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shipped abroad. Japan aspires to become the center of supply of medicines to the Asiatic countries.

Of industrial chemicals, acids and soda occupy the key positions. Prewar Japan produced about 2,000,000 metric tons (caculated to 100% H2 SO4) of sulphuric acid and, next to the U.S., stood shoulder to shoulder with Germany, standing among the countries that supplied the major portion of that chemical product. This was due to the development of the fertilizer industry in Japan, and the majority of sulphuric acid produced in Japan, about Baume 50, was manufactured in the factories attached to fertilizer companies and was intended as fertilizer.

Immediately before the War, some manufactories of sulphuric acid by the catalytic system had been established, and, during the War, there was a time when the production of sulphuric acid reached more than 3,000,000 metric tons. As it is believed these catalytic system plants will be closed by the Allied Forces eventually, Japan presumably will have left the productive capacity for only about 2,000,000 metric tons, after reparations objectives are cleared away, even though the war ravaged and antiquated plants are repaired and mobilized. If such be the case, the total will be found somewhat short of filling the domestic need, but there will be no way out but to cover the shortage by more efficiency. The raw material, Pyrite, is markedly in short supply at present and its production must be increased. There is a sufficient deposit of Pyrite in Japan.

The prewar production of hydrochloric acid in Japan amounted to about 140,000 metric tons a year, out of which about 80 per cent was consumed by the food seasoning industry. The acid is synthetically made of chlorine, a by-product of the soda industry by electrolysis, and the electrolysis factories are expected to have the output reduced by the Occupation Forces.

Nitric acid is manufactured from ammonia by nitrogen fixation, and since it forms a material for munitions, its output is expected to be curtailed in the future.

The soda industry will face much difficulty since Japan has no salt. (Japan's sea salt is not enough to meet the demand for edible purpose at home); but, after the War, the industry is operating to some extent with salt supplied by China. Caustic soda is indispensable in the manufacture of rayon, staple fiber, soap, paper, etc., and the condition of its supply in the future will much influence the development of the above industries. Soda ash has close relations to the manufacture of glass, enamelled ironware, etc.

Of the soda industry, the electrolysis system produces chlorine as a by-product, but since it can be used as material for poison gas, the electrolysis factories are expected to be reduced to a considerable extent. In prewar Japan the production of soda (figuring the total output converted into carbonic acid soda) reached about 350,000 to 400,000 metric tons a year. How the industry will carry on hereafter depends on the extent of the factories to be evacuated as reparations objectives and the amount of salt to be imported. Conditions permitting, the soda industry of Japan may be developed into one of the export industries.

Dyestuff: Japan's dyestuff output before the War reached about 30,000 metric tons a year, with about 6,000 to 7,000 metric tons available for export. After the War the output at one time shrank to about 700 metric tons but recovered up to 2,700 metric tons in 1947. Japan requires much dyestuff in processing the textile manufactures for exports, but owing to a great reduction in the output of benzol, etc., the production of dyestuff could not be greatly developed. The reduced output of benzol is due to insufficient production as a by-product because of the dwindled output of coke at the iron works. The dyestuff industry is one which Japan desires to develop further, but since these factories can easily be

Production, Imports and Exports of Synthetic Dyes
(in metric tons)

	Production	Imports	Exports	Balance
1926	9,506	3,280	475	12,311
1930	9,813	2,698	2,086	10,425
1935	19,370	1,256	8,883	11,743
1937	19,115	2,315	6,032	15,398
1940	28,806	138	6,804	22,138
1941	24,838	92	4,864	20,066
1942	8,844	118	1,071	7,891
1943	7,837	648	2,491	5,994
1944	3,117	226	858	485
1945	684	114	118	84

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converted into war munitions plants, it remains a problem as to what extent the industry may be permitted to operate.

Paints: Before the War, Japan annually produced about 9,000 metric tons of paints, but today, the capacity has been reduced to about 20,000 metric tons a year, with the quality much lowered. The principal reason for this is found in the lack of drying oil as well as of natural resin, solvent, etc. We must depend on importation of these material hereafter.

Pigments: One factor for the shortage and low quality of varnish is traced to the shortage of material for pigments. Of the major needs, the material for white color may be obtained from zinc since postwar Japan has some surplus, but there is none of good quality for making carbon black for black color. Japan used to import about 5,000 metric tons a year from America before the War, and this is necessary hereafter. Many of the other materials are obtained from minerals, and much will have to be brought from abroad.

Oil and Fat: The annual output of vegetable oil in prewar Japan amounted to about 200,000 metric tons, out of which about 80,000 metric tons were exported. Since a great portion of material for the oil had depended on importation, postwar Japan is suffering from a severe lack of oil. Of the oil material that prewar Japan required, estimating about one-third of imported soy beans as having been turned over for oil manufacturing, it totals about 700,000 metric tons. Out of this total, 200,000 metric tons were domestic and 500,000 metric tons imported. The present shortage of oil and fat is causing trouble in foodstuff processing and other enterprises and a large quantity of material for oil manufacturing must be imported in the future. After the War, through the good offices of the Occupation Forces, some copra and other materials are being imported from the South, but to operate Japan's national economy at full force, the importation of, at least, 200,000 metric tons of oil materials may be necessary.

In prewar Japan, there was an annual supply of fish oil amounting to about 90,000 metric tons, but this has been greatly reduced in recent years. One reason is found in the remarkably poor haul of sardines. However, the production of fish oil in general has become significantly small of late.

One visible instance of the shortage of oil and fat is seen in the extreme lack of soap; the prewar annual output of about 250,000 metric tons, was reduced to 55,000 metric tons in 1947.

Prewar Production and Imports of Oil Seeds
(in 1,000 metric tons)

	Production		Imports	
	1936	1937	1936	1937
Perilla ocimoides ...	—	—	113.4	61.2
Cotton seed ...	0.3	0.3	90.0	119.1
Sesame seed ..	3.7	3.7	24.3	20.9
Rape seed	121.1	132.3	17.9	5.4
Linseed	3.8	3.4	12.8	8.0
Hemp seed ...	—	—	7.5	4.9
Other seeds ...	22.9	23.1	52.7	68.1
Copra	—	—	23.7	26.2
Totals	151.8	162.8	342.3	313.8
Soya bean	300.3	324.1	697.6	673.8
Peanut	13.7	11.4	11.7	9.2

Calculated sesame at 190 kin per koku, rapeseed at 200 kin per koku, soya bean at 215 kin per koku.

Production of Oils and Fats by Kinds
(in thousands of metric tons)

	1937	1940	1942
Bean oil	51.3	27.5	42.8
Rape-seed oil ...	34.7	25.8	29.2
Perilla oil	24.1	1.8	3.4
Linseed oil	4.1	3.5	7.2
Cottonseed oil ..	23.6	4.4	1.3
Sesame oil	7.1	9.0	6.3
Coconut oil	14.8	9.3	19.3
Peanut oil	1.5	3.3	6.0
Total of vegetable oils including others	210.0	22.0	169.1
Sardine oil	75.6	18.4	49.5
Total of fish oils including others	86.7	31.7	59.3
Whale oil	4.9	5.5	2.7
Beef tallow	4.0	3.3	2.5
Lard	1.0	0.8	0.4
Total of animal fats including others	7.0	5.8	3.1

Paper Manufacturing: The annual paper manufacturing capacity in prewar Japan amounted to about 1,700 million lbs. (European paper), 700 million lbs. (board paper) and 370 million lbs. (Japanese paper). These figures amount to about 1/10 of the total output in America, about

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one-third of that of Canada and Germany, and one-half that of England. Japan thus occupied 5th place in the world as a paper producing country, and she used to export about 10 per cent of her production. In the paper production (European kind) of prewar Japan, South Saghalien took up only about 20 per cent, but viewed from the point of the pulp supply, it furnished about 40 per cent, and judging by the pulp material consumed, the South Saghalien pulp occupied about one-half of the total.

It is natural, consequently, that postwar Japan minus South Saghalien should see the paper production markedly reduced. The paper output of postwar Japan measures up to about 20 per cent of that of the prewar total, producing, in 1947 about 410 million lbs. (European kind), about 150 million lbs. (board paper) and about 100 million lbs., (Japanese paper). Japan produced annually about one million metric tons of pulp for paper before the War, but came down to 200,000 metric tons in 1947. This is due to the loss of South Saghalien, but, more than that, the coal shortage is affecting the paper factories where they are unable to dispose of the quota of pulps assigned to them. Because of this, even the paper for school text-books is found short, and newsprint is subjected to wholesale restrictions. This makes the exportation of European paper out of the question for the time being. However, it is believed that Japan may be able to attain self-sufficiency in the paper supply without seeking materials from outside. In that case, the pulp that prewar Japan had self-supplied for the rayon industry will have to be imported.

The Japanese paper makers are suffering from the lack of materials such as mitsumata (tree), paper mulberry, etc., and whereas it had an annual production of 70 million lbs. (the hand manufactured Japanese paper) before the War, it has been reduced to 10 million lbs. after the War. Japanese paper, being extra fine, thin yet highly durable in quality had a considerable market abroad before the War. Orders for it have already been received from abroad following the War, but on account of small total output, all of these orders cannot be filled.

