control over electric power distribution or generation is thus not an effective means of curbing magnesium production.

4. Potential Role of Scrap Metal in Supplying Future Japanese Requirements for the Light Metals

Besides the aluminum and magnesium produced as virgin metal directly from the raw materials, scrap or secondary metal may also play an important part in satisfying a country's requirements for the light metals. Secondary metal is of two kinds: (1) the scrap generated by users of the virgin metal or its alloys in fabricating finished goods, and (2) the

^{1/} Nearby Korea has virtually inexhaustible supplies of high grade magnesite, and excellent raw material for magnesium production.

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alumina by the Bayer process, and 0.042 ton of soda ash per ton of alumina by the lime sinter-soda leach process. The total soda requirement, calculated as soda ash, for the estimated 1944 Japanese production of alumina probably does not exceed 35,000 metric tons.

In 1938 total Japanese production of soda ash was 886,721 metric tons. Even though much of the salt required for soda ash production is imported into Japan, soda ash requirements would not be a limiting factor in determining Japanese alumina production.

The quantity of limestone required in the lime sinter-soda leach process is large and the quality requirements are rigorous but neither factor would limit or control alumina production. The same is true of accessory materials required in the other alumina processes.

Aluminum metal is universally made by electrolysis of alumina dissolved in molten cryolite. High grade carbon is required for the anodes, about 0.6 to 0.7 ton being consumed per ton of metal produced. Consumption of cryolite and other fluoride salts is about 0.1 ton per ton of aluminum. Before the war, Japan imported pitch coke for electrodes and also imported cryolite. Domestic sources of electrode materials had to be used during the war and cryolite was made from fluorspar mined in the Far East. Fluorspar has a variety of uses and its control would be difficult to enforce.

Large amounts of electric power are required in the electrolytic production of aluminum, consumption being about 22,000 kwh. per metric ton of metal. A plant producing 20,000 metric tons of aluminum annually would thus require 440,000,000 kwh. of electric power. It would thus be difficult to conceal operation of a sizeable aluminum plant if electric power were closely allocated or its generation controlled.

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scrap obtained by salvaging discarded metal objects. Scrap of the first type may be re-used directly by the producing industry, usually being first cast into ingot; scrap of the second type reappears on the market as secondary ingot.

Well-segregated scrap generated by the fabricating industries may be put to all the uses for which the original ingot was suited, including the making of high-strength alloy products. However, insofar as the Japanese are forced to meet their postwar needs for aluminum from salvage scrap, they will not be able to make airplane wings and certain other critical war items requiring high-strength alloys.

As shown in Appendix 5 of Part III, Japanese imports of aluminum in the prewar years included a substantial proportion of scrap metal, ranging from less than 1 percent of the total in 1927 to a maximum of 55 percent in 1933. The provisions in the tariff act of 1936, by which the duty on both primary and secondary aluminum was set at 295 yen per metric ton, was possibly intended to discourage imports of scrap metal. Scrap imports were relatively low in 1936 but in 1938 and 1939, they increased in almost the same proportions as did imports of virgin metal.

It is not possible to estimate what amount of light metal scrap will be found available in Japan. The total will include not only stocks of recirculating scrap at plants and such salvage scrap as may be strewn over Japan, but also metal in the "pipeline" from semi-fabrication to the finished stage. To this must be added whatever amount of metal still exists in primary ingot form.

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It is essential that there be made a complete inventory of all primary and secondary aluminum and magnesium alloys available in Japan before a decision is made as to the amount of new metal which the Japanese may be allowed to import. Such stocks should be kept under Allied control and released at the rate necessary to meet Japanese civilian needs. It is possible that requirements for some time to come can be met from stocks found in Japan.

5. Labor Requirements in the Light Metals Industry

Specific data on employment in the basic plants of the Japanese light metals industry are not available, but comparable data for the United States indicate the rather modest labor requirements (see Appendix 10). Even assuming considerably lower output per worker in Japanese plants, it is not likely that more than 15,000 workers were employed in Japan during the war in production of alumina and of aluminum and magnesium ingot.

It seems probable that the entire Japanese light metals industry, including production of primary and secondary metals and their fabrication, even at the wartime rate of production and processing, employed no more than 100,000 workers. The displacement of workers is, therefore, not a major consideration in determining the future of the Japanese light metals industry.

6. Future Sources of Light Metal Products for Other Far Eastern Areas

As shown in Appendices 5 and 6, Japan's exports of primary aluminum and magnesium and scrap aluminum were insignificant before the war. Total aluminum exports in this category exceeded 1,000 metric tons only in 1935. Maximum magnesium exports were 237 metric tons in 1936.

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Of more significance were exports of fabricated aluminum products, chiefly aluminum utensils to China and the Pacific Islands and sheet aluminum to British India. (See Appendix 11). Maximum exports (1935) were valued at 3,314,600 yen.

After that time the Japanese built aluminum plants in Formosa, Manchuria, Korea and probably North China with a total capacity estimated at 137,500 metric tons. (See page 6). Although the weight of metal in the aluminum product exports is not known, it could not have been more than 1,000 tons as a maximum and could obviously be supplied by Far Eastern plants outside of Japan Proper.

7. Aluminum and Magnesium as Substitutes for Other Metals

In many of the uses to which the light metals have been put, they have been chosen because no other commercial metals are as well suited in physical or chemical properties. This is notably true of their chief wartime uses -- aircraft and incendiaries. Aluminum alloys also have won a place for themselves in the civilian economy which assures a continuing demand for the metal. Magnesium alloys in the prewar years had less commercial acceptance for civilian uses.

The degree to which the light metals will be used in the postwar years in a given country is complicated by a number of factors. Assuming the free availability of iron and steel, copper and other important metals, the amounts of light metals used will depend on their availability, on requirements for the customary uses and on relative costs, consumer acceptance and on technological research with regard to new uses. Recent estimates of possible consumption in the United States after the war differed

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widely, according to the importance attached to these various factors.^{1/} However, it is commonly agreed that the light metal alloys can be substituted for many customary uses of iron and steel in transport equipment, electrical appliances, industrial equipment, and in building construction. Aluminum can also be substituted for copper, as in electric cable.

Assuming that iron and steel, copper and other strategic metals are to be controlled in Japan in the postwar period, it is obvious that the Japanese will neglect no opportunity to substitute other materials for the controlled metals. Ready availability of the light metals would, therefore, to some degree, vitiate attempted control over the heavier metals. Control over the light metals is thus an integral part of the general control over Japanese industrial capacity.

B. Proposed Controls Over the Japanese Light Metals Industry

The necessity of sharply reducing the amounts of light metals available to the Japanese has been clearly set forth in the preceding section. Controls intended to achieve this end must be simple to institute and supervise and difficult to evade. With these factors in mind, the following controls are proposed:

1. Removal or destruction of all Japanese plants producing alumina, aluminum or magnesium.

This is believed a necessary step in the industrial disarmament of Japan, and should not be difficult to accomplish during the occupation period. To delay or discourage reconstruction of such plants, facilities

^{1/} Senate Committee on Small Business - Hearings on Light Metals, February-March, 1945.

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for generating direct current or for **converting** alternating into direct current should be considered as part of the metal producing plant which they serve.

Presumably, periodic inspection will be required to assure that new capacity is not erected for producing aluminum and magnesium. Such new construction can be rendered difficult if the Japanese are denied access to imported equipment and are not permitted the opportunity of making it themselves. If the generation and distribution of electric power are controlled, electrolytic production of aluminum and magnesium should not be difficult to detect.

However, it must be pointed out that one of the commercial methods for magnesium production, the Pidgeon process, is eminently suited to operation in small units and does not directly require large amounts of electricity. Such plants might be easily concealed.

For several reasons, complete elimination of light metals plants in Japan is believed preferable to permitting a limited capacity to remain. If the Japanese were allowed to produce their legitimate requirements of aluminum and magnesium, they would continue to have a body of trained technicians who could serve as a nucleus for rebuilding the industry. Research on new or better production methods would be encouraged by the existence of such an industry.

It may be argued that elimination of light metals production in Japan may not serve to control future aggression. However, the light metals are essential components of war material as we now know it, and it cannot be assumed that they will not be of vital usefulness in the future.

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2. Removal or destruction of all Japanese light metals processing equipment not required to meet approved requirements of fabricated products.

It is obvious that reduction of Japanese capacity for processing the light metals and their alloys will serve as an additional check on the resurgence of the Japanese light metals industry.

In practice, a comfortable surplus of processing capacity must be allowed because of different choices which the Japanese may be allowed to make as to utilization of their light metals supplies. However, it will be advisable to eliminate certain types of equipment required for producing or processing high-strength alloys, for producing large size die-castings or large dimension sheet and other facilities essentially only of military value.

The equipment allowed to remain should be of types not directly usable in the aircraft industry and for other armament purposes. Equipment which has been used essentially to serve such industries should be marked for elimination.

The resources left in Japan for rebuilding heavy equipment of the type required in fabricating light metal alloys and the access to imported equipment will determine the ease with which the industry can be rebuilt.

3. Controls over imports of alumina and of primary and secondary aluminum, magnesium and their alloys, and over selected raw materials for their production.

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Control over Japanese imports of the light metals and of the raw materials required for their production is a necessary adjunct to the elimination of light metals manufacture in Japan.

It seems possible that sufficient supplies of light metals will be available in Japan at the end of the war to meet legitimate requirements for sometime in lieu of imports. Such stocks, in whatever form found or wherever located, should be kept under control and released at the same rate at which imports would be allowed.

Scrap metal should be taken into consideration in determining the amount of metal to be made available. Some virgin metal will, however, be required to "sweeten" the secondary metal for certain uses.

As an additional check on light metals production, importation of bauxite should not be permitted. Because of the varied uses of dolomite and magnesite, aside from production of magnesium metal, it does not seem practicable to control their import.

Import controls should extend to semi-fabricated products and importation should be forbidden of any type whose production in Japan is not allowed. It should not, however, be necessary to control importation of finished light metal products for civilian use.

