

II. JAPAN'S IRON AND STEEL POSITION, 1928-36A. Finished Steel1. Consumption

a. Over-all consumption. Consumption of finished steel in Japan during the period 1930-34¹ averaged annually about 2,350,000 tons² or 35.3 kilograms per capita (see Table 1). In comparison, the averages amounted to 2,370,000 tons in 1928-29 and 3,750,000 tons in 1935-36, or 37.3 and 53.7 kilograms per capita, respectively. As might be expected, the period 1930-34 was marked by a depression decline of approximately 25 percent in per capita consumption from the 1929 pre-depression high of 41.2 kilograms. By 1933, per capita consumption had risen to a magnitude nearly equal that of 1929 and exceeded it in 1934, when it reached 45.8 kilograms per capita or a total consumption of 3,130,000 tons. This rising trend continued with an increase in per capita consumption of nearly 15 percent in 1935 and with an average annual per capita consumption in 1935-36 amounting to 30 percent more than that in 1930-34.

1. Although it was not definitely determined, it appears that fiscal years were used in the sources from which the data in this report were drawn. The Japanese fiscal year is from April to March. Thus, the fiscal year designated 1928 ran from April 1, 1928 to March 31, 1929.

2. Metric tons are used throughout this report.

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b. Consumption by industry. Although complete data are not available, data at hand are sufficient to permit drawing some conclusions concerning the relative proportions of finished steel consumed by the major industries (see Table 2). Of total consumption of finished steel in 1930-34, the construction and the machinery industries each accounted for an average of about 30 percent; railroads, 11 percent; shipbuilding, 9 percent; oil, gas, and water works, 3 percent; and mining, 3 percent. Within this period, considerable shifts occurred in the relative importance of the consumption of steel by industries. Most striking were declines of 33 percent and 32 percent, respectively, in the relative (percentage) consumption by railroads and the construction industry, and increases of 50 percent and 70 percent, respectively, in relative consumption by the shipbuilding and machinery industries. The sharpest increase in relative consumption for both the shipbuilding and machinery industries occurred in 1933.

c. Consumption by major product. Two-thirds of all finished steel products consumed in Japan fell within two categories --rod and bar and sheet. Rod and bar accounted for 37 percent of consumption in the period 1930-31 and sheet accounted for 29 percent (see Table 3). Wire bar ranked third in importance (12 percent); rails and fishplate fourth (9 percent); and tin plate, pipe and tube, and the blanket category "others" accounted for about 4 percent each.

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During the period 1928-36, there were some shifts in the relative magnitudes though not sufficient to change the order of importance in consumption of the major products. Between the two periods 1928-30 and 1935-36, consumption of rod and bar declined from 39 to 35 percent; sheet increased from 27 to 31 percent; wire bar increased from 9 to 13 percent; and rail and fishplates declined from 11 to 5 percent. In terms of annual tonnage, rails and fishplates was the only category that was not consumed in increasing amounts throughout the period 1928-36; consumption of this item increased to a maximum of 278,000 tons in 1930 and thereafter declined to 213,000 tons in 1936. The general downward trend of consumption of rails and fishplates probably marks the end of the era of major railroad expansion in Japan.

d. Military consumption. No data are available with respect to military consumption of finished steel prior to 1937.¹ In that year, 18 percent of the total consumption of steel was accounted for by the armed forces. The proportion rose to 26 percent in the following year, to about 50 percent in 1941, and to a peak of 65

1. Data relating to military consumption of steel for the years 1937-44 were obtained in Japan by the United States Strategic Bombing Survey. These data include consumption by the military for all the implements of war and for construction and expansion of plants. Warships are included; merchant vessels excluded.