Glass: Prewar Japan had a production record of 4,452,000 cases a year (one case contains one hundred square feet

Production and Exports of Sheet Glass and Glass Ware

	Sheet glass (1,000 boxes)		Production of glass ware (1,000 metric tons)
	Production	Exports	
1926	1,780	370	..
1930	2,250	365	..
1935	3,130	217	..
1937	4,452	551	434
1938	3,662	411	400
1939	3,280	534	370
1940	3,748	583	350
1941	3,474	590	300
1942	2,528	305	271
1943	2,359	180	130
1944	1,335	70	55
1945	303	3	..
1946	755	..	..

1 box equals 1,000 sq. ft.

Production, Imports and Exports of Paper
(in 1,000,000 pounds)

	Production	Imports	Exports	Balance
1926 ..	1,200	66	—	1,266
1930 ..	1,682	98	225	1,555
1935 ..	2,264	167	193	2,248
1937 ..	3,354	142	271	2,225
1938 ..	2,983	19	331	2,671
1939 ..	3,392	4	423	2,964
1940 ..	3,406	4	314	3,096
1941 ..	3,338	1	244	3,095
1942 ..	2,680	0	165	2,515
1943 ..	2,002	—	45	1,957
1944 ..	1,232	—	11	1,221
1945 ..	480	—	—	480

Includes former territories.

Production, Exports and Sale of Portland Cement
(in 1,000 metric tons)

	Production	Exports	Marked at home	Stocks
1926 ..	3,206	239	2,904	131
1930 ..	3,748	489	3,119	162
1935 ..	4,527	592	3,866	210
1937 ..	4,933	482	4,444	220
1938 ..	4,397	387	3,975	255
1939 ..	2,510	245	2,285	234
1940 ..	6,052	973	4,934	380
1941 ..	5,838	692	4,900	625
1942 ..	4,356	168	4,039	773
1943 ..	3,778	126	3,606	818
1944 ..	2,965	32	3,150	601
1945 ..	1,173	..	..	..
1946 ..	922	..	..	..

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Production of Paper in Japan
(in 1,000,000 pounds)

	Paper	Board	Japanese paper (Machine-made)	Japanese paper (hand-made)	Total	Former territories: Paper	Former territories: Board
1926	1,054	256	270	50	1,630	65	..
1930	1,306	373	262	60	2,001	337	..
1935	1,646	515	279	70	2,510	399	..
1937	1,740	762	300	70	2,872	461	22
1938	1,625	540	293	70	2,568	434	20
1939	1,655	817	358	70	2,900	469	23
1940	1,538	855	400	72	2,865	518	24
1941	1,562	813	391	47	2,813	501	22
1942	1,268	543	356	33	2,200	458	21
1943	956	381	252	26	1,615	368	21
1944	596	132	124	12	854	304	64
1945	303	80	..	..	..	—	—
1946	354	..	..	..	..	—	—

of window pane) (1937). The figure is certainly a high watermark that can favorably be compared with America, and Japan continued for some years to produce 3 million cases a year. With the increasing intensity of War, the production suddenly decreased, coming down as low as 750,000 cases in 1946—although it slightly recovered in 1947 with about 1,200,000 cases.

Damage and losses caused by War are demanding almost limitless supply of plate and sheet glass, but the shortage of soda ash and coal is retarding a steady outflow of the glass. Before the War, Japan exported from 10 to 15 per cent of the total output of her plate glass, but, for some time to come, Japan will not have such surplus to spare.

Japan's total production of glassware, bottles, etc. before the War, was estimated at about ¥100 million, with about 30 per cent of it exported. In this line, also, postwar Japan is unable to fulfill her domestic demands on account of the shortage of raw materials and fuels.

Cement: Japan's total annual production of cement before the War amounted to about 5 million metric tons. It enjoyed a creditable reputation for its quality, and 10 per cent of the production was sold abroad. Japan has almost limitless amount of limestone, and provided coal is supplied in full, the cement industry will resume real activity. But as the domestic demand for cement will be enormous in its rehabilitation work, its exportation may not be hoped for some time.

Rubber Manufacture: Prewar Japan consumed annually from 50,000 to 60,000 metric tons of raw rubber, and exported about one-fourth of the total as manufactured goods. Geographically, Japan is near to the countries in South Asia where rubber is produced, and as the processing of rubber goods is possible at small scale factories, the rubber industry may be regarded as well suited for the future of Japan.

Japan, before the War, had exported rubber boots, rubber shoes, toys and tires for automobiles in considerably large quantities, and the rubber industry is one that deserves utmost efforts for development. At present, however, the war damaged rubber plantations in the South have not yet fully recovered, while Japan, on the other hand, is not in a position to import all that she requires.

By kind consideration of GHQ, after the War, some rubber is being brought in from the South. In order to manufacture one metric ton of rubber articles, it is necessary to have 7 metric tons of coal, it is said, and as Japan is feeling an acute shortage of coal at present the full recovery of the rubber industry cannot be expected for some time to come.

Synthetic Resin: In prewar Japan, synthetic resin was practically synonymous with phenol resin with 3,000 to 4,000 metric tons being produced. During the War, much Ureaform aldehyde resin, Accrilate resin, Vinyl resin etc., was produced for the use in plane construction, with total production amounting, at one time, to more than 400,000 metric tons.

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After the War, these materials have appeared on the general markets in the form of different household utensils, and it is believed that Japan might export these articles in the future.

Among synthetic resins, some materials cannot be obtained in sufficient quantity in Japan, but for Japan with none too abundant natural resources, the industry of producing such synthetic materials is highly desirable. Should it be possible to develop the industry like the celluloid industry, it will materially contribute toward Japan's national economy.

Production of Synthetic Resin
(in metric tons)

	Phenol resin	Others
1935	1,544	—
1936	3,042	3,000
1937	4,036	3,000
1938	4,099	84,000
1939	4,560	314,000
1940	5,100	239,000
1941	6,100	377,000

Aromatic: Japan's aromatic industry is favorably situated in regard to material supply. Japan, in this respect, may be considered as a rare, exceptional instance. The aromatic industry here is based on camphor oil. It was started more than 20 years ago when, out of necessity of natural camphor competing with artificial camphor, the manufacturers made intensive efforts to make the best use of its by-product, camphor oil, in order to minimize the cost of production. With the experience of 20 years, Japan today is able to produce almost any kind of essence with camphor oil as its base such as aromatics for perfume, toiletries and edibles (vanila and others).

There are about 50 kinds of aromatic materials in the world with an estimated prewar annual production at about 5,000 metric tons. The largest share of this total is taken up by 3,500 metric tons of camphor oil, followed by 2,500 metric tons of citronella oil and then by 900 metric tons of peppermint oil. Out of this, Japan supplies about one-half of camphor oil and about 40 per cent of the peppermint oil. Hence, Japan's production alone occupies about 40 per cent of the world's total output. At present, all of what Japan is capable of supplying is not being utilized, but should it become possible to make effective use of all of the raw materials, Japan may advance to the undisputed leader-position in this industry.

Japan's prewar aromatic production was 2,000 metric tons of essence oil a year.

XII. Mining and Metal Industries

Japan produces practically every variety of minerals, but, excepting coal, their output is very small. Hence, it has been remarked that Japan is a sample room of mineral objects, and the remark seems well justified.

Coal: The output of coal before the War amounted annually to about 45,000,000 metric tons and the record output, in 1940, of 57,300,000 metric tons was attained by intensive wartime digging. With the end of the War, the output abruptly decreased, dropping to as low as to 20,000,000 metric tons in 1946.

But, since the shortage of coal would seriously affect all industries and thus hamper recovery of Japan's economy, the government initiated the so-called sliding scale production policy or to nationalize part of the mines and other measures for the purpose of increasing the coal output. As a result, the output increased to 29,600,000 metric tons in 1947. Efforts are being made to raise the figure for 1948 to 36,000,000 metric tons or an increase by 20 per cent.

The factors for the sudden decrease of coal output after the War are found in (1) the return home of Koreans and Chinese who had been put to coal mining during the War and failure to collect the necessary labor to replace them, and (2) later, food condition, housing problem, lack of materials and shortage of skilled miners. Whereas one miner produced, in 1935, 215 metric tons, it shrank, in 1945, to 64 metric tons. Although the level has more or less recover-

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Japan's Mineral Production

Metal Content			1936 Prewar period	1941 During wartime	1944 During wartime	1946 After war end
Gold ore	(kg)	.....	22,188	25,500	11,100	1,277
Silver ore	„	.....	303,743	360,000	229,000	34,993
Copper ore	ton	.....	77,973	94,900	99,196	16,796
Lead	„	.....	8,883	25,717	34,929	7,846
Zinc	„	.....	39,066	52,972	75,870	17,535
Tin ore	„	.....	762	1,924	380	55
Iron ore	(1,000 metric ton)	.....	3,154.1	1,267.0	3,388.0	533.1
Pyrite	(metric ton)	.....	1,750,914	..	..	605,000
Antimony	„	.....	460	..	398	32
Mercury	„	.....	14.7	—	—	64
Sulphur	„	.....	198,237	201,333	71,525	27,500
Manganese	„	.....	67,753	195,546	400,679	349,000
Chromium	„	.....	38,476	61,560	81,481	..
Tungsten	„	.....	92	957	600	57
Molybdenum	„	.....	—	49	398	108
Asbestos	„	.....	—	—	—	2,300
Fluorite	„	.....	—	—	—	450
Graphite	„	.....	1,576	—	—	9,000
Phosphate rock	„	.....	113,101	—	—	—

ed, yet the maximum was, in 1947, only 102 metric tons. This is undoubtedly due to the promiscuous wartime digging that rendered all equipment and facilities in a deplorable condition, but it certainly was due, also, to the poor efficiency of miners. The raising of efficiency is difficult under the prevailing inflation, but the general condition is recovering, however slowly.