PART III - APPENDICES

1. Japanese Alumina Plants
2. Japanese Aluminum Plants
3. Japanese Magnesium Plants
4. Japanese Light Metals Fabricating Plants
5. Japanese Production, Exports and Imports of Aluminum
6. Japanese Production, Exports and Imports of Magnesium
7. Japanese Imports, Requirements and Stockpiles of Bauxite
8. Chemical Composition of Some Naturally Occurring Aluminous Raw Materials
9. Production Processes Used in the Japanese Light Metals Industries
10. Employment and Production Rates in the Light Metals Industry of the United States, 1944
11. Japanese Exports of Aluminum Manufactures

APPENDIX 2

Aluminum Plants in Japan Proper

Company	Location	Alumina Production at Same Plant	Esti Capa m.t.
<u>HONSHU</u>			
Kokusan Keikinzoku K.K.	Toyama-ken, Kamini Kawa-gun, Sasazu-mura	No	6,
Nasu Aruminiumu K.K.	Tokyo, Honjo-ku, Kamezawa-cho, 1-chome 39	No	1,
Nichiman Aruminiumu (Showa Denko)	Toyama-ken, Higashi Iwase-machi	Yes	8,
" " " "	Fukushima-ken, Koriyama-shi	No	10,
Nippon Keikinzoku	Shizuoka-ken, Kambara-shi	No	40,
" "	Niigata-ken, Nakakambara-gun, Toyano-mura	No	30,
Nippon Soda K.K.	Toyama-ken, Takaoka-shi, Mukono-machi	Yes	8,
Nitto Kagaku Kogyo K.K.	Aomori-ken, Hachinohe-shi, Konakano-cho	Yes	4,
Osaka Yogyo Cement K.K.	Osaka	No	2,
Showa Denko Kakagu Kogyo K.K.	Nagano-ken, Shinano Omachi-shi	Yes	12,
" " " "	Fukushima-ken, Yama-gun, Kitakata-machi	No	
Toyo Aruminiumu (Ibigawa Denko)	Gifu-ken, Ogaki-shi	No	6,
<u>SHIKOKU</u>			
Sumitomo Aruminiumu K.K.	Ehime-ken, Niihama-shi	Yes	20,
		Total	147,

Aluminum Plants in Japan Proper

Location	Alumina Production at Same Plant	Estimated Capacity m.t./yr.
<u>HONSHU</u>		
K.K. Toyama-ken, Kamini Kawa-gun, Sasazu-mura	No	6,000
Tokyo, Honjo-ku, Kamezawa-cho, 1-chome 39	No	1,500
(Showa Denko) Toyama-ken, Higashi Iwase-machi	Yes	8,000
" " Fukushima-ken, Koriyama-shi	No	10,000
Shizuoka-ken, Kambara-shi	No	40,000
Niigata-ken, Nakakambara-gun, Toyano-mura	No	30,000
Toyama-ken, Takaoka-shi, Mukono-machi	Yes	8,000
Aomori-ken, Hachinohe-shi, Konakano-cho	Yes	4,000
K.K. Osaka	No	2,000
K.K. Nagano-ken, Shinano Omachi-shi	Yes	12,000
Kogyo K.K. Fukushima-ken, Yama-gun, Kitakata-machi	No	?
" " Gifu-ken, Ogaki-shi	No	6,000
<u>SHIKOKU</u>		
K.K. Ehime-ken, Niihama-shi	Yes	20,000
Total		147,500

APPENDIX 1

Alumina Plants in Japan Proper

Company	Plant Location	Type of Plant	Aluminum Production at Same Plant	Estimated Capacity in m.t.
<u>HONSHU</u>				
Asada (Shikawa) Kagaku K.K.	Hyogo-ken, Shikawa-shi	A	No	
Asano Cement K.K.	Hiroshima-ken, Mihara-shi, Itozaki-machi #5310	B	No	61
Kokusan Keikinzoku K.K.	Iwate-ken, Kurosawajiri-shi	A	No	20
Nichiman Aruminiumu K.K.	Toyama-ken, Higashi Iwase-machi	A	Yes	20
Nippon Keikinzoku K.K.	Shizuoka-ken, Shimizu-shi	C	No	100
Nippon Soda K.K.	Toyama-ken, Takaoka-shi	A or C	Yes	11
Nitto Kagaku Kogyo K.K.	Aomori-ken, Hachinohe-shi	A or C	Yes	1
Onoda Cement K.K.	Yamaguchi-ken, Asa-gun, Onoda-machi	B	No	100
Showa Denko Kagaku Kogyo K.K.	Kanagawa-ken, Yokohama-shi, Shin Koyasu	A	No	10
" " " " "	Nagano-ken, Shinano Omachi-shi	A or C	Yes	
<u>KYUSHU</u>				
Nippon Aruminiumu K.K.	Fukuoka-ken, Kurosaki-mura	C	No	21
Toyo Aruminiumu K.K.	Fukuoka-ken, Miike-shi	C	No	30
<u>SHIKOKU</u>				
Sumitomo Aruminiumu K.K.	Ehime-ken, Niihama-shi	A	Yes	20
			TOTAL	429

Type of Plant:

- A. Former Bayer plant converted to use non-bauxitic raw materials.
- B. Former cement plant converted to produce alumina from non-bauxitic raw materials.
- C. Unchanged Bayer plant.

Alumina Plants in Japan Proper

Plant Location	Type of Plant	Aluminum Production at Same Plant	Estimated Capacity m.t./yr.
<u>HONSHU</u>			
Kagaku K.K.	Hyogo-ken, Shikawa-shi	A	No 3,000
K.K.	Hiroshima-ken, Mihara-shi, Itozaki-machi #5310	B	No 64,000
K.K.	Iwate-ken, Kurosawajiri-shi	A	No 20,000
Aluminum K.K.	Toyama-ken, Higashi Iwase-machi	A	Yes 20,000
K.K.	Shizuoka-ken, Shimizu-shi	C	No 100,000
K.K.	Toyama-ken, Takaoka-shi	A or C	Yes 14,000
Kogyo K.K.	Aomori-ken, Hachinohe-shi	A or C	Yes 4,000
K.K.	Yamaguchi-ken, Asa-gun, Onoda-machi	B	No 100,000
Kagaku Kogyo K.K.	Kanagawa-ken, Yokohama-shi, Shin Koyasu	A	No 16,000
" " "	Nagano-ken, Shinano Omachi-shi	A or C	Yes 8,000
<u>KYUSHU</u>			
Aluminum K.K.	Fukuoka-ken, Kurosaki-mura	C	No 24,000
Aluminum K.K.	Fukuoka-ken, Miike-shi	C	No 36,000
<u>SHIKOKU</u>			
Aluminum K.K.	Ehime-ken, Niihama-shi	A	Yes 20,000
TOTAL			429,000

Notes:
 former Bayer plant converted to use non-bauxitic raw materials.
 former cement plant converted to produce alumina from non-bauxitic raw materials.
 unchanged Bayer plant.

APPENDIX 3

Magnesium Plants in Japan Proper

Company	Plant Location ^{1/}	Process	Raw Material	Estimated Capacity m.t./y
Asahi Denko Kogyo K.K.	Tokyo, Arakawa-ku, Ogu-cho 9-chome	Electrolysis	Magnesite	1,500
Kanto Denko Kagaku Kogyo K.K.	Gumma-ken, Shibukawa-shi	Electrolysis	Magnesite	500
Nippon Magnesium K.K.	Tokyo, Itabashi-ku, Shimurachogo-cho	?	Magnesite	650
Nippon Magnesium K.K.	Toyama-ken, Kaminii Kawa-gun, Osawano-machi, near Sasazu-mura	?	?	650
Nippon Soda K.K.	Toyama-ken, Higashi Iwase-machi	Electrolysis	Sea water	600
Riken Kinzoku K.K. =Nichiman Magnesium K.K., =Ube Chisso K.K.	Yamaguchi-ken, Ube-shi	Electrolysis	Sea water & magnesite	5,000
Shinetsu Kagaku K.K.	Niigata-ken, Naoetsu-shi, Kuroi	Electrolysis	Sea water	500
		Total		9,400

^{1/} All of the known plants are located on Honshu.

Magnesium Plants in Japan Proper

Company	Plant Location ^{1/}	Process	Raw Material	Estimated Capacity m.t./yr.
Kogyo K.K.	Tokyo, Arakawa-ku, Ogu-cho 9-chome	Electrolysis	Magnesite	1,500
Magaku Kogyo K.K.	Gumma-ken, Shibukawa-shi	Electrolysis	Magnesite	500
Magnesium K.K.	Tokyo, Itabashi-ku, Shimurachogo-cho	?	Magnesite	650
Magnesium K.K.	Toyama-ken, Kaminii Kawa-gun, Osawano-machi, near Sasazu-mura	?	?	650
K.K.	Toyama-ken, Higashi Iwase-machi	Electrolysis	Sea water	600
Ku K.K.	Yamaguchi-ken, Ube-shi	Electrolysis	Sea water & magnesite	5,000
Magnesium K.K.,				
K.K.				
Magaku K.K.	Niigata-ken, Naoetsu-shi, Kuroi	Electrolysis	Sea water	500
Total				9,400

The known plants are located on Honshu.

APPENDIX 4

Major Japanese Aluminum Alloy
Sheet Rolling Mills

<u>Company</u>	<u>Plant Location</u>
Furukawa Electrical Industry Co.	Tochigi-ken, Kamitsuga-gun, Nikko-machi, Kiyotaki
" " " "	Hyogo-ken, Amagasaki-shi (2 plants?)
Kobe Steel Works	Yamaguchi-ken, Chofu
" " "	Kyushu Island, Moji
Nippon Aluminum Works	Osaka
Sumitomo Metal Industry Co.	Osaka
" " " "	Nagoya

APPENDIX 5

Japanese Production, Imports and Exports of Aluminum
(metric tons)

	<u>Production</u>	<u>Ingot & Slabs</u>	<u>Imports</u>		<u>Exports</u>	<u>Apparent Consumption</u>	
			<u>Scrap</u>	<u>Total</u>		<u>Annual</u>	<u>Average</u>
1926	None	7,431	116	7,547	-	7,547	8,659
1927	"	5,825	54	5,879	-	5,879	
1928	"	9,167	170	9,337	17	9,320	7,830
1929	"	11,893	408	12,301	411	11,890	
1930	"	10,965	743	11,708	696	11,012	7,830
1931	"	2,788	2,426	5,214	211	5,003	
1932	"	4,810	3,846	8,641	336	8,305	7,830
1933	"	3,606	4,672	8,278	240	6,998	
1934	664	5,342	5,604	10,946	348	11,262	16,825
1935	4,400	9,774	4,305	14,079	1,018	17,461	
1936	7,000	9,011	1,695	10,706	872	16,834	31,945
1937	10,500	> 8,100	< 4,000	12,055	811	21,744	
1938	17,100	> 20,000	< 8,000	27,946	917	44,129	31,945
1939	23,000	> 20,000	< 8,000	28,070		51,070	
1940	35,000 (est.)	1,900	< 500	2,420		32,580	
1941	70,000)						
1942	110,000)						
1943	140,000)	See explanation at bottom					
1944	106,000)	of next page regarding					
1945	6,500)	these figures.					
	(1st quarter)						

1/ Some discrepancies in "Total" column are due to necessity of using data from two or more sources.