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percent in 1944. The average rate of direct military consumption in 1930-34 must have been much lower. This seems particularly probable in view of the relatively small total steel consumption in the earlier period, and of Japan's pressing need for increasing the size of its industrial base. Therefore, it seems reasonable to estimate the average rate of strictly military consumption of finished steel in the period 1930-34 at approximately .5 percent, or slightly less than 2 kilograms per capita.¹

2. Supply. Such information as is available on stocks and inventories during the period 1928-36 indicates them to be insignificant in size.² Total supply available annually, therefore, is considered equivalent to production plus net imports.

a. Production. Domestic production has been the most important Japanese source of supply of finished steel and became increasingly so during the period 1928-36 (see Table 1). Production reached a pre-depression peak of 2,030,000 tons in 1929, declined 20 percent

1. Since this percentage estimate was made, the September 1945 issue of the Oriental Economist has become available. In an article entitled "Iron and Steel in Peacetime", an estimate of 5.4 percent of the total consumption in 1934 is given as direct military consumption.

2. Factory Statistics, 1932. Includes data on stocks for the years 1929-32.

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in 1931, surpassed its previous high in 1932, and thereafter increased steadily reaching in 1936 a magnitude of 4,540,000 tons or more than double that of 1929. Average annual production was 2,360,000 tons in the period 1930-34, in comparison with the somewhat smaller output of 1928-30 and the substantially larger production of 4,260,000 tons on the average in 1935-36.

Output of the major finished steel products in order of magnitude of annual average production 1930-34 is as follows: bar, thick plate, shapes, thin plate, rails and fishplates, wire bars, tube and pipe, cast steel, forged steel, tin plate, and special steels (see Table 4). This relationship also obtained in the period 1928-30, but in 1935-36 the decline in demand for rails and fishplate resulted in a relatively lower output reversing the positions of this category and wire bars.

During the period 1928-36, production of all finished steel products increased. Output of bars, shapes, and heavy steel plate was doubled and that of steel pipe almost tripled. More striking were the five-fold increase in the production of thin steel plates, the sevenfold increase in wire bar, and the ninefold increase in tin plate. Rail production showed an increase of 75 percent at its peak in 1934, but declined thereafter. Outputs of forgings, castings, and special steel, (small in magnitude but of great industrial importance) were

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respectively, about two and one-half, two and one-half, and five times as great as the output in 1928.

b. Imports and exports. In the period 1928-30, imports of finished steel made an important contribution to total steel supplies in Japan. Deducting exports, averaging annually about 200,000 tons, net imports annually amounted to 475,000 tons. Even in this period, however, the trend was declining and the depression year of 1931 was the last year in which imports exceeded exports. From this time on, Japan reversed its trade position and its excess of average annual exports over average annual imports, though very slight (15,000 tons) in the period 1930-34, amounted to about 500,000 tons in 1935-36. Not only did the import-export balance reverse its position during the years 1928 to 1936, but the magnitude of imports also declined from 825,000 tons to 345,000 tons, whereas that of exports increased from 182,000 tons to 987,000 tons.

Japan traded in nearly all types and grades of finished steel in the period 1928-36. Although trade was largely confined to imports in such types of steel as wire bar and tin plate, trade in rails and fishplates and in sheet steel was largely export. The pattern of trade in sheet, rod and bar, and pipe and tube, changed during the period. In the earlier years, imports of these items greatly exceeded exports but, by 1936, this situation was reversed and exports exceeded imports.

B. Ingot Steel

1. Consumption. Consumption of ingot steel increased from an annual average of 2,270,000 tons or 35.7 kilograms per capita in 1928-30 to 2,780,000 tons or 42 kilograms per capita in the period 1930 to 1934 (see Table 5). Average annual tonnage consumed in the two years following nearly doubled that of 1930-34 and on a per capita basis exceeded 74 kilograms. Throughout the period consumption followed the cyclical trend, falling in 1931 to 20 percent below the pre-depression high of 1929 and thereafter increasing steadily at an average annual rate of nearly 25 percent. The relatively greater increase in the consumption of ingot steel compared to finished steel may be accounted for by the fact that domestic production of finished steel increased at a greater rate than did consumption.