Japan is a country where self-sufficiency in coal could be realized. The underground deposit is said to amount to about 16,000 million metric tons, and, should transportation be efficiently geared to the output, there is no reason why Japan should feel any shortage of coal for her domestic needs. Before the War, Japan had shipped annually about 2,000,000 metric tons to Korea and South China while about 2,000,000 metric tons of coking coal were imported from North China and French Indo-China.

In addition, Japan imported several million metric tons of coal from Manchuria. This importation, however, was a political gesture demonstrating Japan's goodwill toward Manchuria. The importation continued during the War to supply war industries' needs. Japan had no basic reason necessitating importations of this sort. Even after the War, Japan's coal is being exported to Korea and South China, however small in amount while coking coal is being imported from North China.

The development of coal mining is the key to the recovery of Japan's economy and the Japanese are devoting their sole energy to its resuscitation.

Iron Mining: Japan mined iron, even before the War, but enough only to supply about one-fourth of her required amount and will need to import iron ore hereafter. After the War, by consideration of GHQ, some are being brought in from Kainan Island. The iron mines in Kainan Island were discovered by Japanese during the War and the necessary equipment and installations for digging were put up by the Japanese.

Copper: The copper requirement in prewar Japan was about 130,000 metric tons a year, about one-half of which was supplied at home and the remaining half imported mainly from U.S. Japan has an old history in production of copper, but the copper mines here are generally old and it is considered impossible to realize more than what had been produced before the War. Since it is believed strictly necessary to obtain the amount of copper that had been used before the War, in order to develop the electricity enterprise which constitutes the motive power for all industries, Japan will have to depend on imported copper hereafter.

Lead: Prewar Japan required about 100,000 metric tons of lead of year, with her domestic production less than 10,000 metric tons. As the amount of lead

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required before the War included a considerable portion for war munitions purposes, the peacetime requirement is believed to be about 4-50,000 metric tons. Even so, much of it will have to be imported.

Production, Imports and Exports of Copper
(in 1,000 metric tons)

	Production	Imports	Exports	Balance
1926 ..	67.4	16.5	2.5	81.4
1930 ..	79.0	2.5	33.2	48.3
1935 ..	70.9	69.6	17.8	122.7
1937 ..	86.7	95.7	3.2	179.2
1938 ..	95.2	104.7	6.8	193.1
1939 ..	96.1	117.2	8.6	204.7
1940 ..	99.8	145.4	7.7	237.5
1941 ..	94.9	51.2	—	146.1
1942 ..	91.2	0.7	—	91.9
1943 ..	112.8	0.5	—	113.3
1944 ..	90.2	4.1	—	94.3
1945 ..	23.3	—	—	23.3

Production, Imports and Exports of Lead
(in 1,000 metric tons)

	Production	Imports	Exports	Balance
1926 ..	3.6	55.1	—	58.7
1930 ..	3.6	56.2	0.6	59.1
1935 ..	7.4	91.4	1.9	96.0
1937 ..	10.4	98.7	2.0	107.1
1938 ..	11.1	60.8	1.9	70.0
1939 ..	11.8	101.0	1.4	111.4
1940 ..	22.8	92.1	—	114.9
1941 ..	25.7	78.5	—	104.2
1942 ..	24.8	0.7	—	25.5
1943 ..	29.8	3.2	—	33.0
1944 ..	34.1	2.6	—	36.7
1945 ..	9.5	—	—	9.5

Zinc: The prewar requirement for zinc amounted to about 100,000 metric tons. There was about 40,000 metric tons of refined zinc produced at home, but of this about one-half was produced from imported ores—which means that about 80 per cent of the needed zinc was dependent upon imported material. By wartime efforts, a number of zinc mines were discovered in Japan and it is believed that Japan might be able to carry on after this without importing from abroad. As the peacetime requirement, exclusive of war munitions, is considered to be about 3-40,000 metric tons, it is even thought possible that Japan might have zinc enough not only to satisfy her domestic needs but also for exportation. For this reason, ways are being studied to utilize zinc for cast metal, die cast, etc. Whereas Japan finds most of her metal materials insufficient with her home production, zinc alone is showing more or less of a surplus which is a very rare exception.

Production and Imports of Zinc
(in 1,000 metric tons)

	Production	Imports	Total
1926	17.0	40.4	57.4
1930	24.7	27.4	52.1
1935	34.2	45.8	80.0
1937	49.2	61.8	111.0
1938	56.1	46.7	102.8
1939	57.4	60.8	118.2
1940	61.1	24.3	85.4
1941	64.0	6.3	70.3
1942	59.8	3.4	63.2
1943	61.9	3.4	65.3
1944	60.0	0.7	60.7
1945	16.6	—	16.6

Tin: Prewar Japan needed annually about 5-6,000 metric tons of tin, out of which about 2,000 metric tons was self-supplied. During the War, as Japan occupied a great tin producing area in South Asia, there was a time, for political reasons, when she imported more than 10,000 metric tons a year and used it in even coining her currency. Her peacetime requirements will be about 4,000 metric tons.

The principal tin mines in Japan, on account of their relations with foreign capital, will have to ship their ores to the Malaya area in the future (it was in that condition during the War), so almost all of what tin Japan requires will

Production and Imports of Aluminum
(in 1,000 metric tons)

	Production	From Korea & Formosa	From Foreign Countries	
1926 ..	—	—	7.5	7.5
1930 ..	—	—	11.7	11.7
1935 ..	2.7	—	13.4	16.1
1937 ..	11.1	2.0	11.4	24.5
1938 ..	15.4	3.9	23.8	43.1
1939 ..	21.7	7.5	36.6	65.8
1940 ..	26.5	8.7	3.1	38.3
1941 ..	50.4	15.1	..	65.5
1942 ..	75.4	16.1	1.9	93.4
1943 ..	108.0	24.8	3.0	135.8
1944 ..	109.5	27.3	4.3	141.1
1945 ..	16.5	3.6	0.8	20.9

Imports since 1942 are from Manchuria.

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have to be imported from South Asia. The major peacetime purpose of tin is for manufacturing tin plates, and if exportation of canned goods from Japan attains a higher level, she will find it necessary to import a larger quantity of tin. This depends, however, upon how much tin plates could be manufactured in Japan. If tin plates are to be imported, the importation of tin will necessarily decrease.

Aluminium: Once, during the War, Japan's annual production of aluminium exceeded 100,000 metric tons, but it remains to be seen how much Japan will be permitted to produce henceforth. Materials all depend upon importation. Before and during the War, bauxite was imported from Bintan Island in Dutch possession, south of Singapore, and the importation is being continued after the War, through the good offices of GHQ. The refining of aluminium calls for a great deal of electricity, and is a suitable industry for Japan. Should the Allied policy be so decided as to make Japan the producing center of aluminium for the Asiatic countries, the major portion of the refining installations in the factories will be retained. If however Japan is not permitted to produce beyond her peacetime needs, her productive facilities will be limited to 1-20,000 metric tons a year.

Magnesium: Japan utilized brine from the sea as material for magnesium, and had produced about 2-3,000 metric tons a year during the War. This metal has the least demand among peacetime industries and its production may be prohibited in the future. What small quantity may be required for peacetime use may be imported.

Manganese: Japan produced enough of manganese required by the chemical industry and the dry battery enterprises but had lacked that needed for refining metal, before the War. Japan had to import, in prewar days, about 70 per cent of her annual need of about 250,000 metric tons. If Japan is to carry on iron manufacturing on a creditable scale, she will have to depend on imported manganese ores.

Chromium: Japan has sufficient chromium ores underground to meet the demand at home. Before and during the War, none was imported and no imports are expected hereafter.

Antimony: Japan produced antimony only on a sample scale, and annually imported 2-3,000 metric tons, chiefly from China. Besides what was required for alloys, type manufacturing and war industries, Japan imported quantities before the War, for making cast articles for decorative purposes and exported them.

Quicksilver: Quicksilver is found in Japan only on a sample scale, and Japan's prewar requirement, amounting to about 250 metric tons, was mainly imported from Italy, Spain, etc.

Gold: Japan's prewar gold production was about 20 metric tons a year, with the major portion consumed at home for decorative and dental purposes. Prewar Korea also produced about 20 metric tons of gold a year. After the War, the gold production has been reduced to such an extent that its production may be regarded as nil. Measures to revive the enterprise are now being considered, and the output may eventually increase.