2/ Includes crude metal, primary shapes and scrap, but not manufactures.

APPENDIX 5 (Cont'd)

Sources of Data in Appendix 5

Data for years before 1941:

1. Aluminum Nenkan-Magnesium Soran (1939).
2. Official data of exporting countries.
3. Annual and Monthly Returns of the Foreign Trade of Japan.
4. Japan-Manchukuo Yearbook (1939).
5. The Industrial Chemist, 1941.
6. Japan Trade Studies - Special Industry Analysis No. 2 - Aluminum - Jan. 1945.
7. Kogyo Nenkan (1938).
8. American Consular Report, "The Japanese Aluminum Industry", Osaka, Japan, Sept. 30, 1939.
9. Kagaku Kogyo Nenkan (1938).

Production data for 1941 and after:

Prince Higashi-Kuni in a report to the Japanese Diet (quoted in Domei radio broadcast, Sept. 5, 1945) stated that Japanese aluminum production rose from a pre-war figure of 70,000 tons (assumed to be for 1941) to a maximum of 140,000 tons in 1943. According to the same source, aluminum output decreased after 1943 due to lack of bauxite, and only 6,500 tons were produced in the first quarter of 1945. Production for 1942 and 1944 has been estimated by extrapolation from the curve obtained by plotting reported data for 1941, 1943 and 1945.

APPENDIX 6

Japanese Production, Imports and Exports of Magnesium
(metric tons)

<u>Year</u>	<u>Production</u>	<u>Imports</u>	<u>Exports</u>	<u>Apparent Consumption</u>
1930	0			
1931	2	8		10
1932	23	13		36
1933	104	14		118
1934	141	1	4	138
1935	271	0	74	197
1936	568	n.a.	237	331
1937	1,200	n.a.	12	
1938	1,500	692 <u>a/</u>	Less than 1	
1939	2,000		2	
1940	4,000		2	

a/ Export from U.S. only.

Sources: Kogyo Nenkan (1938) p. 528.
 "Japanese-Puppet Economic Activities", Dec. 1944, published by
 Kuomintang Economic Service, Chungking.
 Mineral Industry during 1940, p. 389.
 BFDC compilation.

APPENDIX 7

Japanese Imports, Requirements and Stockpiles
of Bauxite
(metric tons)

	<u>Imports</u> ^{a/}					
	1935	1936	1937	1938	1939	1940
Netherlands East Indies	50	8,774	31,358	120,078	196,948	262,453
Malaya	355	1,123	13,241	56,643	85,736	46,033
Greece	5,250	8,000	7,300	15,000	23,959	n.a.
British India	4,481	5,327	23,748	n.a.	n.a.	n.a.
Mandated Islands	--	--	--	20,000	39,000	43,000
	10,136	23,224	76,147	211,721	345,643	351,486
Requirements ^{b/}	17,600	28,000	42,000	63,400	92,000	140,000
Apparent stockpile ^{c/} at end of year	--	--	34,147	177,468	431,111	642,597

a/ Sources:

1. The Commodity Position of Malaysia-Bauxite-Prepared by U. S. Tariff Commission for Foreign Economic Administration, Feb. 1944.
2. Japanese Trade Studies. Special Industry Analysis No. 2 - Aluminum, Prepared by U. S. Tariff Commission, Jan. 1945.
3. American Consular Report #65, "The Projected Reorganization of Japan's Aluminum Industry", Donald W. Lamm, Tokyo, Dec. 1, 1941.

b/ Calculated on basis of aluminum production figures in Appendix 5 and average requirement of 4 tons of bauxite for 1 ton of aluminum.

c/ Apparent deficit in 1935 and 1936 presumably made up by use of non-bauxitic raw materials, or by unreported imports of bauxite. No allowance for use of non-bauxitic raw materials nor for other uses of bauxite made in calculating stockpiles for subsequent years.

APPENDIX 8

Chemical Composition of Some Naturally
Occurring Aluminous Raw Materials
(percent by weight)

Composition of Some Typical Bauxites^{1/}

	<u>France</u>	<u>Guiana</u>	<u>United States</u>
Al ₂ O ₃	57-60	56-61	56-59
SiO ₂	3-5	1-3	5-12
Fe ₂ O ₃	20-25	Variable	Low
Ign. loss	11-13	29-31	27-30

Composition of Clays Used by Tennessee Valley Authority^{2/ 3/}
a Studies on Extraction of Alumina from Clays by Lime-Sinter-Soda-Leach Process

	<u>Ross Clay 1</u>	<u>Ross Clay 2</u>	<u>Rengold Clay</u>
Al ₂ O ₃	38.2	35.9	37.5
SiO ₂	43.8	42.2	44.9
Fe ₂ O ₃	0.6	1.2	0.9
TiO ₂	2.7	2.6	2.9
CaO	0.3	2.8	0.3
MgO	0.3	-	0.1
Ign. loss	14.2	15.3	13.5

^{1/} Source: Hayward, An Outline of Metallurgical Practice, 2nd ed. (1940), D. Van Nostrand Co.

^{2/} Source: Final Report on the Extraction of Alumina from Clays by the Lime-Sinter Modification of the Pedersen Process, by Copson, Walthall & Hignett, War Metallurgy Committee, Serial No. W-103, Apr. 28, 1944.

^{3/} All three samples from Holly Springs geological formation, Carroll Co., Western Tennessee.

APPENDIX 8 (Cont'd)

	<u>Composition of Japanese Clays</u> ^{1/ 2/} (percent)		
	<u>Roseki Clay</u> ^{3/}	<u>Kibushi Clay</u> ^{4/}	<u>Gairome Clay (washed)</u> ^{5/}
Al ₂ O ₃	48.16	34.02	33.84
SiO ₂	43.30	48.02	52.20
Fe ₂ O ₃	0.26	1.93	1.81
CaO	0.26	0.54	0.43
MgO	0.01	0.17	0.03
K ₂ O, Na ₂ O	1.52	0.54	0.70
Ign. loss	8.02	15.35	11.63

^{1/} ^{FEA report,} Source: /FE-121, Japanese Possibilities of Making Aluminum from Clay.

^{2/} All of these samples are from considerable deposits worked commercially for ceramic purposes.

^{3/} From Okayama-ken, Wake-gun, Mitsuishi-mura.

^{4/} From Aichi-ken, Higashi Kasugai-gun, Seto-mura.

^{5/} From Gifu-ken, Toki-gun, Tokitsu-mura.

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APPENDIX 3 (Cont'd)

Composition of Typical Clays from Manchuria,
Korea and Occupied China

Location	Type of Clay	Al ₂ O ₃	SiO ₂	Fe ₂ O ₃	TiO ₂	Ign. Loss
<u>Manchuria</u>						
Fuchow	Very hard	72.80	8.58	1.66	2.30	14.20
"	Hard	54.50	28.30	2.29	2.92	15.00
"	Soft	39.40	44.90	1.92	2.80	14.80
Kinchow	Very hard	62.90	20.66	2.62	2.05	14.31
"	Hard	40.40	42.50	1.68	1.65	14.60
Honkei	Very hard	72.12	3.74	9.24	1.84	13.96
"	Hard	54.61	15.34	14.65	1.34	13.92
"	Soft	38.28	43.30	3.85	1.50	14.64
Yentai	Very hard	60.70	14.50	10.80	2.00	13.40
"	Hard	48.80	35.70	15.10	1.80	14.80
"	Soft	40.47	44.01	0.93	1.78	13.95
<u>Korea</u>						
Location unknown	Kaolin	58.50	24.00	0.80	2.50	13.40
<u>China</u>						
Kailan, North China	Very hard	71.12	12.30	1.00	2.90	15.50
" " "	Hard	62.60	21.80	1.10	2.80	14.30
" " "	Soft	50.30	26.70	1.60	2.50	14.70
Poshan, Shantung	Very hard	70.20	11.00	1.43	2.80	14.50
" " "	Hard	54.80	17.68	10.59	2.30	14.53
" " "	Soft	40.80	41.05	1.09	2.71	14.11

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APPENDIX 8 (Cont'd)

Analyses of Korean Alunites^{1/}

Source	Seizan	Gyokubaizan 1	Gyokubaizan 2	Yozan	Kashatori
Al ₂ O ₃	31.00	36.31	37.22	36.07	35.77
SiO ₂	16.35	2.96	1.38	1.17	5.44
FeO & Fe ₂ O ₃	-	0.55	-	0.52	-
CaO	-	0.44	Trace	0.27	-
MgO	-	Trace	Trace	0.17	-
K ₂ O	6.52	9.15	9.68	9.65	7.96
Na ₂ O	1.19	0.78	1.05	2.09	1.08
SO ₃	32.31	36.82	38.02	38.47	37.17
H ₂ O	12.54	12.87	13.29	12.15	12.43
Ign. loss	-	-	-	-	-

^{1/} Source: Tyosen Kogyo, Sept. 1938.

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APPENDIX 9

Production Processes Used in the Japanese
Light Metals IndustriesALUMINA

The production of aluminum takes place in two steps: (1) production of highly purified alumina (aluminum oxide, Al_2O_3) from the bauxite or other aluminous ore, followed by (2) electrolytic reduction of the alumina to aluminum metal. These two stages are entirely independent and are frequently carried out at widely separated plants.

In the electrolytic reduction step, impurities such as silica or iron oxides present in the alumina will also be reduced and will contaminate the metal. It is consequently essential that alumina of high quality be furnished to the reduction plants. The standard Bayer process produces satisfactory alumina only from high grade bauxite^{1/} which is low in silica. Special methods have been proposed or developed for producing alumina of acceptable grade from aluminous raw materials^{1/} containing larger amounts of silica (or other impurities). Certain of these processes, believed to be of special interest to the Japanese, are here described, in addition to the Bayer process.^{2/}

1. The Bayer process. The ground (and usually dried) bauxite is heated under pressure with a caustic soda solution which converts the

^{1/} See Appendix 8 for chemical composition of some typical aluminous raw materials.

^{2/} For further details of these processes see:
FEA report, ~~EO-121~~, Japanese Possibilities of Making Aluminum from Clay, June 1944.
FEA " ,EO-165, An Analysis of Aluminum Industry Processes, Sept. 1943.
War Metallurgy Committee Research Report W-103, The Extraction of Alumina from Clays by the Lime-Sinter Modification of the Pedersen Process, prepared by TVA and issued by the National Academy of Sciences, Apr. 28, 1944.
The Aluminum Industry: Vol. II, Aluminum and its Production, by Edwards, Frary and Jeffries.