2. Supply. As in the case of finished steel, available data indicate that Japanese stocks and inventories were insignificant. Therefore, supply is assumed to be equal to production plus net imports.

a. Production. As a source of supply for ingot steel Japan relied almost completely on domestic production. Trends in production, therefore, are adequately reflected in the above discussion of consumption. In the production of ingot steel, pig iron, and scrap iron were the major raw materials (see

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Table 6). Small quantities of iron ore were also used -- in terms of metal content less than 4 percent of the combined metal content of scrap, pig, and ore used. Scrap and pig iron were used in varying ratios over the period 1928-36. The trend toward greater proportionate use of scrap throughout this period, however, was striking. In 1928-30, the ratio of scrap to pig iron was almost exactly 50:50. By 1933, a shift had occurred and the ratio became 54:46. These proportions continued to change in favor of scrap, raising the average annual ratio of 1930-34 to 53:47 and that of 1935-36 to nearly 60:40.

b. Imports and exports. Imports of ingot were relatively unimportant, never exceeding 5 percent of net supply. Average annual imports in 1928-30 were 110,000 tons; in 1930-34, 62,000 tons; and in 1935-36, 221,000 tons (see Table 5). Exports were insignificant, being less than 1,000 tons until 1934, when they amounted to only 5,000 tons. Although they increased between two and three hundred percent in 1935-36, imports remained negligible.

c. Pig Iron.

1. Consumption. Although less in magnitude, consumption followed much the same pattern as that of ingot steel. From a peak of 1,880,000 tons in 1929, it declined to a low of 1,410,000 tons in 1931, thereafter rising to over 3,000,000 tons in 1936 (see Table 7). The average per capita consumption in the period 1930-34 was 28.5

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kilograms -- slightly more than the 1928-30 average --- but by 1935-36 it had increased almost 50 percent to 43.6 kilograms.

Of the two major uses for pig iron, the manufacture of ingot steel and the production of iron castings,¹ the former was the larger. Consumption of pig iron in the production of steel amounted to an annual average of slightly more than 60 percent of net supply in 1928-30 and slightly more than 70 percent of net supply in 1930-34 and 1935-36. Consumption in iron castings during the periods 1928-30 and 1935-36 exceeded the average annual consumption in 1930-34 of 530,000 tons by 150,000 and 300,000 tons, respectively.

2. Supply. As in the case of finished steel and ingot steel, available data indicate that stockpiling of pig iron was relatively insignificant in the period under consideration. Domestic production made the greatest contribution to net supply and averaged annually, 1,100,000 tons in 1928-30; 1,250,000 tons in 1930-34; and 1,960,000 tons in 1935-36.

Imports of pig iron were an important addition to supply, comprising 40 percent of total supply in the period 1928-30, 35 percent in 1930-34, and 35 percent in 1935-36. In terms of

1. Estimated roughly as the difference between apparent total consumption of pig iron and consumption of pig iron in the steel furnaces.

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tonnage, the average annual amounts imported in the above three periods were 670,000; 650,000; and 1,100,000 tons, respectively. Exports never exceeded 4,000 tons annually and were thus insignificant in the supply situation.

D. Scrap Iron

1. Consumption. Data relating to consumption of scrap iron are largely confined to its use in the output of ingot steel (see Table 6) and to small amounts consumed in producing pig iron and in "other uses." As was indicated in the discussion of ingot steel, scrap became an increasingly important material in its production. Total reported (see Table 8) consumption rose from an annual average of 1,100,000 tons in 1928-30 to 1,600,000 tons in 1930-34 and 3,200,000 tons in 1935-36. Largest increases in annual consumption occurred in 1933 and 1934; consumption in each of these years exceeded that in the preceding year by approximately 600,000 tons. Additional unreported but probably relatively small quantities of scrap were undoubtedly utilized directly in the production of iron castings.