Silver: About 300 metric tons of silver was annually produced in prewar Japan, practically all of it as a by-product of copper and other minerals. The output after the War has been greatly reduced, with barely 40 metric tons in 1946 but rose to 70 metric tons in 1947. In the days of free economy, silver, in addition to its being used in ornamental artcraft, was used in settling international accounts.

Platinum: Japan, before the War, required about 800 kilograms of platinum a year. Hokkaido produced about 2-3 kilograms on a sample scale, but the majority of the need was satisfied by importation. The amount used for decorative purposes was comparatively small in Japan and much of it was for industrial purposes.

Petroleum: In prewar Japan, the civilian demand for petroleum was about 13,000 million gallons a year, of which domestic production accounted for only about 18 per cent. After the War, the production markedly dropped, but in 1947 the level rose to about 96 million gallons or 90 per cent of the prewar figure.

During the War, while Japan occupied the oil fields in the Dutch East Indies,

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the Japanese military authorities emphasized the uselessness of devoting energy in the manufacturing of petroleum products at home and moved the majority of refinery installations to the South. As a result the refining installations remaining at home today are quite inferior in both scale and quality. Consequently, the Strike report points out the uneconomical nature of refining oil in Japan and suggests that Japan hereafter export her crude and import refined oil.

XIII. Agriculture, Live Stock and Foodstuff Industries

Agriculture, as a means of national livelihood, occupies top position in Japan. Although her national economy of recent years has been leaning markedly toward manufacturing, yet about one-half of the entire population still engages in agriculture. The area of cultivation per farmer in Japan is 0.43 hectare which corresponds to about 1/30 of that in America, 1/6 of that in France and 1/5 of that in Germany. Compared with the Netherlands, long known for her small size of arable land, Japan ranks even one-third below that country.

After the War, farmland reform has been carried out, prohibiting the presence of large landowners. This has phenomenally improved the economic life and general status of many of the farmers who have been tenants. However, this does not mean that the land in any way has been increased; that is, the acerage per farmer remains the same as before. The only apparent difference consequent to this farmland reform is that those farmers, who as tenants had hitherto had part of their harvest taken away by landowners, now have become independent farmers.

The fact that about 30 farmers would have to till the same size of land that would be tilled by a single farmer in America, has necessarily subjected the land to most intensive use, making Japan the highest consumer of fertilizer per arable land unit in the world. It has also made agriculture in Japan realize incomparably large returns per the same unit of farmland in the world, but the standard of living of farmers is considerably low.

Rice is cultivated on the largest scale in Japan. Shown below are the general conditions regarding cultivation of rice and other key farm products.

Rice: Rice is said to have been originally grown in India. It is extensively cultivated in Japan, with cultivation taking up 43.4 per cent of the total farming area, extending even to some cold districts in Hokkaido. Rice forms the staple food of the Japanese and is thus grown everywhere in the country; it is raised in some places which seem unfit for its cultivation. Even then, Japan's total annual rice production amounted to about 300 million bushels which was far from being sufficient to feed the whole population, and used to import, before the War, about 70 million bushels from Korea and Formosa.

It is unthinkable, therefore, that Japan will become self-sufficient in rice within her own boundaries.

Any spare area that could be turned into farmlands with more or less labor has been cultivated, even to the hills and mountains. It is therefore difficult to achieve marked increase of rice by land reclamation. There is much room for improving agricultural technique or application of fertilizer, but even then it is hopeless to realize self-sufficiency in rice. Postwar Japan has been making strenuous efforts to ration foodstuffs by mobilizing, besides rice, whatever is edible, including barley, wheat, oat, potatoes, sweet potatoes, beans, etc. Still a considerable amount is lacking and the gap is being filled, by American goodwill, with imported foodstuffs.

The consumption of rice as staple food is a traditional custom of the Japanese, but from the point of dietetics today,

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Farming Population
(in 1,000)

		Male	Female	Total
	Total	16,360.5	17,884.4	34,245.9
Farmers principally or partly engaged	Farmer principally engaged in agriculture	6,173.1	8,297.8	14,470.9
	Farmers partly engaged in agriculture A	1,230.3	619.7	1,849.7
	„ B	1,532.7	632.6	2,185.3
	Employees constantly hired	59.4	48.3	107.7
	Not engaged in cultivation of their own lands	7,365.1	8,285.8	15,650.9
Ages (according to Japanese counting)	12 years or under	4,642	4,592	8,234
	12—20 years	3,234	3,306	6,541
	21—35 „	2,864	3,869	6,734
	36—50 „	2,554	2,792	5,346
	51—61 „	1,598	1,577	3,175
	62 years or above	1,465	1,745	3,211

As of Aug. 1, 1947.

Arable Land in Japan
(in 1,000 chobu*)

Year	Total area	Arable lands Paddy fields	Arable lands Ordinary farm	Arable lands Total	Arable lands %	Pasture & wild lands Area	Pasture & wild lands %	Forests Area	Forests %	Others Area	Others %
1912	38,922	...	...	5,856	15.0	2,265	5.8	18,905	48.6	11,894	30.6
1930	18,505	3,204	2,711	5,915	15.4	3,239	8.4	20,044	52.0	9,304	24.2
1936	38,573	3,217	2,868	6,085	15.8	3,354	8.7	21,035	54.5	8,007	21.0
1920	...	2,987	2,359	5,346	...	1,503	...	20,872	...	...	...

* (chobu equals to 2.45 acres)

Supply and Consumption of Rice
(rice year) (unpolished rice)

	Production (preceding year) (1,000 koku)	Imports From foreign countries (1,000 koku)	Imports From former colonies (1,000 koku)	Imports Total (1,000 koku)	Exports to former colonies (1,000 koku)	Carried forward to next year (1,000 koku)	Consumption (1,000 koku)	Consumption per capita koku
1919–1925	58,339	2,938	5,111	8,051	907	6,593	65,485	1.13
1926–1930	59,452	2,110	8,084	10,196	796	6,464	68,808	1.11
1931–1935	61,029	611	12,015	12,628	1,003	10,684	71,812	1.09
1936–1940	65,190	1,795	10,858	12,653	696	8,455	78,081	1.10
1940	68,964	7,984	3,179	11,163	944	4,357	78,887	1.08
1941	60,874	9,827	5,276	15,103	1,002	7,070	72,262	0.98
1942	55,802	8,744	6,937	15,681	700	2,352	75,501	1.02
1943	68,003	5,277	1,811	7,088	773	2,612	74,058	1.00
1944	62,852	—	4,800	4,800	450	2,305	67,509	0.91
1945	58,969	—	1,572	1,572	400	765	63,151	0.84
1946	46,612	4,521	—	4,521	—	—	—	—
1947	57,490	—	—	—	—	—	—	—

The "rice year" covers a period of 12 months from November of the previous year to October of each specified year. For production are given the figures for the previous year in each instance. Since 1941 the figures include the early crops for the year. The figures of exports and imports include those for re-export and re-imports to former colonies. The consumption figures are the balances of subtracting exports and carried-forward figures from the sums of production and imports. The 1945 consumption figures include those of discharge out of the stock having been prepared against air-raid emergency.

One "koku" is calculated at 0.145 metric ton.

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Japanese seem to be over-feeding themselves with rice. Especially the Japanese farmers take comparatively small quantity of side dishes and try to obtain nutrition only from rice. Rice is a carbohydrate with little albumen (The Japanese grown rice belongs to the variety that holds comparatively a large quantity of albumen; yet it contains only 6 per cent or so). As Japanese farmers attempt to obtain the necessary albumen principally from rice, he is bound to consume a large quantity.

After the War, the movement is becoming gradually widespread to reform foodstuff consumption in Japan. Promoters of the movement insist on the idea of reducing the consumption of rice per capita by furnishing more albumen. Actual experiments made in rural areas show that a farmer's family by keeping a single goat and consuming its milk can reduce the consumption of rice by 30 per cent; that is, their health requires only that proportionate amount of edible carbohydrate.

The Japanese government appears determined to carry on this campaign of education among the people. The draft food policy plan already published by the Economic Stabilization Board indicates that the objective of this rational food policy is to stop rice cultivation at the present level and, at the same time, to increase the ration of fish and other seafood and animal meat.

Even though this reform of foodstuff standard is realized, however, it would be necessary to import some rice in years of poor harvest, and such importation, if at all, will probably be made from the rice-growing countries in South Asia (from Siam, French Indo-China, Burma, etc.).