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APPENDIX 9 (Cont'd)

aluminum oxide to soluble sodium aluminate. This solution is filtered from the "red mud" containing the bulk of the **impurities**. The clarified solution is somewhat diluted with water, and aluminum hydroxide is precipitated by prolonged agitation with aluminum hydroxide **from a previous** batch. The **hydroxide** is settled, filtered and calcined in a rotary kiln to produce alumina.

Typical material requirements per metric ton of calcined alumina produced by the Bayer process are:

Bauxite	2 m.t.
Caustic soda make-up	55 kg.
Electric power	270 kwh.
Coal for drying and calcining	1.5 to 2.5 m.t.

2. Lime sinter-soda leach process. It is believed that this is the non-Bayer process most widely used by the Japanese. Clay is sintered with about twice its weight of high grade limestone to convert the alumina to calcium aluminate and the silica to calcium silicate. The resulting sinter falls to a powder **on cooling** and is then leached with soda ash solution, yielding a solution of sodium aluminate. Aluminum hydroxide is recovered from the solution by slow treatment with carbon dioxide gas and is then further treated as in the Bayer method.

In addition to equipment found in standard Bayer plants, this process requires rotary kilns such as are used in cement plants. It seems quite certain that some excess kiln capacity in Japanese cement plants has been converted to alumina production. The sinter obtained in this

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APPENDIX 9 (Cont'd)

process can be stored and transported without deterioration and consequently the sinter and leach steps can be carried out at separate locations if desired.

Raw material requirements, per metric ton of alumina produced by this process, are approximately as follows:^{1/}

Clay (dry basis)	about 3.2 m.t., depending on composition
Limestone	6.6 m.t.
Soda ash make-up	42 kg.
Fuel	70 million B.T.U.

3. Lime-soda sinter. The clay is sintered with both limestone and soda ash in a rotary kiln, converting the silica to calcium silicate and the alumina to sodium aluminate. The sodium aluminate is leached from the ground sinter by water and the solution further treated as in the lime sinter-soda leach process. The sinter produced by this method requires grinding, deteriorates rapidly in moist air and is not suitable for storage or shipment.

4. Pedersen process. The clay or shale is smelted with iron ore, coke and limestone to produce a molten slag consisting principally of calcium aluminate, and, as a by-product, high grade, low-sulfur pig iron. The cooled and ground slag is leached with soda ash solution, and the solution is further treated as in the lime sinter-soda leach process. This process is believed to be used in a Japanese plant in Korea.

5. Ferrosilicon process (referred to by the Japanese as the Uchino process). Clay or shale is mixed with coke, limestone and iron ore and charged into an electric-arc furnace where ferrosilicon and calcium

^{1/} Based on the TVA study previously cited.

APPENDIX 9 (Cont'd)

aluminate are formed. The calcium aluminate is converted to sodium aluminate by leaching with soda ash solution.

In the Suzuki modification of this process, the charge consists of aluminous shale, coke, and scrap or pig iron. On heating in an electric furnace, ferrosilicon and alumina are formed. The ferrosilicon is separated magnetically and the alumina freed from the remaining iron by treatment with chlorine. In both of these modifications, power costs are high and a market must be available for the ferrosilicon formed. Equipment of special design is also required. One of these processes is apparently in use at the Fushun, Manchuria alumina plant.

6. Alunite processes. Several processes proposed or used by the Japanese are based on alunite, a naturally occurring potassium alum (see Appendix 8). It is probable that these processes have been abandoned in favor of those based on clay or shale, partly because of the lack of uniformity and poor quality of much of the available alunite. In the processes based on alunite, an attempt is always made to recover the potassium in a form usable as a potash fertilizer.

In the Tanaka process (also called the Showa sodium process), crushed and dried alunite is suspended in water and treated with ammonia. Potassium sulfate and ammonium sulfate are recovered from the solution for fertilizer use. Alumina and silica constitute the solid residue from which the alumina is recovered by treatment with sodium hydroxide solution, followed by precipitation.

APPENDIX 9 (Cont'd)

In the Okazawa or Showa potassium process, the alunite suspension is treated with potassium hydroxide solution yielding a solution containing potassium sulfate and potassium aluminate from which both potassium sulfate and alumina are separated.

In the Sumitomo process, the crushed and dried alunite is dissolved in sulfuric acid, and aluminum hydroxide is then precipitated with ammonia and separated. The clarified solution yields potassium and ammonium sulfates.

The Asada process is also a sulfuric acid procedure, yielding aluminum sulfate which is decomposed in a muffle furnace to alumina and sulfur trioxide.

The acid processes require special equipment for handling the corrosive solutions. They are not adaptable to existing equipment in Bayer plants.

ALUMINUM

Regardless of the aluminum ore used or the procedure followed in obtaining alumina from it, all aluminum metal today is produced by passing an electric current through molten cryolite (sodium aluminum fluoride, Na_3AlF_6) in which alumina is dissolved. The alumina is decomposed into aluminum metal and oxygen. The reaction takes place in a carbon-lined steel cell which acts as the cathode. Molten aluminum collects at the bottom of the cell and is tapped off periodically and poured into ingot molds.

APPENDIX 9 (Cont'd)

Oxygen collects at the carbon anodes and, because of the high temperatures required in the process, combines with the carbon, forming carbon monoxide and carbon dioxide. About 0.6 to 0.7 ton of carbon is consumed per ton of aluminum metal produced.

The cell may be operated with a number of pre-baked electrodes or with a single Soderberg electrode in which a continuously fed paste consisting of carbon and suitable binder is fed into the electrode tube and baked by the heat of the bath. Most Japanese plants are designed for Soderberg electrodes.

If pre-baked electrodes are used, they may be purchased from a company specializing in this work or they may be formed and baked at the aluminum plant. If Soderberg electrodes are used, the paste is always mixed at the aluminum plant. Raw materials in both cases are pitch coke, petroleum coke or other source of high grade carbon reasonably free from mineral impurities, and binder.

Power requirements are high in production of aluminum, being around 10 kwh. per pound of aluminum, or about 22,000 kwh. per metric ton. As in all electrolytic processes, direct current is necessary, and aluminum plants thus usually require equipment to convert the alternating to direct current.

Consumption of cryolite is about 0.1 lb. per pound of metal produced. Native cryolite is found in commercial quantities only in one locality, Ivigtut, Greenland. However, synthetic cryolite may be made from alumina and suitable fluoride salts and this is frequently done at alumina plants

APPENDIX 9 (Cont'd)

MAGNESIUM

Several independent processes for magnesium production are in commercial use and all are known to or in use by the Japanese. These processes are: (1) electrolytic decomposition of fused magnesium chloride derived from brines, sea water, dolomite or magnesite; (2) reduction of calcined dolomite with ferrosilicon in a heated retort (Pidgeon process); and (3) reduction of magnesium oxide (obtained from brines or magnesite) with coke, followed by rapid cooling of the magnesium powder produced in a stream of hydrogen or natural gas (Hansgirg or Radenthein process).

1. The electrolytic process. This is the oldest of the commercial processes and is the most widely used method. As in the electrolytic production of aluminum, the operation takes place in two steps -- preparation of the cell feed, followed by electrolytic decomposition. These two steps are usually carried out at one plant.

Basis of the cell feed is properly dried magnesium chloride to which sodium chloride and calcium chloride may be added as needed. The magnesium chloride may be prepared by any of the following methods:

a. From brines and bitterns, by evaporation, careful separation of the magnesium chloride from sodium chloride and other salts, and drying.

b. From sea water by first adding lime to precipitate magnesium hydroxide; this is dissolved in hydrochloric acid to yield magnesium chloride, which is evaporated and dried.

c. From calcined dolomite by a wet process involving conversion of the lime to calcium carbonate and the magnesia to magnesium chloride. The calcined dolomite, suspended in water, is first treated with ammonium chloride, yielding calcium

APPENDIX 9 (Cont'd)

chloride and magnesium hydroxide and liberating ammonia. Carbon dioxide is then passed into the mixture, precipitating calcium carbonate. The resulting solution of magnesium chloride is evaporated and dried.

d. From any suitable source of **magnesia** (e.g., magnesite) by a dry process involving chlorination of heated briquettes of calcined magnesia and coke.

Electrolysis of fused magnesium chloride to yield magnesium metal is carried out on the same basic principles as in the electrolytic production of aluminum. Closed cells are used because chlorine is given off at the anodes. The chlorine is recovered and is available for reuse if needed in the process or is sold as by-product. The metal floats on the cell bath instead of sinking to the bottom. The anodes used are of the same composition as in the aluminum industry, but consumption is much smaller, about 0.1 ton per ton of metal produced.

2. The ferrosilicon (Pidgeon) process. In this basically simple process, calcined and ground dolomite is mixed and briquetted with ground ferrosilicon and heated under strong vacuum in a simple steel tube retort in a gas or oil-fired furnace. Metallic magnesium condenses in the cool end of the retort and is removed after a heating period of about ten hours, ready for remelting and casting.

At present prices of ferrosilicon in the United States, the Pidgeon process is apparently unable to compete on a cost basis with the most efficient electrolytic plants. However, the method has distinct advantages for emergency production where costs are of secondary interest. Pidgeon

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APPENDIX 9 (Cont'd)

process plants can be quickly constructed, relatively small scattered units are feasible, and the plants can be readily stopped, kept in stand-by condition and restarted.

3. The carbothermic (Hansgirg or Radenthein) process. As in the Pidgeon process, magnesium oxide is reduced to metallic magnesium by a furnace process.

Relatively pure magnesium oxide prepared by calcining magnesite or by treatment of brines, is ground and briquetted with ground coke, with or without a binder. The dried briquettes are charged into an electric furnace operated at a temperature of around 2000°C where the magnesium oxide and coke react to produce magnesium vapor and carbon monoxide gas. The reaction products must be cooled very rapidly to prevent reversal of the reaction; this is accomplished by injecting a stream of inert gas (hydrogen or natural gas) into the electric furnace. The magnesium condenses as a fine powder (somewhat contaminated with carbon) which must be sprayed with oil, briquetted and dried. The briquettes are then heated at about 1000°C in a retort under vacuum. The magnesium is vaporized in the hot section of the retort and crystallizes in the chilled top, from which it is periodically removed and melted for casting into molds.

No data are available for comparing plant investment or metal production costs with the other processes described. Close technological control is necessary because of the operational hazards involved.