2. Supply

a. Production. Data supplied by the Japanese Iron and Steel Control Association to the US Strategic Bombing Survey and to SCAP in Japan indicate that average annual domestic production of scrap in the period 1928-30 was 0.9 million tons; in 1930-34,

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totalled 1.3 million tons; and in 1935-36 reached nearly 1.9 million tons (see Table 8). This production can be further divided into two categories, domestically purchased and self-generated scrap. The former was reported to USSBS as amounting to 0.8 million tons annually in 1931 and 1932 and 1.1 million tons in each of the years 1933 to 1936. Self-generated scrap -- which was generated between the ingot steel and the finished steel stages -- annually averaged approximately 16 percent of ingot steel consumed in the production of finished steel.

b. Imports and exports. Imports of scrap iron increased in all years except 1931 and 1936. The annual average imports in 1928-30 were 450,000 tons; in 1930-34, 754,000 tons; and in 1935-36, nearly 1,600,000 tons. The largest increase occurred in 1933 when imports of slightly more than 1,000,000 tons represented nearly a 100 percent increase over the preceding year. Exports were at a maximum of 19,000 tons in 1928 and continued to be insignificant throughout the period.

c. Stockpiles. Prior to 1931, no reported data are available for stockpiling of ferrous scrap in Japan. For the years 1931 to 1945, however, data were collected in Japan by the United States Strategic Bombing Survey. These data indicate a stockpile of over 1 million tons of scrap iron on hand at the beginning of the year 1931. Relating consumption and net new supply of scrap in the years

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prior to 1931 to the 1931 stock figure, it is estimated that stocks on hand at the beginning of the year 1928 amounted to 410,000 tons. An excess of production and imports of scrap permitted sizeable annual additions to these stocks. These additions to stocks increased from nearly 0.15 million in 1928 to nearly 0.7 million tons in 1933. In 1934, additions to stock dropped to 0.5 million and, because of the tremendous increase in requirements for ingot production, to the still lower magnitudes of 0.35 and 0.1 million tons in 1935 and 1936, respectively. Stocks on hand at the end of the fiscal year 1936 amounted to nearly 3.5 million tons.

E. Iron Ore

1. Consumption. Japanese consumption of iron ore averaged annually 1,860,000 tons in 1928-30; 2,060,000 tons in 1930-34; and 3,630,000 tons in 1935-36 (see Table 9). On a per capita basis for the same periods, consumption was 28.7, 31.0, and 52.0 kilograms, respectively. The upward trend indicated represents an absolute increase of 100 percent (about 75 percent on a per capita basis) between 1928 and 1936, with the largest increase after the depression lows occurring in 1935, when consumption was over 700,000 tons greater than in the preceding year.

In the period 1928-36, approximately 90-93 percent of the iron ore was consumed by blast furnaces in the production of pig iron. The remaining 7-10 percent was employed largely in the production of steel,

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where it is used to help reduce the carbon content of pig iron. Some indication of the recoverable iron content of ores used in Japanese blast furnaces can be found in Table 10. In this table a calculation of the ratio of pig iron produced to ore consumed shows a 66 to 68 percent recovery 1928-34, with a decrease to about 58 percent in 1935 and 1936. Apparently, increased domestic production as well as the greatly increased volume of imports yielded ores of lower quality than those previously used.

2. Supply. Japan, during the period under consideration, was largely dependent upon imported ores. These contributed 92 percent to average annual net new supply or approximately 2,100,000 tons in 1928-29. The percentage contribution of imports in the periods 1930-34 and 1935-36 declined to 87 percent, with annual average tonnages amounting to 1,940,000 tons and 3,830,000 tons, respectively. The largest increase occurred in 1935, when imports exceeded those of the preceding year by more than 50 percent. Imports more than doubled between 1928 and 1936.

Domestic production, although contributing relatively little to the net new supply, increased from 158,000 tons in 1928 to 621,000 tons in 1936, a gain of nearly 300 percent. With the exception of the years 1931 and 1932, (the percentage of decline in these two years was lower than that of imports) production steadily increased over the period.