Wheat, Barley, etc.: The total output of barley, etc., in an average year, was: barley about 60 million bushels; wheat 40-50 million bushels; oats about 5 million bushels. Practically all of these was used for food. The amount of barley

Production of Wheat and Barley Group by Selected Years

(in 1,000 koku)

Year	Barley	Naked Barley	Wheat	Oats	Total
1926	8,569	7,411	5,897	1,984	23,891
1930	7,091	6,088	6,125	2,315	21,619
1935	7,288	6,616	9,656	1,949	25,509
1940	7,519	6,267	13,094	1,962	28,841
1941	6,499	6,753	10,665	2,230	26,147
1942	6,745	6,624	10,115	2,169	25,653
1943	5,266	5,281	7,990	1,230	19,767
1944	7,182	6,577	10,111	1,477	25,347
1945	4,968	5,175	6,892	1,167	18,202

Supply and Consumption of Wheat in Japan

(wheat year)

(inclusive of wheat flour in terms of grain at 75%)

(in 1,000 koku)

Year	Domestic Production	Imports	Imports from former colonies	Exports	Exports to former colonies	Balance	Consumption per capita
1926	5,897	3,651	20	780	492	8,299	0.14
1930	6,125	5,054	5	1,557	540	9,087	0.19
1935	9,660	2,990	84	1,855	1,027	9,848	0.11
1937	9,996	1,455	48	1,494	579	9,426	0.11
1938	8,972	490	32	2,792	672	6,030	0.08
1939	12,113	257	15	1,989	638	9,758	0.13
1940	13,094	1,298	..	950	...	...	...
1941	10,665	—	..	592	...	...	...
1942	10,115	—	..	592	...	...	...
1943	7,990	—	..	130	...	...	...
1944	10,111	—	..	20	...	...	...

Wheat year covers from July to June of next year. Production, however, covers the crops of the year.

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or oats turned over for live stock feed is very small.

Potato, etc.: Of late Japan has been producing sweet potatoes at the rate of about 40 million kintals, potatoes about 20 million kintals, or both together about 60 million kintals. Compared with prewar figures, the total shows some increase. Encouragement was given the cultivation of potatoes, during the War, to manufacture alcohol for fuel and the tendency has continued up to now. If converted to rice at the conversion percentage now used in rationing in Japan, the total of the potato output will amount —sweet potatoes to about 25 million bushels and potatoes to about 17 million bushels. Before the War, Japan shipped potatoes to the Philippines (although small in amount); the practice today has stopped.

Soy Beans: Demand for soy beans by prewar Japan was about 1,100,000 metric tons a year. Of this, 30 per cent was supplied at home, 55 per cent brought from Manchuria and 15 per cent from Korea. The soy bean is a highly important foodstuff for the Japanese; it is consumed in the shape of miso (bean paste), soy, tofu (bean curdle), sweetmeats, etc., occupying a major role in the national diet by providing the needed albumen. Manchuria is the greatest soy bean exporting country in the world, but it is now out of reach for Japan, while none is brought from Korea, and the Japanese are suffering from acute shortage. Before the War, Japan used to bring in about half a million metric tons of bean cakes a year from Manchuria which was utilized as feed or fertilizer. Japan at present is suffering also from the shortage of these bean cakes.

Corn: Corn is something for which there is comparatively small call in Japan. Before the War, Japan raised about 900,000 kintals a year at home and imported about 2,500,000 kintals. It was mainly used as feed at poultry farms.

Tea: Japan produced, before the War, about 50,000 metric tons of tea per year, out of which from 15,000 to 20,000 metric tons were shipped to overseas markets. During the War, much of the tea plantations was converted into farmlands to increase foodstuffs, and the postwar production has been reduced to about one-third of the prewar total. Even so, about 500 tons have been sent to America and Morocco. Japan features its green tea; some black tea was exported before the War, but the majority was green tea. Excepting the countries in Far East, the countries that consume green tea are found most in the desert areas of the world. Green tea provides vitamin C and is a necessity for people in those desert countries. The plantations in Japan are now being steadily increased and before long, prewar capacity for exportation will undoubtedly be regained.

Tobacco: Japan has been self-sufficient in tobacco, with an annual production of about 60,000 metric tons. Before the War, Japan imported some tobacco which was mixed with the domestic supply. The trade in tobacco, however, showed rather an excess of importation.

Production and Trade of Soya Beans
(in 1,000 metric tons)

	Production	Imports	Imports from former colonies	Exports to former colonies	Consumption
1926	386	421	180	4	893
1930	394	429	182	5	1,000
1935	292	522	128	3	939
1937	347	692	148	4	1,093
1938	348	670	141	4	1,155
1939	356	676	101	3	1,130
1940	310	589	...	.	849
1941	235	562	...	.	797
1942	301	612	...	.	913
1943	310	615	...	.	925
1944	267	680	...	.	947

Computed at beans of one "Koku" equals 0.129 metric ton (21.5 kin).
Figures for beancake are based on the assumption that 205 kin is obtainable from one koku of beans.

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Besides the feature farm products mentioned above there are, in grains, German millet, millet, buckwheat, etc.; in beans, French bean, red bean, etc. Vegetables are grown in large variety and are sufficient to supply the home demand, while in fruits, oranges, apples and some others are also sufficient to satisfy home needs. Some oranges have been exported. Industrial farm products, hemp, ramie, peppermint, insecticide, etc., have been dealt with in other chapters. Besides these, mention should be made of about 30,000 metric tons of rapeseed for rapeseed oil (about 120,000 metric tons before the War), rush that forms the material for floor mats, kiryu the material for willow baskets, "konnyaku" taro, (hydrosme root) etc.

One conspicuous feature of Japanese agriculture is the fact that 95 per cent of the cultivated land is producing foodstuffs that directly concern man's living. The land devoted to cultivation of livestock feed such as is seen abroad is very small and equally small is the area devoted to the raising of industrial farm products. Since sericulture is attached to Japanese agriculture, the production of mulberry leaves is the only one that amounts to a considerable figure (see Chapter IX Fiber Industry).

Thus, agriculture in Japan is solely engaged in the production of foodstuffs. In spite of this, the food is short and about 2 million metric tons must be imported. This amounts, by conservative calculation, to about $150 million (U.S. gold). However, as this is unavoidable, Japan's policy on foreign trade must call for the best available brains. The movement on food reform, as aforementioned, has been started but how far the objective will be realized is a problem to be seen.

Live Stock: The live stock industry is least developed in Japan. Geographers opine that this is probably due to inability of obtaining good feed on account of climatic conditions. Before the War, Japan had only three cattle per 100 people compared to 53 in America, 37 in France, 30 in Germany and 18 in Italy. There was only one pig per 100 people in Japan as compared to 45 in America, 37 in Germany, 17 in France and 8 in Italy.

At the same time, large tracts of land are devoted to the cultivation of animal feed in foreign countries but hardly any in Japan. The consumption of animal meat, consequently, is very small as is also that of milk. The lack of animal meat and fat is partly supplemented in Japan with marine products, but the absolute quantity is still short. Herein comes, as aforementioned, the need of a movement for the reform of daily food of the nation

Under these circumstances, leather has been found acutely short for domestic requirement, and Japan used to import, before the War, about 90 per cent of her needs or about 40,000 metric tons a year

Only poultry had reached the level that might be called one distinct industry before the War, and Japan had seen no need of importing eggs. However, Japan had to buy abroad, before the War, chicken feed amounting to ¥30 million; once she had to import as much as ¥20 million of corn from Argentina.

Foodstuff Industry: Some of key items may be given here of the foodstuff industry in Japan.

Liquor (sake), etc.: Japanese liquor, sake, uses rice as its material, and before the War, about 20 million bushels of rice was consumed for this a year. During the War, the amount to be distilled was restricted, and at present about 4.5 million bushels of rice is used for the purpose. The amount of sake distilled maintains about 40 per cent of the prewar output, but the rice is less refined and millet and other grains are mixed as substitutes for rice to maintain the output. The synthetic liquor distilled with a mixture of alcohol manufactured from potatoes and sweet potatoes also plays a part in maintaining the level. Some sake was shipped abroad before the War to fill the demand among overseas Japanese residents. The exportation of sake will become very small after this.

Beer: About one-third of the prewar amount of beer (about 26 million gallons) is being brewed at present, with practically no importation. Before the War, some was exported to South Asiatic countries. Raw material is sufficient since home grown barley is used.

Effervescent Drink: Japan used to produce about ¥20-30 million worth of

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soft drinks a year, exporting about one million yen a year. The overseas market for these soft drinks was chiefly Manchuria.

Sugar: Prewar Japan consumed annually about one million metric tons of sugar, all of which was imported from Formosa. Postwar Japan produces only about 50,000 metric tons within her own boundaries (40,000 metric tons being beet sugar produced in Hokkaido), and Japan will have to depend almost entirely on outside supply for sugar after this. From during the War, Japanese had been suffering from an acute shortage, and since 1947, through the kind assistance of the American Army, some Cuban sugar has been rationed. The importation of sugar will prove a serious burden on Japan's overseas trade in the future.

Flour: The annual flour milling capacity of prewar Japan was said to be about 60 million sacks (one sack about 22 kilograms), but actual output was 30-40 million sacks, with about one-third of its exported to Manchuria and North China. Japan in those days also engaged, at times, in importing the raw material from Canada and Australia and, having milled it into flour, to export it. Since the end of the War, this sort of exportation has been stopped, nor such can be expected to revive in the future because such industry as flour milling will develop in China hereafter.