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APPENDIX 10

Employment and Production Rate in U.S. Light Metals Industry

	<u>Employment 1/</u>	
	<u>January 1944</u>	<u>December 1944</u>
Aluminum		
Bauxite mining, domestic	2,500	2,200
Alumina plants	7,000	4,800
Reduction works	15,000	9,400
Secondary smelters	3,000	2,700
Foundries	70,000	49,500
Sheet and foil mills	20,000	16,300
Forge shops	15,000	10,000
Other plants	<u>17,000</u>	<u>12,000</u>
Total aluminum	149,500	106,900
Magnesium		
Ingot plants	18,000	5,100
Foundries	29,000	22,200
Other plants	<u>2,000</u>	<u>1,400</u>
Total magnesium	49,000	28,700
Total light metals	198,500	135,600

Production Rates

	<u>January 1944</u>		<u>December 1944</u>	
	Total pro- duction, m.t.	Tons per worker per year	Total pro- duction, m.t.	Tons per worker per year
Aluminum ingots, primary 2/	76,894	41.9 4/	42,227	35.7 4/
Aluminum ingots, secondary 2/	19,248	87.7	22,680	100.8
Magnesium ingots, primary 3/	18,565	12.4	3,861	9.1

- 1/ Employment data from estimates by Aluminum and Magnesium Division, War Production Board.
- 2/ From data reported by War Production Board.
- 3/ From data reported by Defense Plant Corporation.
- 4/ Employment in both alumina and aluminum plants used in calculating tons of primary aluminum per worker.

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APPENDIX 11

Japanese Exports of Aluminum Manufactures
by Values 1/

<u>Year</u>	<u>Aluminum Ware</u> <u>1000 yen</u>	<u>Aluminum Sheet</u> <u>1000 yen</u>	<u>Total</u> <u>1000 yen</u>
1929	85.6	482.6	568.2
1930	706.6	744.3	1,450.9
1931	342.0	222.6	564.6
1932	410.5	478.5	889.0
1933	1,126.9	376.5	1,503.4
1934	1,930.7	534.2	2,464.9
1935	1,660.9	1,653.7	3,314.6
1936	1,727.5	1,301.1	3,028.6

1/ Does not include exports to Korea and Formosa.

Source: The Mining Magazine, London, Vol. 59, #2, p. 83 (1938).

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Chief Director --	one
Directors --	several
Inspectors --	several
Members of the Board of Trustees --	several

Not more than two vice-chief directors may be established in a Control Association depending on the provisions of the articles of the association, in addition to the officials mentioned in the preceding paragraph.

Article 44 --

The chief-director represents the Control Associations. He controls and guides the industry concerned and operates the business of the Association.

The president of a Control Society appoints the chief-director of a Control Association, which is under the jurisdiction of the former, from among those who have experience in or knowledge of the industry concerned. When there is no connected Control Society, the competent Minister appoints the chief director of a Control Association from those persons who have experience in or knowledge of the industry concerned.

The chief-director chosen in accordance with the provisions of the first part of the preceding paragraph shall not take office until the approval of the competent Minister has been obtained.

Article 45 --

The provisions of Paragraphs 2, and 4 to 6, Article 13 and from Paragraph 3 to 5 of Article 14 are to be applied to the vice-chief directors, directors, inspectors and trustee members of the Control Association.

Article 46 --

The terms of the officials of the Control Association are as follows:

Chief director --	3 years
Vice chief-directors --	"
Directors --	"
Inspectors --	2 years
Trustee members	"

The chief-director may dismiss the vice-directors or directors of the Association during their terms of office if he considers this act necessary.

The dismissal mentioned in the preceding paragraph has no effect unless the approval of the competent Minister has been obtained.

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Article 47 --

The president of a Control society may dismiss the chief director of a Control Association when the latter's conduct violates the ordinance or the decisions made by the administrative government in accordance with the ordinance, or when the chief-director is considered unfit for the control and management of the industry concerned.

The dismissal mentioned in the preceding paragraph has no effect unless the approval of the competent Minister has been obtained.

Article 48 --

The Control Association may convene a general meeting of representatives in accordance with the Articles of the Association; this meeting to take the place of the general meeting.

Articles 28 and 29 are to be applied to the general meeting of the representatives mentioned in the preceding paragraph.

Article 49 --

The Control Association is required to register according to the provisions of the Cabinet decree.

The items which should be registered according to the provisions of the preceding paragraph, may not be applied to a third party unless he has been registered.

Article 50 --

The regulations of Paragraph 2 of Article 8, of Articles 10, 11, 17 to 26 and 28 to 34, of Paragraph 1 and 2 of Articles 35 and also Paragraph 1 of Article 36 are to be applied to the Control Association. The government's administrative office shall take the place of the competent Minister and the ministers connected with the industry concerned. Exceptions are made in the provisions of Paragraph 2 of Article 10 and Paragraph 1 of Article 36.

Chapter IV

Miscellaneous Regulations

Article 51 --

When the enquiries, reports, inspections, investigations and orders concerned are of military importance, the Minister of Army or Navy will take the place of the Ministers connected with the industry concerned or the government's administrative office and the competent Minister, mentioned in Paragraph 2 of Article 17,

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Paragraph 1 of article 31, Article 32 (including the preceding articles to which the mentioned provisions are applied) and Article 33 (including the preceding articles to which Article 33 is applied, the same applying correspondingly to this article and Article 52).

When the Minister of Army or Navy intends to give an order according to the regulations of Article 33 he must discuss the matter with the authorized Minister of the Control Society or of the Control Association.

Article 52 --

If the authorized Minister of a Control Society or of a Control association intends to give an order under the provisions of Article 33 he shall confer with the Minister of Army or Navy if the order concerned should affect military matters.

Article 53 --

In Chosen, Taiwan, Karafuto and in the South Sea Islands (hereinafter referred to as the "Outer-Territories") the Chosen governor-general, the Taiwan governor-general, the heads of the Karafuto government office and of the South Sea Islands Government office shall take the place of the competent Minister, the Ministers directly connected with the business concerned and the authorized Ministers of the Control Society or of the Control Associations mentioned in this ordinance.

In the case of a Control society composed of members who fall under one of the sections of Article 7 and who live in the Outer-Territories and of persons who live in Japan proper, the Chosen Governor-general, the Taiwan government, the Heads of the Karafuto government office and of the South Sea Islands shall take the place of the competent Minister, the Ministers connected with the control organizations concerned, and the authorized ministers of the Control Society and Control Associations only if the cases are concerned with the Outer-Territories regardless of the provisions of preceding articles.

Articles 54-46: (omitted) Technical details of operation of control mechanism in Outer-Territories.

Supplementary Rule:

This ordinance shall be enforced from the first of September, 1941.

Source: Horei Zensho (Complete Collection of Laws and Ordinances), 1941, pp. 612-620.

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APPENDIX VI

"Imperial Ordinance covering amendments to the Essential Industries Organizations Law (Juyo Sangyo Dantai Reichu Kaisai Chokurei) dated July 4, 1945.

- "(1) In Article 1, under 'Control', add the words, 'and the necessary administration for it.'
- "(2) In Article 4, after the words, 'to contrive for the carrying out of generalized control', 'and to carry out the necessary administration for it.'
- "(3) In order to achieve their objectives, the control associations will conduct the following tasks:-
 - "(a) Participation in the Government planning regarding production and distribution in the industries concerned, and the demand and supply of material, capital, and labor to be used in these industries, and in other Government planning regarding the industries concerned.
 - "(b) Guidance of control regarding production and distribution in the industries concerned; also guidance of control of enterprises affiliated with such industries which are run by (control associations) members or organizations of such members.
 - "(c) Firm establishment and adjustment of the industries concerned.
 - "(d) Cooperative purchasing of materials needed by members of organizations of members in enterprises affiliated with the industries concerned.
 - "(e) Cooperative marketing of materials produced by such members of organizations in enterprises affiliated with the industries concerned.
 - "(f) Cooperative calculation of the profit and loss of affiliated enterprises.
 - "(g) The making of provisions for the protection of the enterprises affiliated with the industries concerned, and for the welfare of the workers, and other necessary provisions pertaining to the operation of the industries concerned.

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- "(h) Inspection of the enterprises affiliated with the industries concerned and the auditing of their accounts.
- "(i) Providing for the development of affiliated enterprises, by such means as improvement of techniques, increase in efficiency, unification of system, and reform in administration.
- "(j) Investigation and research regarding the industries concerned.
- "(k) Making plans other than contained in the above clauses which are deemed necessary in carrying out the objectives of the control associations in their control of the industries concerned.
- "(4) Clause 6 in Article 14, and Clause 4 in Article 15 will be eliminated.
- "(5) Clause 2, Article 22: By specification in the articles of association, the president of a control association may select a deputy (dairinin) who will have authority to carry out, in place of the president, all judicial or nonjudicial matters in relation to the duties of the business office of the control association.
- "(6) A bona fide third party may not be opposed by application of the limitations placed on the authority of the deputy in the preceding clause.
- "(7) Clause 2, Article 27: If the president sees that any action is detrimental to the common interest being carried out by a corporate member of the control association of one of the industries involved, or by the secretary or auditor of a corporation made of a group of members, or by a member who audits the conditions of the (word missing) assets, and if such action is found to be especially hindering in the enforcement of control, then, upon the authorization of the Minister concerned, the president can order the release of that person through the corporation concerned.
- "(8) Clause 3, Article 35, and Clause 2 of Article 36 will be eliminated.
- "(9) Clause 2, Article 36: It is necessary that the control associations carry out a registration as specified by these provisions.

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- "(10) By the stipulation of the previous clause, if the matters which should be registered are not those which (word missing) after registration, this cannot be used against a bona fide third party.
- "(11) In Article 38 under 'Article 27' add "Part two of Article 27'.
- "(12) In the principle part of clause 3, in Article 41, change the words 'or Article 27' to read (Article 27 or part 2 of Article 27). Make the same change in the conditional clause of the same Article.

"By-Laws:- This ordinance will be enforced from the date of promulgation. As for the registration which the control associations must carry out within the definitions of the enforcement of this ordinance, this will be specified by a Cabinet ordinance." (Tokyo, DOMEI, in Kana to G.E.A., July 3, 1945, 6:17 a.m. EWT).

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APPENDIX VII

Transfer of Administrative Authority Law 1/
(February 18, 1942, Law No. 15)

(Established in accordance with Article 18 of the National Total Mobilization Law)

Article 1. Transfer of the government authorities.