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Annual contributions to supply exceeded annual consumption in all years except 1933 and 1934. Japan was thus able to build up stockpiles of iron ore from slightly less than 1 million tons in 1928 to over 3 million tons in 1936. In terms of metal content, these stocks were roughly equivalent to two million tons of pig iron.

F. Balance of Payments for Ferrous Materials

Industrial Japan has always depended heavily upon imports of ferrous materials. In the period 1928-36, however, the character of these imports changed considerably and in a manner that profoundly affected Japan's balance of payments for these materials. A summarization of Table 11, showing the changing situation by presenting annual average cost of net imports of ferrous materials in both current prices and 1930 prices for three periods, 1928-30, 1930-34, and 1935-36, is given below:

(In million yen)

| Annual Average | Finished Steel | Ingot Steel | Pig Iron | Scrap Iron | Iron Ore | Total Net Imports |
|---------------------|----------------|-------------|----------|------------|----------|-------------------|
| (in current prices) | | | | | | |
| 1928-30 | 54.00 | 8.07 | 28.67 | 15.40 | 19.66 | 125.80 |
| 1930-34 | - 3.60 | 4.10 | 23.00 | 28.30 | 16.53 | 68.33 |
| 1935-36 | -81.50 | 15.45 | 43.30 | 81.50 | 38.35 | 102.10 |
| (in 1930 prices) | | | | | | |
| 1928-30 | 51.67 | 7.00 | 26.00 | 15.08 | 19.05 | 118.80 |
| 1930-34 | -12.40 | 3.94 | 24.70 | 26.10 | 17.37 | 59.77 |
| 1935-36 | -92.50 | 13.20 | 44.25 | 55.62 | 34.43 | 55.00 |

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Two important facts can be derived from this summarization that are not apparent from a consideration of changes in physical quantities of the ferrous materials entering into the external trade of Japan. These are (1), the importance and the changing role of finished steel and (2), the changing terms of trade. They are discussed in the above order in the following paragraphs.

In terms of current prices, finished steel accounted for about 45 percent of the cost of total net imports in the period 1928-30. With its growing industrialization, however, Japan was able to become a net exporter of finished steel in 1932 and, in the period 1930-34, finished steel, rather than drawing substantially on foreign exchange, contributed over three and one-half million yen toward payment for imports of other ferrous materials. By 1935-36, net exports of finished steel (which did not rise in price) had increased so greatly that, in spite of an approximate rise above 1930 levels of 30 percent in the average unit price of ferrous imports, exports of finished steel were sufficient to pay for three times their tonnages in net imports of scrap, or for nearly one-half of the cost of net imports of iron ore, scrap, pig, and ingot steel combined.

The summary of the net import situation in terms of 1930 prices eliminates the effect of annual price changes. Comparing data expressed in these terms with those expressed in current prices, it is

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apparent that the terms of trade shifted against Japan within the period 1930-34. In terms of current prices, the value of net exports of finished steel was less in this period than in terms of 1930 prices. Both the import and export prices dropped in 1931. The former, however, fell relatively less and, although they had increased by 1934 to 30 percent above the 1930 level, the latter had recovered just to that level. A similar comparison of combined average annual net import costs of ferrous materials other than finished steel in this period shows little change in the terms of trade. This is largely because exports of these materials were insignificant, and because depressed prices in 1931 and 1932 tended to off-set rises in prices above 1930 levels in 1933 and 1934. Only imports of iron ore failed to rise in unit price in these last two years.

A comparison of average annual net import costs, in terms of current and of 1930 prices during the period 1935-36 shows even more strikingly the shift against Japan in the terms of trade. Net import costs of each of the ferrous materials was greater in current than in 1930 prices. Total net imports of 100 million yen at current prices, would have cost Japan only 55 million yen at 1930 prices. In short, a ton of finished steel exported would pay for only one-half the ferrous imports in 1935-36 that it would have paid for in 1930.