Dairy Product: Japan, as aforementioned, is very weak in the live stock industry. Consequently, the dairy products are scanty. The annual butter production before the War was ¥6-7 million, with some of it exported. Cheese amounted to less than ¥500,000 with practically no exportation. The output of butter and cheese must be increased, in view of the proposed reform in the national diet, but even if the output be increased, there will not be much to spare for overseas trade.

There was a time when Japan imported a considerable amount of condensed milk from abroad, but since more than a dozen years ago or so, Japan has changed to an exporting country in this item. The prewar annual production was about $15 billion, with about ¥2 million sold overseas. Before the War, some foreign capitalized concerns were active in operating condensed milk plants in Japan.

As the demand for condensed milk at home will increase hereafter, exportation will be difficult if the output is to remain at the prewar level. But should milch cows be increased to swell the figure of the total output, some exportation may become possible. The Mohammedan people in the South Asiatic areas are fond of non-alcoholic drinks and demand a large quantity of condensed milk—a favorable outlet for Japan-made condensed milk nearer home. However, increased output of condensed milk will call for an increase of milk and a larger supply of sugar and tin plate. The annual prewar production of powdered milk in Japan was about ¥4 million and its export about half a million Yen.

Margarine: Japan's prewar annual production of margarine was about ¥1,500,000, with very little of it exported. With postwar Japan, suffering from the acute shortage of vegetable oil and finding even edible fat for national living very short and difficult to supplement, production of such items as margarine which is not indispenable in the daily life of Japanese has been extremely cut down.

Seasoning: Soy and miso (bean paste) occupy important positions for seasoning food in Japan, and both require a large quantity of soy beans. Since no adequate supply of soy beans is assured, postwar Japan has been suffering from their lack. Both soy and miso appeal to the Japanese palate. Some was exported before the War, but it was to satisfy the demand among Japanese abroad. Not much of both will be exported after this.

What was exported comparatively in large quantities before the War was the seasonings made principally of amino acid such as "Ajino Moto" and these created a fairly large demand abroad. The principal raw materials for this sort of seasoning products were wheat flour and hydrochloric acid, and when Japan's economic condition recovers more stability, their exportation may be revived.

Canned Goods: Canned goods stood as one of Japan's major export items for

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some years, with the annual prewar output totalling about 10 million cases (one case containing 4 dozens of one-lb. can) of which one half was exported. Amounting to about ¥80 million, the exported canned goods included those canned aboard fishing vessels and sent overseas direct from the spot, without going through Japan. The big overseas markets were in America and Great Britain, where mainly canned salmon and crab were shipped. Classified according to kind, about 80 per cent of the exported canned goods was marine products, with salmon and crab taking up more than one half of the total. Outside of marine products, canned oranges occupied a large figure.

Exportation of canned goods is considered possible of further development. But postwar Japan has lost the fishing grounds to the North, and inasmuch as the prewar exportation of canned goods consisted chiefly of salmon and crab hauled there, it may be hopeless for some time, at any rate, to restore former activity. However, there is no bottleneck in fishing for sardine, tunny, or the raising of oranges, and as some salmon and crab can be had in the seas around Japan, it is thought not impossible to restore the exportation of canned goods to one-third the prewar figure.

In this, however, there are the problems of tin plate for can-making and of importation of olive oil for fish canning. In spite of these difficulties, Japan is bound to make efforts to revive the industry, and as a measure to overcome the bottleneck, in some quarters a plan is considered to start joint enterprises with American canneries.

XIV. Fishing Industry

The fishing industry has a serious significance to the Japanese people. As stated in the preceding chapter, with a very small amount of animal meat, milk and milk manufactures available, had there not been the supply of fish and other sea food brought about by the fishing industry, the Japanese people would have faced great difficulty several centuries ago due to lack of animal albumen. The natural necessity of the Japanese people who live in this environment has markedly developed this industry to the extent that it now realizes the highest total catch in the world.

The fishing industry in prewar Japan accounted for (excepting sea weeds) about 3 million metric tons a year which is admittedly the largest in the world. It is more than twice that of the United States, two to three times as much as that of either Soviet Russia or China, about three times as much as that of Great Britain and four times that of Norway. The number of people engaged in the industry in Japan is believed to be about 70 per cent of that of the world and the Equator in the South.

After the War, the activities have been restricted by Soviet Russia in the North and by the Allied Powers in the South. In addition, immediately following the end of the War, the number of fishing boats was reduced to about one-half by war damage and the total haul in 1946 amounted to only about 1,600,000 metric tons (exclusive of sea weeds). In 1947 the number of fishing boats was restored almost to that of prewar figure and the total catch is estimated to have reached the level of about 2,210,000 metric tons. However, these estimates by the Japanese government are highly conservative, the actual figure being considered to be double or more.

Japan's prewar fishing industry total

Fishing Population in Japan

(in 1,000)

	Oct. 1940	Feb. 1944	Decrease %
Fishermen			
Operators	520.7	247.5	52
Employees	634.3	532.7	16
Total	1,155.0	780.2	32
Aquatic products producers			
Operators	60.4	25.6	85
Employees	207.6	150.0	28
Total	268.0	175.6	34

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corresponded to about 20 per cent of the world total of those days. If the number of Japanese engaged in the industry is about 70 per cent of the world total of those similarly engaged, it would make the catch per worker about 1/10 of other countries. Japan is over-populated; most of the fishing is carried out along the coastal areas and the methods are far from efficient; even so, the catch per worker is markedly low.

The Japanese are a people who consume a large quantity of fish and of a large variety, and it is necessary to remember that the price of fish had hitherto been comparatively high. Not much fish is caught in Europe and America for the table; they catch the fish, that live comparatively in the deep seas, by a large scale method. In Japan even the kind of fish none too abundant is caught and some of these command a high price.

After all, the fishery business is indispensable to Japanese national living. Some one has said that the seas surrounding Japan are Japan's pasturage, and they are correctly performing the role of a pasturage. Japan must reform her national diet hereafter, as stated in the preceding chapter, and it calls for a sufficient supply of albumen, and the source of its supply must be sought in the fishing industry.

To see the fishing industry restricted is a blow to Japanese livelihood. Permission for fishing should be granted the Japanese to the widest possible extent.

The shortage of gasoline and heavy oil is a factor in reducing the efficiency in Japan's fishing industry after the War. About one half of the fishing boats lost in the War had been replaced with new boats, the tonnage of fishing boats at the end of 1947 more or less exceeding the prewar total.

Yet, the shortage of gasoline and heavy oil is retarding the full activity of these boats and the catch is still about 73 per cent of the prewar total. With fish and other products under control as to price and distribution, which, in some respects, is proving rather discouraging to the fishermen, the presence of sea products on blackmarkets through illegal channels is really a regrettable fact. This, however, is a temporary aspect consequent to inflation; it will disappear when Japan's economic condition becomes more stabilized.

For the past four or five years, the hauling of sardines in the seas around Japan have been reduced to about one-third that of the prewar figure. The cause is found in a natural phenomenon occuring in the seas. Japanese sardines are believed to spawn in the seas near the southern tip of Japan. For reasons yet unascertained, their quantity has become remarkably small. The fact is

Fish Catches by Principal Kinds
(in 1,000 metric tons)

	1926	1930	1935	1944
Fishes	2,654	2,892	2,764	1,486
Sardine ..	630	791	1,434	371
Herring ..	551	327	221	369
Mackerel .	71	182	114	73
Codfish ..	160	113	179	87
Sole	62	77	67	72
Shellfish ...	129	123	204	182
Other marine products ..	176	137	132	256
Seaweeds ..	375	503	495	287
Total ...	3,334	3,655	3,595	2,211
Fish - farm products ..	70	75	157	293
Trawling ..	41	57	49	19
Fisheries in Far Eastern Soviet waters ..	* 48	* 41	* 62	—
Whaling ...	* 96	* 92	* 72	* 61
Grand total	3,589	3,920	3,778	2,584

* Estimate

Exports of Canned Aquatic Products
(in ¥1,000)

	1937	1938	1939
Crab	19,874	15,244	30,323
Salmon	18,626	28,383	27,092
Trout	8,865	10,079	8,906
Tunny, oiled ..	7,786	4,067	7,221
Tunny, others ..			1,639
Sardine, tomatoed	8,757	4,975	5,482
Sardine, oiled ..	381	223	185
Sardine, spiced	2,038	2,346	440
Sardine, others			1,815
Mackerel	1,683	680	872
Herring	925	848	428
Other fishes	1,047	1,823	2,032
Earshell	421	301	518
Clam	75	25	59
Other fishes & shellfishes ...	971	1,510	2,154
Total	93,358	92,390	151,083

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creating considerable effect on postwar Japan. Large quantities of cuttlefish, on the other hand, are being hauled in; so much so, that Japanese are fairly fed up with the ration. The presence of so much cuttlefish is not explained by experts of the marine industry. The aspects have been observed since toward the last period of the War, although the catch of sardines is said to be slightly improving since last year.

Products from the fishing industry have formed one of the major items in Japan's export trade for years past, with about 30 per cent of the total sold overseas. Of these exports, about one-half was, as stated in the preceding chapter, canned goods, and of these canned goods, as also mentioned, crab, salmon and trout took up the largest part. About one-third of the exported marine products were shipped not only to China but to the Chinese in South Asia as well.