The Government transfers to the Iron and Steel Control Society, to the Coal Control Society and to other Control Societies (established on basis of the Major Industries Organization Ordinance) National Policy Companies to Corporations (Eidan) and to other organizations, governmental authority to grant authorizations and permissions arising from the provisions of the National Total Mobilization Law, the Exports and Imports Temporary Management Law, and various other laws and regulations, except the authority which belongs to the administrative policy of the Government. Matters concerning allocations of production and distribution, supply of materials, which are decided by imperial ordinances, are to be conducted by the Control Organizations.

Article 2. Guarantee for execution of authority and the fixing of official responsibility.

For the purpose of safe guarding the authority of the control organizations, they are considered as government agencies. Any violation of their orders is considered as a violation of the particular law or regulation upon which their order is based. The officials of the control organizations are considered as government officials, and any negligence in fulfilling their duties is to be considered the same as negligence on the part of government officials.

Article 3. Necessary matters related to the performance of the governmental authorities by the Control Organizations will be decided by Imperial ordinance.

Article 4. Date of enforcement will be decided by imperial ordinance.

Source: Keizai Tosei-ho Nempo (Control Law Annual Report)
Series I Vol (January-March, 1942 pp. 38-40)

1/ This is an abstract based on an exposition of the law.

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APPENDIX VIII

METAL INDUSTRY CONTROL SOCIETY (ABSTRACT)

The Metal Industry Control Society was established 15 January 1942 to deal with metal goods and raw materials, such as electric wire, copper, aluminum, magnesium and its compound, metal plates, pipe, metal bars, wire and other metal articles. Twenty-seven companies, two control unions and six industrial unions were designated by the Ministry of Commerce and Industry as members of the society. The purpose of the society is to plan a centralized control administration for the metal industry and to cooperate in accomplishing the national industrial policy. Therefore, the control society has the right to participate in Government plans in order to direct and adjust the business of all members of the society.

The characteristics of the society are as follows: 1) The members of the society are all industrial companies dealing with electric wire, pressed wire and stretched wire. The electric wire division and the pressed and stretched wire divisions deal with copper and aluminum. There are two or three other member industries which deal with different materials and goods in the society 2) The business of the society is its control of manufactured metal goods, such as metal plates, pipes, bars and other metal articles.

The society is planning to investigate working conditions of the factories at the end of November as a means of carrying out a concrete control of all activities in the future.

Finance, technical labor, materials, production and South Seas policy committees have been established to coordinate activities of the members of the society and to conduct business effectively for the members of the society.

The society is planning to work more closely with related Government agencies and organizations for the purpose of establishing an emergency control production plan in accordance with national economic policies. For this reason, the Metal Pressing and Stretching Supply Co., Inc. (Assen Kinzoku Haikyu Kabushiki Kaisha) and the Electric Wire Supply Co., Inc., (Densen Haikyu Kabushiki Kaisha) have established a rationalized distribution policy to society members. The Metal Pressing and Stretching Supply Co. has been directing all business activities and the Tosai Copper Sale Company will start its business on 1 May 1942. The Electric Wire Supply Co. will start its business on 1 August 1942.

The Society established the materials committee as a centralized supply consulting organization to direct the distribution of materials to the members. The society plans to hold consultations on supply and on procuring materials for the society members. Its concrete policies are as follows:

- 1) Investigation of the amount of essential materials in stock. The society investigated the total amount of all essential materials such as copper, aluminum, zinc, pig-iron, lead, turpentine, carbon block, artificial silk thread, cotton thread and zinc wire, in warehouses and factories for the past year and the average quantity used monthly in order to make good use of all materials.
- 2) Complete control of all materials for local distribution. The society is trying to control all materials such as nails, steel wire, cement, machine oil, needles and pocket ledgers for local distribution.
- 3) Simplification of regulations. The society is planning to simplify the regulations on the control of all materials.
- 4) Application of left-over materials. The society is planning to exchange materials among members to supplement and make use of all materials in the warehouses. An investigation card is now being worked out to check on all materials on hand and to plan for their proper use by society members in order to simplify all business transactions for the society.

The technical committee of the Electric Wire and the Pressed and Stretched Wire Divisions are cooperating in the following policies: 1) the investigation and research of factory establishments and their techniques; 2) investigation of patents; 3) investigation of manufacturing efficiency; 4) standardization of goods, materials and control regulations; 5) investigation of the needed quantities of materials; 6) plans for standard plants; 7) research on improved working techniques in factories, training in labor techniques, development of working efficiency, establishing of prices, improvement of technical administration and inspection of goods. The society has completed technical inspection of 64 types of electric wires and 126 patents on pressed and stretched wire.

The society has been studying labor distribution, administration, wages, hours, welfare establishments and necessities for the daily living of the workers in order to solve all important and urgent problems connected with labor. The Pressed and Stretched Wire Division is now studying the practical problems of labor distribution to increase labor efficiency.

The society is now investigating the business condition of society members to strengthen and rationalize production, by utilization of all metal industries' working efficiency and improving their techniques.

The South Seas Policy Committee is working on a policy for distributing necessary metals to places that need them in the South Seas. The society is also preparing to investigate necessary labor,

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fuel, and the required quantity of materials for the South Seas.

The control regulations of the Metal Industry Control Society have not been approved because the business law which includes approved of regulations for controls societies has not been established. Regulations of the society will be approved around the middle of September. Practical activities of the society are expected to start immediately after approval of the regulations has been granted.

SOURCE: - Toseikai Nenkan, 1943 p. 149.

APPENDIX IX

Control Regulations concerning Control Association of Hokkai Warehouse Enterprises. The regulation is effective from 20 June 1944.

1. Control of warehouse enterprises, Article #14 of the Association Regulation, will follow this Control Regulation.
2. Within two months of application, members must submit statement containing the following items:
 - a. Resume of employer's personal history and financial background.
 - b. Business regulation.
 - c. Sample of warehouse bonds.
 - d. Rates for storage, loading, and unloading.
 - e. Name and address of business office.
 - f. Chart of warehouse inspection.
 - g. Inspection chart indicating the state of management.
 - h. Statement of other business besides the warehouse, owned by the member.
3. Members must submit statement without delay to include:
 - a. Monthly report of articles received, released and remaining in storage.
 - b. Unpaid monthly warehouse bonds.
 - c. Financial list of loans, business-reports, profits and loss statements, also statements concerning the disposal of profit.
 - d. Monthly report on utilization of warehouse.
 - e. Yearly report of business conditions.
4. Members must report to the Association under the following circumstances:
 - a. When duties assigned to the Association are completed,
 - b. When business location or office is changed or when name and address is abolished or changed.
 - c. When any regulation and executive personnel is changed.

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- d. When stock payment is collected and new stocks are issued.
 - e. When Warehouse Regulation Article #1 is granted or annulled.
5. Members must submit certified documents concerning:
 - a. Handling, obtaining and conserving of necessity articles.
 - b. Hiring of labor and working conditions.
 - c. Methods of raising capital.
 6. When necessary, the Association shall reform management, promote efficiency and carry on research for technical operations.
 7. When necessary, the Association shall subsidize and contribute money to improve conditions for its members.
 8. In time of emergency or disaster, members must cooperate and take measures to aid such victims.
 9. Members must obey the rules and regulations established by the Associations.
 10. All statements in documents submitted by members must be true and accurate.
 11. After obtaining permission from Government, the Association may establish, suspend, abolish, transfer, consign, entrust, or combine the managements of various warehouse enterprises of its members.
 12. Members must report in advance concerning opening, abolishing, transferring, uniting, or dispersing of their warehouse enterprises to the Association.
 13. When considered necessary to control the Association, Government may order and instruct the setting up of machineries, expanding of warehouses, changing, suspending, transferring and renting of members' enterprises.
 14. Members must report to the Association in advance on the purchasing loading and unloading of machineries, establishing of warehouses, enlarging of company, changing, suspending, abolishing and transferring of business.
 15. When considered necessary, the Association may make suggestions on the weight and number of commodities handled and methods of obtaining and conserving necessary articles.

REGULATION CONCERNING LABOR AND STORAGE:

16. Except in special cases, the Association may give permission to receive goods for storage.
17. The Association may, when necessary, receive goods for storage, under a joint contract but it may also give portions of goods to other members for storage.
18. When the Association receives goods for storage under a joint contract, it may distribute them to designated members. When designated members receive the goods, they must perform their duty according to regulations.
19. Designated members must agree to receive their quota of assignment according to the rules of the Association, but when members cannot accept the amount assigned them, they must give reasons for not doing so and must report to the director and obtain his approval.
20. When considered necessary, the Association may request any member to accept for storage any assignment that it may give to the member.
21. When necessary, the Association may transfer goods placed with one member to another member as decided by the Chief Director.
22. When necessary, a conference may be held with the chief director of the Association to discuss matters concerning the development of warehouse enterprises:
 - a. To establish or purchase warehouses.
 - b. To decide on priority for receiving goods for storage.
 - c. To refuse or limit goods for storage.
 - d. To cancel contract for storage or to return goods.
 - e. To insure goods for storage.
 - f. To decide on methods of loading and unloading.
23. When necessary, the Association may direct the management of labor and adjust the wages of labor.
24. The Association may decide on the forms of bonds or certificates for warehouses.

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CONTROL OF RATES OR FEES FOR STORAGE:

25. The Association shall decide on the rates for storage and the methods of loading and unloading. In special cases where rates are increased or decreased, approval must be obtained by the members from the Association.
26. To improve warehouse enterprises, the Association may order a part of the members or all of its members to accept special rates for storage or rent for warehouses.
27. Members who accept the new rates may combine together in handling the special rates and rent of warehouses.
28. Members desiring more detail on this regulation may obtain further information from the director.

SOURCE: - Kampo, June 29, 1944.

Appendix X

Electrical Engineering Control Society in Japan (abstract)

The Electrical Engineering Control Society has been established in conformity with the principle of national defense which deems it necessary to promote electrical engineering to its highest point of productivity.

This Society came into existence through the Important Enterprise Act of the Japanese Government. The general headquarters of this society are in Tokyo, and branch offices may be established in various cities if the head of this Society considers it necessary. Any announcement of the Society will be considered as an official announcement.

The duties of the Control Society may be listed as follows:

- 1) To produce and allocate electric machinery in accordance with the general economic plan of the Government.
- 2) To guide and supervise the production of and allocation of articles made by member organizations.
- 3) To plan for the supply of raw materials, capital, manpower, fuel, and other establishments.
- 4) To reorganize the whole system of electrical engineering and the manufacture of electrical machinery.
- 5) To determine the prices of articles produced.
- 6) To devise means for the advancement of technique and efficiency in electrical engineering.
- 7) To concern itself with matters of investigation and research.