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III. JAPANESE IRON AND STEEL REQUIREMENTS, 1950A. Japanese Finished Steel and Cast Iron Requirements, 1950 (A provisional estimate)

1. Finished Steel Requirements. On the assumption that Allied policy with respect to the general standard of living to be permitted in Japan will be substantially equivalent to the standard which obtained during 1930-34, a preliminary projection of finished steel requirements to 1950 may be made on the basis of average annual per capita civilian consumption in the period 1930-34. An average population of 66.3 million people consumed finished steel at an annual average rate of 35.4 kilograms per capita in this period. Direct military consumption during the same years is estimated to have constituted approximately 5 percent of total consumption, leaving for civilian consumption 33.6 kilograms per capita.¹ Applying this

1. It may be argued that, since the period 1930-34 includes some aggression years, civilian requirements projected on the basis of consumption in this period should be reduced to the extent that steel in these years was employed in indirect as well as direct military uses. There has been no attempt to make such an allowance in this paper because the data available are inadequate to permit a quantitative differentiation between the steel that went into the normal growth of Japan's industrial economy and that which can be considered to have gone into the more rapid development of an economy gearing for war. In this connection it may be noted that the period 1930-34, which has been selected as a basis for projecting requirements, includes three years (1930, 1931, and 1932) during which consumption of finished steel was substantially below that of the two preceding years, 1928 and 1929. By 1933 and 1934 total consumption of finished steel was above that of 1929; per capita consumption in 1933 remained below but in 1934 exceeded the 1929 level. Thus, on the average, both total consumption and per capita annual consumption were lower in 1930-34 than in 1928-29.

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figure to an estimated population of 79 million ¹ in 1950, Japan's finished steel requirements may be projected to that date as 2.7 million tons annually. It is estimated that approximately 100,000 to 150,000 tons of this amount will be cast, forged, and special steels; the balance, rolled steel.

In order to produce 2.7 million tons of finished steel annually, it is estimated that Japan will require 3.6 million tons of ingot steel. This estimate assumes that, in the production of finished steel, about 25 percent of the ingot steel used will become "self-generated" scrap. ²

Finished steel supplies sufficient to meet requirements of this magnitude would permit the same per capita rate of industrial growth and, without further restrictions, the same levels and patterns of per capita civilian consumption and the same rate of exports of domestically produced finished goods made of steel that obtained on the average in the period 1939-34.

2. Cast Iron Requirements. An industrial economy utilizes pig iron for iron castings as well as for ingot steel. Data available as a basis for projecting Japanese requirements for cast iron are not completely satisfactory. An estimate of consumption of pig iron for

1. Preliminary estimate by the Japan Branch, DRF.
2. See discussion of scrap iron and steel supplies, Section III, B.

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this purpose in 1930-34, however, can be made by assuming that the excess of pig iron produced over pig iron consumed in the production of ingot steel was used in iron castings. ¹ On this basis the average annual consumption in 1930-34 was 530,000 tons. Allowing for population increases, and deducting 5 percent for estimated direct military consumption, requirements of approximately 600,000 tons in 1950 may be projected from these data.

It is emphasized that the requirements projected in this paper are provisional. A final projection necessarily must consider finished steel and cast iron requirements in view of Allied policy decisions with respect to the Japanese economy as a whole. These decisions concerning the levels and patterns of domestic consumption, domestic production, imports, and exports of iron and steel products may materially affect requirements. Technological changes also must be surveyed more carefully in a final projection of requirements, since they may necessitate a greater or lesser need for steel or a greater need for higher-grade steels in the future.

B. Alternative Methods of Supplying Japan's Finished Steel and Cast Iron Requirements, 1950

1. General Assumptions. In discussing three of the possible patterns of supply, three general assumptions have been made:

(a) That reparations removals will leave Japan adequate ingot steel capacity and adequate finished steel capacity to meet the

1. Foundries producing iron castings also consumed an undetermined amount of scrap iron. It is assumed in this report that the scrap iron consumed for this purpose was not included in Japanese estimates of available domestic scrap supplies.