The exportation of these dried sea food as materials for Chinese dishes has a history of about 300 years and they have been one of the traditional export articles. With the policy in China likely to change, their exportation hereafter may become difficult. With the catch of crab, salmon and trout in the North practically lost and the sale of dried sea food in the Chinese market almost impossible, the Japanese would have to make strenuous efforts to cultivate new markets for the exportation of their marine products.

It is true that some crab, salmon and trout, etc., can be caught within the territorial seas of Japan and their exportation as canned goods may be possible to some extent, while sardine, tunny, bonito, etc., may be had in larger quantities depending upon the work of the Japanese fishermen, and they are suggested to concentrate their energy and effort to the fishery in the southern seas.

Aquatic Production
(in 1,000 of metric tons)

	1930	1935	1947
Provisions:			
Dried fishes cut ..	19.6	21.8	—
of which Bonito ..	6.2	7.5	—
Dried small fishes	109.4	101.3	72.3
of which dried cuttlefish	13.4	6.7	5.8
of which seaweeds	60.6	52.0	17.4
Salt-dried	47.0	57.6	15.4
Boiled-dried	60.2	75.0	53.6
of which sardines	44.4	59.8	45.8
Smoke-dried	1.4	0.7	—
Salted	54.3	72.2	59.6
Others	95.3	140.5	—
of which slabs of pounded fish	72.0	85.5	—
of which laver, dried	1.7	2.8	40.8
Total	387.2	469.1	—
Fertilizer	231.5	374.5	—
Sardine meal ...	10.1	19.7	0.6
Fish oil	43.9	63.3	—
Agar-agar	1.4	2.5	—

Exports of Aquatic Products
(in ¥1,000)

	1937	1938	1939
Seaweeds	2,698	2,638	7,342
Tunny	655	470	1,433
Bonito	49	462	141
Hair-tail	11	34	33
Scallop	377	253	212
Other fishes & shellfishes	3,942	5,352	7,803
Codfish, dried ...	1,523	481	658
Shark-fin, dried ..	508	447	944
Dried Bonito	257	638	784
Other fishes, dried	615	849	1,132
Cuttlefish	2,202	977	4,723
Shrimp	154	151	366
Sea-cucumber	1,578	2,350	6,668
Ear-shell	771	105	1,036
Oyster	299	35	133
Shell-ligament	1,351	1,257	5,557
Other dried shellfishes	129	31	160
Other dried fishes	154	323	1,055
Salmon, salted	785	746	1,844
Trout, salted	1,992	2,155	9,968
Codfish, salted	136	64	130
Other salted fishes & shellfishes	262	366	1,207
Fish livers	—	—	6,046
Boiled fishes	894	811	1,153
Laver	567	791	1,389

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XV. Forestry and Wood, Bamboo Industries

Japan is a country composed of a number of small islands grouped together, but, having a large number of mountains of comparatively high altitudes, 55 per cent of the territory is forested. This should supply an abundance of timber, but owing to the rugged topography, the transportation facilities are poor. Besides, to cut too large a quantity at one time is not permissible from the point of flood control. So the timber output is not large as it might be supposed.

The proper amount of timber to be taken out of the forests a year is set at about 20 million square meters. During the War, the amount was increased to nearly 30 million by sheer necessity, and as a result many places in the country are threatened with the danger of flood. Japan, consequently, may not cut more than 20 million sq. m. a year for the time being, whereas it is estimated that Japan will need about 80 million sq. m. of timber to recover from the war damage. If the annual output is restricted to 20 million sq. m., and deducting out of this what is required for pulp and what is annually needed for supplementing consumption in other fields, the amount that may be turned over the rehabilitation work will be less than 7 million sq. m. This means that it will take more than 13 years to furnish fully what is necessary for rehabilitation work.

Thus it is imperative for Japan to import timber from abroad, but timber conditions abroad are none too good for large scale exports. When thus considered, the prospects of Japan's rehabilitation are anything but rosy. However, there are many natural forests left, untouched by man, in the South Seas area and some of the Japanese lumber interests have had experience in opening these forests before the War. It is thought necessary that Japan should make efforts to obtain permission of the authorities in that area to import timbers therefrom. If this attempt proves successful and the importation of about 5 million sq. m. a year from that area is made possible, Japan's rehabilitation might be completed with favorable speed.

The amount of standing timber in Japan is estimated at about 2,000 million sq. m., one half of which is latifoliate and other half, coniferous. Most of the lumber wanted for the rehabilization work today is of the coniferous kind; there are some of superior quality among the latifoliate but most of them are difficult to work upon and the majority of them is being used for firewood and charcoal.

In this field, there is much left to be studied by Japanese scientists to the end that latifoliate wood should be utilized more extensively. Among the latifoliate trees in Japan, the chestnut as railroad ties and "Nara" (a kind of oak) as material for furniture have been sent abroad in fairly a large quantity. The exportation to these should be continued hereafter.

Bamboo Industry: Prewar Japan with the bamboo forests totaling to 150,000 hectares had an annual bamboo production worth about ¥5 million. Bamboo is a feature product of East Asia and has its own uses. Before the War, about ¥800,000 worth of bamboo a year was shipped to different markets in the world, and it is thought possible to increase the total of this exportation if scientific research is made by the Japanese for utilization of bamboo to a wider extent.

Wooden Manufacture: Japan's prewar exportation of wooden manufactures reached more than ¥10 million a year not including what was shipped as lumber, nor the wooden parts used in mechanical equipments. Among the items manufactured with wood as their major parts were: wooden toys, handles for umbrellas, bats for baseball, rackets for

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tennis, skiis and such sports goods; book ends, cupboard, bucket, barrel, etc.

With the prospects of demand and supply highly gloomy, it will be difficult to realize the exportation of timber in large quantities in their natural shape, and the wooden manufactures such as mentioned above, will be easily increased if there are demands abroad, without embarrassing the rehabilitation work at home. Only, Japan will have to import varnish and some raw materials.

Bamboo Manufacture: Mention has already been made of the exportation of bamboo; in addition, prewar Japan used to ship abroad annually about ¥2 million worth of bamboo manufactures, principally, fishing rods, screens, baskets, walking canes, etc. These have long enjoyed a favorable reception the world over as special products of the Orient, especially of Japan. The bamboo cigarette holder was exported at one time to the amount of half a million Yen a year. Its price is quite low but it had a unique feature as an item among export articles. Its demand abroad might yet increase provided its productive method be further studied and a holder more attractive in quality, appearance and price be offered.

Exports of Bamboo and Bamboo Goods
(in ¥1,000)

	1937	1938	1939
Bamboo			
Madake	67	122	119
Kurochiku	9	12	13
Mosochiku	79	233	332
Other bamboo ...	699	764	896
Bamboo goods			
Fishing rods	547	443	247
Blinds	329	280	359
Baskets	308	138	150
Walking sticks ...	...	...	109
Toys	311	82	78
Japanese parasols.	313	180	210
Fans	466	375	574
Others	975	894	973
Total	4,103	3,523	4,060

Exports of Timber
(in ¥1,000)

	1937	1938	1939
Railway sleepers	467	286	3,674
Veneers (Lauan)	9,002	6,064	9,693
" (others)			2,806
Packing shooks of wood box (Lauan veneers) ...	2,720	2,696	104
Packing shooks of wood box (other veneers) ...			1,954
Packing shooks of wood box (Pines: Ezomatsu & Todomatsu)	2,842	1,558	2,461
Packing shooks of wood box (others)	1,551	2,490	3,746
Packing shooks of wood (barrel)	261	438	639
Match sticks or splints	388	662	794
Wood shavings for match boxes	298	509	893
Lumber (Nara)	9,755	5,733	6,477
" (Sen)	129	44	59
" (Yachidamo)	59	54	160
" (Kaba)	107	69	188
" (Nire)	201	132	358
" (other broad leaved trees)	1,197	1,327	3,773
" (cedar)	1,000	6,924	42,699
" (pine)	735	2,921	10,322
" (other coniferous trees)	354	622	1,831
Logs & cants (Nara)	114	455	717
" " " (Shina)	545	942	1,239
" " " (Yachidamo)	69	39	41
" " " (other broad leaved trees)	341	514	1,758
" " " (cedar)	2,224	7,260	17,025
" " " (pine)	756	1,813	6,625
" " " (Ezomatsu & Todomatsu)	202	3,148	7,475
" " " (Karamatsu)	43	54	103
" " " (other coniferous trees)	53	133	1,033
Total	35,412	46,887	128,647

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Imports of Timber

(in ¥1,000)

	1937	1938	1939
Ebony with white streaks	380	197	126
Other species of precious wood	435	49	39
Teak	2,852	1,405	1,068
Cedar (for pencils)	363	141	139
Cedar, pine & fir (not exceeding 60 m/m in thickness)	239	44	2
Ditto (not exceeding 200 m/m in thickness)	2,445	1,544	1,299
Ditto (exceeding 200 m/m in thickness)	19,739	3,956	4,085
Ditto (logs & cants)	18,854	7,497	8,283
Kiri (Paulownia tomentosa or paulownia fortunei)	821	289	593
Aspen (Populus baesamifera var. suaveolens and populus tremula var. villosa)	727	608	718
Others	17,962	12,448	15,974
Total	64,817	28,178	32,326