The organization of the Control Society consists of one chief, one deputy chief, one chairman of the board of directors, several directors, several supervisors, and several advisors. The chief of the whole society is appointed by the Minister of Commerce and Industry; the deputy chief, the chairman of directors, the directors, and the advisors, are appointed by the chief on the basis of their experience and academic background. The terms of tenure are: Three years for the chief, deputy chief, chairman of the board of directors, and directors, and two years for the supervisors and advisors.

The office of the advisors is mainly for giving advice to the chief who is concurrently head of the advisory board. The board convenes at any time at the suggestion of the chairman. The general affairs of the Control Society are handled by the office of Administrative Affairs, the head of which is the chairman of the board of directors, who administers under the guidance and supervision

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of the chief of the Control Society. The Office of Administrative Affairs maintains the following 5 departments:

- 1) The department of general affairs.
- 2) The department of electricity.
- 3) The department of communications.
- 4) The department of natural resources.
- 5) The department of investigation.

Toseikai Nenkan, Tokyo, February 1943, pp. 177-185.

Appendix XI

Electric Machine Control Society (Abstract).CHAPTER I

- Article 1. To cooperate in the realization of the imperial policy in regard to the maintenance of the electric machine business, the society shall aim at establishment of an electric business which will secure the sale and manufacturing of electric machines, such as: steam engine boiler, steam engine turbines, water turbines, and telegraph instruments.
- Article 2. The Society shall be established according to the Important Industry Corporation Law and shall be called the Electric Machine Control Society.
- Article 3. The head office shall be in Tokyo. If the president deems it necessary, branch offices shall be established in important cities.
- Article 4. The announcement of different matters of the Society shall be made through the official gazette.

CHAPTER II

- Article 5. The Society shall be composed of members who are in the business of electric machines and in corporations organized by electric machine business enterprisers. The Minister of Commerce and Industry shall have the right of designating members to this society.

CHAPTER IIIBusiness and its practices

The following items shall be practiced to accomplish the aim of the society.

- A. The society shall participate in the government plan for the supply and distribution of motor power, fuel, labor, power, and capital equipment for the electric machine business.
- B. The society shall control and supervise matters concerning the production and distribution of electric machines.

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- C. The society shall control and supervise the supply and distribution of necessary data for the various electric machine business and enterprises.
- D. The Society shall manage the problems of security and arrange the systems for the electric machine business.
- E. The society shall manage matters concerning the price of electric machines.
- F. The Society shall standardize electric goods, improve administration, promote efficiency, and elevate technical skill in connection with the electric machine business.
- G. The Society shall conduct research and investigation pertaining to electric machine business.
- H. The Society shall investigate the business of the members and members' corporations
- I. The Society shall handle other necessary matters that are related to the accomplishment of the aims of the society.

Article 7. The control over the business of the members or members' corporation shall be done according to fixed control regulations.

Article 8. Special business matters of the Society shall be conducted separately.

CHAPTER IV.

Officials

The Society shall have the following officials: one president, one chairman of the board of directors, a few directors, a few inspectors, a few councillors. If necessary, the society shall have one vice-president.

Article 10. The president shall control and supervise the business of electric machines on behalf of the Society. The vice-president shall assist the president and in the president's absence he

shall act for the president.

- Article 11.** The president shall be appointed directly by the Minister of Commerce and Industry. The president shall choose men of experience for the other offices with the approval of the Ministry of Commerce and Industry. Only the inspectors shall be elected on the agreement of more than half the councillors.
- Article 12.** The terms of office shall be as follows: president 3 years; vice-president, 3 years; chairman of the board of directors, 3 years; members of the board of directors, 3 years; inspectors, 2 years; and councillors, 2 years.
- Article 13.** The president, vice-president, chairman and members of the board of directors shall not participate or undertake any other business without the approval of the Minister of Commerce and Industry.

CHAPTER V.

- Article 14.** Meetings shall be of two kinds, general and committee meetings.
- Article 15.** The general meetings shall be of two kinds, regular general meetings and temporary general meetings.
- Article 16.** The president shall make decisions on the following matters with the approval of a general meeting:
- A. Changes in the articles of the Society;
 - B. Budget and income expenditure;
 - C. Method of collecting taxes.
- Article 17.** The president shall report on the business of the society and he shall have the inspectors report on financial matters of the society.
- Article 18.** Committee Meetings shall be held whenever the president deems it necessary. The president

shall preside as chairman of the committee meetings.

CHAPTER VI

Bureau of Business:

- Article 19. A business bureau shall be established in the society to manage the business affairs.
- Article 20. The chairman of the board of directors shall control and manage the business bureau under the direction of the president.
- Article 21. The regulations concerning the officials and employees shall be made up separately.
- Article 22. The society shall impose a tax upon the members.
- Article 23. The society shall get the approval of the Minister of Commerce and Industry, whenever the Society has new business to deal with. Whenever necessary the Society shall impose a special levy upon its members.
- Article 24. The levy shall be collected according to the special regulations set for taxes.
- Article 25. The fiscal year shall begin on 1 April and end on 31 March of the following year.

CHAPTER VIII

Dissolution and liquidation.

- Article 26. Dissolution of the Society shall be made by the order of the Minister of Commerce and Industry.
- Article 27. The liquidator shall be chosen by the court of justice which shall be served the notice by the Minister of Commerce and Industry.
- Article 28. The liquidator shall have the right of managing the liquidation on behalf of the Society.
- Article 29. The liquidator shall decide on the method of liquidation and property disposition.

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Article 30. Even after a dissolution, if it is found necessary, the Society shall collect any necessary levy from the members with the approval of the court, to settle the debts of the Society.

CHAPTER XV

Fine for violating the regulations.

Article 31. Any member who violates these regulations shall be charged with a fine of 5,000 yen.

SOURCE: - Toseikai Nenkan, 1943, Part II, 177-180

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Appendix XII

Abstract of Regulations Governing the Establishment of a Warehouse Control Society (Effective 1 May 1944).

In order to increase transportation efficiency and to harmonize the distribution of essential resources, the proposal to establish the Warehouse Control Society was presented by the Minister of Transportation, that this establishment should be rushed by appointing a committee to prepare and to finish within the month of April so as to operate it from 1 May.

I. The Establishment of Control Society.

- 1) Control Society should be established in order to control general warehouses of six great harbors.
- 2) The affairs of control society should be of enterprising warehouse business. New equipment may be arranged to protect warehouses and their establishment with the headquarters in Tokyo and branch offices in important areas.
- 3) Private Warehouses or business warehouses should be rented or commissioned as ordered by the control society.
- 4) The readjustment order should be issued by the control society when warehouse is to be rented.
- 5) Official or public warehouses will be lent to the control society.
- 6) The Control Society should arrange with the Japan Harbor Transportation Association, small scale land transportation business, and exchange corporations to maintain closer mutual connections.

II. The establishment of Control Union and Control Society.

- 1) In the district zones under local administrative society, Control Union should be organized in parallel with the Control Society. The function of this union should be to undertake the control activities of warehouse business under the established regulations of commercial union.
- 2) Under the readjustment of control society and control union, the whole nation's warehouse business may be controlled when the essential industry demands it.

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3) The president of Control Society automatically becomes the head of all control associations and he selects other personnel of the society.

4) The Control Society should encourage cooperation among all warehouse businesses in order to increase the efficiency of transportation power to insure the complete unification of harbor transportation and all small scale land transportation business.

III. The Purposes of Warehouse Control Society.

1) To bring the maximum efficiency of transportation to the six great harbor warehouses and to decrease the procrastination of harbor freight work.

2) To enlarge the utility of sea routes for unified and carefully planned transportation.

3) To see that the warehouse business men do not keep or distribute too freely the essential resources, but manage them under the orders of the control society. In addition, to protect the essential resources from the danger of enemy air raids.

4) To unify the regulations of small scale land transportation as of 1938, and of sea transportation as of 1940, so that the function personnel and enterprise of transportation may be closely connected and thorough.

The control society becomes the legal owner of all six great harbor warehouses and the control society acts under the orders of the Government in distribution and custody of the essential goods.

The Warehouse Control Society shall be operated from 1 May, with the capital of 20,000,000 yen. If it is necessary for a central organization to control a nation-wide association, the Government will act upon it.

APPENDIX XIII

Control of Electrical Engineering Industries

The nine electric power distribution companies of the country are under the complete control of the state but there has been no particular control over the 5,000 electrical engineering industries for the nine electric power distribution companies and their consumers. Their work is to connect electric lines to the homes and make small extension lines.

The Electric Bureau of the Ministry of Munitions is now going to systematize the 5,000 electrical engineering industries by aiming at the following items:

- 1) Efficient utilization of labor and materials.
- 2) Closer cooperation between the engineering industries and the nine companies.
- 3) Absolute security for controlling the electric lights during an air raid.
- 4) Mobilization of employees for defense during an air raid.

The essential points for adjusting the electrical engineering industries are as follows:

- 1) To establish nine electrical engineering industry stock companies or one to each area in which the nine electric power distribution centers are located.
- 2) To organize local control associations, which will be made up of electrical engineering stock companies in each district, such companies must have more than 20 engineers and their engineering contracts must add up to more than 100,000 yen a year.
- 3) To organize a central control society whose members will be the local control associations and electrical engineering industries whose contracts add up to more than 1,000,000 yen a year and whose employees consist of more than 1000 people.
- 4) To reorganize the present electrical industry associations according to the area in which they are located.
- 5) To require the local control associations to become

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members of the local civil Engineering construction control association, and to require the Central Electric Control Society to become a member of the Japan Civil Engineering Construction Control Society.

SOURCE: Mainichi Shimbun (Tokyo) 4 April, '44.

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Appendix XIV

Abstract of Regulations on Lumber and Charcoal Production.

1) The local governor shall designate the acreage of standing trees to be cut, the time for cutting the trees, the time for the sale of the lumber and other necessary items for the process of cutting down trees on the mountains.

2) Also the local governor shall record the place and acreage of the standing trees, the time of the cutting, the price and time of the sale of such lumber and other necessary items in the document of his order for cutting down the trees.

3) The ceiling price of the standing trees shall be the same as the ceiling price stated in the seventh article of the Price Control Order, which is the price of lumber with all the expenses of cutting, shipping and other labor excluded.

4) Local governor shall designate the time, the methods of production and other necessary items in his order for charcoal production, and he shall also designate the time, price quantity, time of shipping, place of shipping and other necessary items in his order for the sale of charcoal.

5) The Charcoal Supply Adjustment Regulation will be abolished and this order shall become effective 29 June 1944.

SOURCE: Kampo, 29 June 1944.