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domestic requirements projected in the preceding section. This assumption seems realistic for the following reasons: (1) the large existing excess capacity over peacetime needs; (2) the necessity of holding import costs to a minimum; and (3) the fact that limitation of imports of more basic ferrous materials, such as scrap, pig, or iron ore, would seem to be an effective check on Japan's capacity for future aggression.

(b) That Japan's electric furnace capacity will be reduced to 100,000 metric tons. This will reduce its ability to utilize scrap iron. In FEC-059/14 dated June 14, 1946, the Far Eastern Commission has decided on this level of electric furnace capacity in recommending interim reparations removals.

(c) That Japan will be expected to supply its scrap iron and iron ore requirements domestically, insofar as this is possible without incurring grossly uneconomical operations. This would minimize the possibility of stockpiling either of these materials and would reduce import costs.

2. Estimate of Japan's Annual Domestic Supplies of Ferrous Materials in 1950

a. Iron ore. Domestic production of iron-bearing materials increased from an annual average of less than 0.3 million tons in 1930-34 to a peak production of 4.4 million tons with an average iron content of about 43 percent in 1944.¹ Undoubtedly the phenomenal

1. Data from which the 1944 figures were derived were gathered in Japan by the US Strategic Bombing Survey. Averages for 1930-34 are taken from Table 9, appended to this report.

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increase in production in the later years was, to a considerable extent, a result of subsidy payments which encouraged the operation of uneconomical mines.

The best available estimate of the peacetime potentialities of Japanese iron mines appears to be that made by SCAP engineers. According to these technicians, under an unsubsidized system and by restricting mining to ores of commercial or near-commercial grades, the maximum output which can be expected will be 2 million tons annually. Iron content in this output is estimated at 42.5 percent, or 0.85 million tons. This rate of production is approximately the same as the rate of production which obtained in 1942.

b. Scrap iron and steel. There are two principal sources of scrap iron and steel. The first, "self-generated," is defined as the difference between the tonnage of finished steel produced and the consumption of ingot steel in that process. It consists largely of sheared ends, trimmings, and rejections. The higher the grade of finished steel produced, the greater will be the proportion of self-generated scrap. In the early 1930's, when Japan produced chiefly poor and medium grades of steel, only about 16 percent of ingot steel became self-generated scrap. This ratio increased until it reached nearly 30 percent at the height of the war effort. It is assumed herein that Japan will be allowed to produce a larger proportion of high-grade steel in the future than in the early 1930's but not as large as proportion as was produced in the late war years. In the future,

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Japan may expect to have available annually as self-generated scrap about 25 percent of its ingot steel production. Since ingot steel requirements are projected in this report at 3.6 million tons, annual supplies of self-generated scrap may be estimated at 0.9 million tons each year.

The second source of scrap iron and steel may be called "domestically purchased" scrap and includes obsolete and worn-out iron and steel equipment and "new scrap" generated in the future fabrication of finished steel. Data with respect to domestically purchased scrap were supplied by the Japan Iron and Steel Control Association to the United States Strategic Bombing Survey in Japan. According to this source, domestically purchased scrap averaged annually about 0.8 million tons during 1931-32, about 1.1 million tons during 1933-38, and about 0.9 million tons in 1939 and in 1940. Thereafter purchases were reported to have increased from 1 million tons in 1941 to 1.3 million tons in 1944.

Additional data on domestic scrap supplies furnished by the Japan Iron and Steel Control Association have recently become available in a preliminary report of the Natural Resources Section of SCAP.¹ Since this report does not separate self-generated and domestically purchased scrap, the amount domestically purchased has been estimated

1. General Headquarters, Supreme Commander for the Allied Powers, Report Number 44, Mineral Resources of Japan Proper, July 5, 1946, p. 83.

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