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Appendix XV

Pit Wood Control Association

The Pit Wood Control Association (Komoku Tosei Kumiai) was established in Northern Kyushu and started its control business transactions 1 July 1944 in order to 1) control the supply of wood used for supports in order to fill the demands of coal miners in 20 prefectures around Northern Kyushu, 2) lower the expenses of the wood producers, 3) establish a sum of 7,500,000 yen as an encouragement fund to help wood producers transport their wood from the place of production to the consumer and distribute all necessary working materials to the wood producers. Three-fifths of the coal produced in Japan comes from this area.

The establishment of a Pit Wood Control Society has been expected in Hokkaido, Eastern Japan and Osaka since the establishment of this association in Kyushu.

SOURCE: Asahi Shimbun, 16 July 1944.

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Appendix XVI

Regulations of the Woolen Goods Control Society

I. General Regulations

- 1) The Purpose of this society shall be to support the national policy of controlling all woolen goods business in order to strengthen the national economic system.
- 2) This society shall be called the Woolen Goods Control Society and shall be based on the Decree of Essential Industry.
- 3) The headquarters of this society shall be located in Tokyo and branch offices shall be established in other cities.
- 4) The announcement of this society shall be revealed in the gazette.

II. Members

- 5) This society shall be composed of all woolen business firms which have been approved by the Minister of Commerce.

III. Work and its execution

- 6) In order to fulfill the aim of regulation No. 1 the following work shall be done by members:
 - a) To aid the government in acquiring material, capital and labor for the increase of wool production.
 - b) To direct and control the production and distribution of the woolen industry.
 - c) To control the supply of capital, material and labor for the woolen industry.
 - d) To fix the price for woolen goods.
 - e) To promote planning the woolen industry.
 - f) To improve the skill and to increase the efficiency of the woolen industry.

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- g) To make surveys and do research concerning the woolen industry.
 - h) Besides the above items, other necessary works for the benefit of this society will be required.
- 7) Control regulations of this society shall be recognized by the Minister of Commerce.

The president shall consult with the councillors in order to formulate control regulations.

- 8) Essential affairs of this society shall be executed by the president.

IV. Officers

- 9) This society shall have one president, one chief director and a certain number of directors, superintendents and councillors.
- 10) The president shall be recommended through a member of the Civil Service Committee and shall be appointed by the Ministry of Commerce.

The chief director and directors shall have good knowledge of and experience in the woolen industry and their appointments shall be approved by the Minister of Commerce.

Councillors and superintendent should have experience in the woolen industry and their appointments shall be approved by the president.

- 11) The appointments of the president, the chief director and the directors shall be for three years each and of the superintendents and councillors, two years each. If the president wishes to resign during his incumbency his resignation shall be approved by the Minister of Commerce.
- 12) The president, the chief director and directors cannot engage in other business except with the approval of the Minister of Commerce.
- 13) The president shall direct and control all essential

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affairs of the woolen industry and other activities related to this society.

The chief director and directors shall assist the president in all works and act for him in his absence.

Superintendents shall examine and audit the financial status of this society.

Councillors shall answer and give opinions to, the president upon request.

V. Conferences

14) There are two kinds of conferences, namely:

- a) general conference
- b) councillors conferences.

The general conference shall be composed of all members of this society while the councillors conference shall be composed of only the councillors of this society.

15) There are also two kinds of general conferences namely:

- a) ordinary conference
- b) emergency conferences

The ordinary conference shall be held in May of each year, while an emergency conference may be called whenever it is needed. Conferences shall be called by the president.

16) The president shall consult all members at the conference concerning any change in the regulations or the financial budget of the society.

17) At the annual ordinary conference the president shall report on all affairs and conditions and the superintendents shall report on the financial statements of the society.

18) A councillors conference may be called at the will of the president. The president shall be the chairman of the councillor's conference.

VI. Bureau of General Affairs

- 19) A Bureau of General Affairs shall be set up to handle all general affairs of this society.
- 20) The chief director shall be the head of the Bureau of General Affairs and shall be under the direction and supervision of the president.
- 21) Several departments shall be created in the Bureau of Affairs and they shall be headed up by the directors.

VII. Accounting

- 22) The fiscal calendar of this society shall be from April 1 of one year to March 31 of the following year.
- 23) All members shall pay a membership fee.

The membership fee and the method of collecting it shall be determined by the president. He shall consult members opinions.

VIII. Dissolution and Liquidation

- 24) This society may be dissolved by the order of the Minister of Commerce.
- 25) The liquidator shall be selected by the court.
- 26) The liquidator shall have full authority to represent this society.
- 27) The liquidator shall determine the method of liquidating and handling property which shall be approved by the court.

IX. Penalty

- 28) A member who violates the general regulations of this society shall be fined not more than 5,000 yen.

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- 29) A member who violates the control regulations of this society shall be fined not more than 10,000 yen.

SOURCE: Toseikai Nenkan (Control Society Year Book)
Tokyo, p. 271, February 10, 1943.

Appendix XVII

The Control Regulations of the Japan Bicycle Control Society (Abstract)

Chapter I General Rules.

- Article 1. The control of the bicycle business by the members of the Society is regulated according to the following regulations supplementing the order, established by the Society.
- Article 2. To control the production and distribution of the Society periodically, a year is divided into 4 periods. The first period: April to June. The second period: July to September. The third period: October to December. The fourth period: January to March.
- Article 3. In this regulation of the Society, "Manufacturer" means a manufacturer as a member of the Society; wholesale merchant means a wholesaler of the Society; the Affiliated Association means an affiliated association acting as the distribution adjustment control society of the city, province, urban prefecture, and prefecture.

Chapter II Production Control.

- Article 4. The manufacturer shall not manufacture bicycles or their accessories, nor shall he do remaking, without having permission from the Society.
- The manufacturer shall not manufacture the articles that are not registered in the Society Members' Directory.
- Article 5. By the approval of authorities concerned, the Society shall decide on the number of bicycles to be manufactured and the articles for repair use. The Society shall direct the manufacturer accordingly.
- Article 6. Those who desire to be engaged in bicycle-remaking business shall apply for the approval of the Society.

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The application shall cover the following points:

- a) Indication of the amount of material, and indication of the dealer from whom the material should be purchased.
- b) Indication of the amount of used materials, the process planned, and amount of material to be abandoned.
- c) Amounts and kinds of the materials which are to be apportioned to different workers for remaking.
- d) The authentication by the purchasing parties concerned is to be presented.

Article 7. The members of the Society shall register the following equipment:

- a) Machine and electric motors.
- b) Storehouses
- c) Stores

Article 8. The Society shall have the right of restricting the equipment listed under the previous items.

Article 9. The Society shall designate the dealer from whom the manufacturer is to purchase the materials.

Article 10. The Society shall prepare the steel and other materials for distribution before directing each member to manufacture bicycles.

Article 11. The Society shall take a special consideration concerning the following items in regard to the records of individual members. But the Society shall act accordingly when there is a special direction by the authorities concerned.

- a) Actual results of production capacity of an individual factory.
- b) Convenience of packing and transportation.
- c) Grade and quality of the manufactured goods.
- d) The result of the consignment of goods.

Article 12. Manufacturer shall not refuse the order for manufacturing after the order was given, without having a special reason.

Article 13. Manufacturer shall present the manufactured bicycles within the designated period.

Article 14. Manufacturer shall not make use of materials for any other purpose than the designated one.

Article 15. Manufacturer shall not ship the bicycles without having them examined by the Japan Bicycle Investigation Association.

Article 16. Manufacturer shall follow the regulations and notices of the Japan Bicycle Inspection Association.

Chapter III. Distribution and Control

Article 17. According to the direction of authorities concerned, every three months the Society shall notify the Affiliated Association and members of the Association the number of bicycles and accessories to distribute to the dealers of different cities, provinces, and prefectures.

Article 18. The Society shall have joint business with the Affiliated Associations, the members of the Association, and the dealers whom the authorities concerned have designated.

Article 19. The Affiliated Associations shall decide on the number of bicycles and articles

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for repair use and accessories to distribute to the retail dealers, after having been notified by the Society.

Article 20. The estimation and the distribution of the previous items shall be made according to the order of the authorities concerned.

Article 21. The Affiliated Associations shall not make use of goods for purposes other than those designated by the Society.

Article 22. The Society shall direct the Affiliated Associations, whenever there is any direction by the authorities concerned, to take special measures on the adjustments of bicycles.

Chapter IV. Punishment for violators.

Article 23. When the members of the Society violate the regulations of Article 4, 14, 15, 21, they shall be fined not more than 500 yen.

Article 24. When the members of the Society violate the regulations of Article 5, 6, 7, 16, 20, they shall be fined not more than one-thousand yen.

SOURCE: Kampo, July 13, 1944.

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Appendix XVIII

Essential Materials Supervision Corporation Law^{1/}
 (Juyo Busshi Kanri Eidan-po)
 February 24, 1942, Law No. 69

Name of Corporation: Juyo Busshi Kanri Eidan

Capitalization: Yen 20,000,000, supplied entirely by the Government

Purpose: "To guarantee and increase stocks of essential materials in wartime; to provide for efficient and adequate utilization of the stored essential materials."

The content of this Law in general is similar to the Industrial Equipment Corporation Law (Sangyo Setsubi Eidan-po). The concrete projects of the Corporation are listed below.

1. Storage of the essential materials to provide for their continuous supply to meet the demand in emergency cases, such as air raids. If the reserved materials are enormous and the Corporation's facilities are insufficient, it is provided that the Corporation can order others to store them. (Article 18).
2. Purchase, importation and sale of the essential materials. This involves procurement of the materials for stock piling, and disposal of the stocked materials. The Corporation can demand that those who store the essential materials report on their books and documents. (Article 17)/
3. The Corporation may engage in activities necessary to achieve its purpose, (for instance, establishment of new warehouses). However, since the activities of the Corporation are concerned with the movement of materials, those activities should be in accordance with the plans of the Government (Article 16).

The following are characteristic points of the law concerning the corporation's financial structure:

1. It lacks provisions for issue of debentures.
2. It lacks provisions for compensation of the Corporation's losses.
3. It includes penalties in case of negligence on the part of Corporation's Officials, which is different from some other Corporation's such as the Industrial Equipment Management Corporation.

^{1/} The name of this Law is alternatively translated as Vital Materials Management Corporation Law.

Date of enforcement of this law is decided as March 5, 1942 by the Imperial Ordinance No. 122, March 4, 1942.

Source: Keizai Tosei-ho Nempo (Economic Control Law Annual Report) Series I, Vol. I, (January-March 1942) p. 83 - 84