Production, Imports and Exports of Timber

(in logs) (in 1,000 koku)

	Production	Imports from former colonies	Imports	Exports to former colonies	Exports	Stock at year end	Demand
1930	36,539	10,413	8,691	900	910	14,289	63,611
1937	66,207	8,380	7,624	5,723	1,925	24,525	74,402
1937	71,294	6,703	1,369	5,887	2,774	24,736	74,308
1938	79,895	4,752	2,102	5,099	5,755	27,372	73,254
1939	94,536	3,699	2,564	5,258	12,340	24,707	85,867
1940	92,479	5,227	2,715	7,887	6,476	22,351	88,414
1941	96,214	3,881	1,439	4,828	2,580	30,052	88,425
1942	89,444	1,532	232	2,768	1,259	24,776	92,456
1943	100,242	127	11	589	553	30,626	92,880
1944	104,055	1,545	40	1,305	500	30,225	104,640

Exports of Wooden Goods

(in ¥1,000)

	1937	1938	1939
Chip braids	12	18	17
Handles of umbrellas and parasols	621	295	362
Tennis rackets	345	239	207
Other sports goods made of wood	84	76	103
Wooden boxes	582	366	423
Sticks	...	...	225
Wooden toys	4,972	3,107	2,387
Wooden moulds	...	...	442
Other wooden goods	9,158	9,334	9,463
Charcoal	45	172	176
Total	15,819	13,607	13,805

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Areas of Forests and Standing Timber in Japan

	Year investigated	Forest area 1,000 chobu	Standing Timber (in 1,000,000 koku) Coniferous trees	Broad leaved trees	Total
(Hokkuido)					
Crown	1944	880.6	125.1	286.2	411.4
Government	1938	2,521.3	484.7	629.8	1,114.3
Private	1934	2,223.1	94.6	312.2	406.8
(Other prefectures)					
Crown	1944	435.4	176.1	58.8	235.0
Government	1942	4,209.9	570.3	1,138.7	1,709.1
Private	1941	13,612.4	2,222.3	1,198.3	3,420.5
Total		23,882.7	3,673.1	3,624.0	7,297.2

XVI. Railroad and Maritime Traffic Business; Rolling Stock and Ship Building Industries

Railroad: Both national and private lines combined, Japan's railroad in 1947 measured about 25,000 kilometers, with 7,600 locomotives, about 18,000 passenger coaches and 132,000 freight cars. What may be considered a setback in Japan's railroad system is the fact that the government railroad that takes up about 75 per cent of the total length of the track is all narrow guage. (Some of the private lines run on the standard guage.) Owing to this, the trains can not put on as much speed, and this has been the source of headache on the part of the authorities concerned for the past 40 years.

It was in 1877 that Japan saw her first railroad. The narrow guage was adopted at the time on the suggestion of foreign engineers who claimed that, since the country was mountainous, the narrow guage was best suited for general conditions. Since then the system has been extended and has kept extending up to now. About 40 years ago the authorities began realizing that the narrow guage was a deterrent to speedier service. But, by that time, the narrow guage had been extensively constructed and its wholesale re-construction would call for an enormous outlay. So it has been left in its present state up till today.

Mountainous as the country is, the narrow guage would have been advantageous to build, but anyone would agree today with the view that had it been possible to foresee Japan's industries would develop to the present magnitude, the system should have been unified into the standard guage despite some difficulties. But, to re-construct the

State Railways

	Operating lines km	Locomotive set	Tram-car set	Passenger set	Freight-car set	Number of workers men
1935	16,836	4,124	1,450	9,514	69,940	218,352
1936	19,354	4,235	1,553	9,640	73,184	227,689
1937	17,753	4,232	1,597	9,936	75,292	253,247
1938	18,065	4,443	1,626	10,288	80,338	272,175
1939	18,234	4,735	1,641	10,645	87,373	309,017
1940	18,370	5,095	1,701	11,037	96,972	339,610
1941	18,455	5,200	1,805	11,344	101,222	384,559
1942	18,545	5,365	1,828	11,440	105,835	401,772
1943	19,589	5,794	1,963	11,598	113,997	470,556
1944	20,187	6,236	2,143	11,675	120,747	524,663
1945	19,646	6,204	1,950	11,028	118,297	558,202
1946	19,648	6,706	2,038	11,724	123,817	593,086

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Local Railways

	Operating lines km	Locomotive set	Passenger-car set	Freight-car set	Number of workers men
1935	6,976	893	4,338	11,236	40,670
1936	7,039	808	4,291	10,989	40,562
1937	6,862	766	4,233	10,017	41,836
1938	6,748	726	3,980	10,816	43,330
1939	6,775	719	4,079	10,837	49,183
1940	6,725	727	4,089	10,820	54,433
1941	6,755	752	4,159	10,955	58,944
1942	6,803	765	4,534	11,242	62,587
1943	6,672	710	4,333	9,913	—
1944	5,856	685	4,362	9,082	88,392
1945	5,894	708	4,308	9,138	85,073
1946	5,899	690	4,237	8,466	91,111

narrow guage system already extending over 20,000 kilometers, especially for war-defeated Japan, is out of the question.

Under these circumstances, Japan's railroad system, before the War, as one of narrow guage, had been developed in efficiency to the utmost technically possible extent. The system had enjoyed international reputation for precision of departure and arrival of trains, management of freight cars, maintenance of tracks, etc. The railroad system in Japan today, however, due to abusive wartime operation, damage by air raids, shortage of coal, etc., has lost its prewar aspects; it has nothing of which it might modestly be proud. Some improvement is being made, at present, however little.

The traffic capacity of the railroad has become intolerably inadequate, giving unfavorable effects to different quarters in economic circles and which is creating confusion in the railroad traffic in turn. In postwar Japan today, the freight traffic is more than the prewar figure while transportation capacity, on the contrary, has decreased, bringing about the prevailing chaos. However, as Japan's industries have recovered only to 40 per cent of the prewar level, the greatest cause answerable for the congestion of freight traffic is the marked decrease of seaborne traffic on account of vessels sunk during the War.

Whereas it is common in an island country like Japan to depend on marine transportation for the movement of 70 per cent of freight at home, postwar Japan has no such ability. This is necessitating the use of railroad in transportation even of so bulky a cargo as coal which is highly uneconomical, and which further accentuates the lack of transportation facilities. Japan's railroad, apportioned to territorial size, would come to 5.4 kilometers per 100 sq. k.m. The figure would be 4.8 k.m. in America, O.4 k.m. in Soviet Russia, 14.1 k.m. in England and 7.8. k.m. in France. When one remembers the fact that Japan has many mountains for the size of her territory, the system may be considered fairly well developed.

It may be added, however, that the mountainous topography is retarding much the development in transportation by motorcar. When one considers, also, that Japan extends from South to North, there is no reason to doubt that the railroad system should be developed still more.

Maritime Traffic: Prewar Japan occupied, next to America and England, the third position in the world as a maritime country, with a total of 6 million tons of merchantmen that operated over the seven seas. Japan has lost practically all of her best class vessels in the War, with now a total tonnage of about 1,400,000 and gone down to 7th position in the world. The majority of what ships Japan has today consists of the wartime standard type poor in efficiency. Japan's condition today is such that she can no longer be called a maritime country.

The steamers Japan had at the outbreak of the War was about 6,400,000 total tons (statistics by the Ministry of Transportation), and she built about 3,600,000 tons during the War. She lost, on the other hand, about 8,500,000 tons

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Freight Transport by State Railways

(in 1,000 metric tons)

	1944/5	1945/6	1946/7	1947/8
Cereals and potatoes	7,365	5,600	5,184	6,651
Fish and vegetables	3,244	1,477	1,818	2,384
Coal	44,622	23,536	19,951	26,577
Charcoal	3,212	2,688	3,263	3,890
Textiles and textile goods	1,626	1,362	1,413	1,471
Paper and pulp	1,003	741	713	762
Fertilizer	1,968	951	1,454	2,547
Timber	18,841	11,284	10,369	12,854
Iron and steel	5,969	2,334	1,847	1,402
Total including others	167,355	104,522	109,673	109,354

From April to March next year.

Passenger and Freight Traffic by State Railways

	1936	1942	1946
Passenger-car kilometers (in million km)	1,009	1,345	916
Freight-car kilometers (in million km)	2,573	4,037	1,900
Train kilometers (in million km)	257	319	214
Passenger (number) (in millions)	1,059	2,280	3,176
Passenger km (in millions)	26,216	60,450	87,446
Freight (in thousands of metric tons)	89,342	147,616	76,750
Ton/km (in millions)	15,656	32,729	16,533
Revenue			
Passengers (in thousands of yen)	349,540	—	4,839,360
Freight (in thousands of yen)	285,960	—	1,106,070
Total (in thousands of yen)	653,430	—	6,267,240
Expenditure (in thousands of yen)	354,420	908,490	—

and what has survived the War amounts to only about 1,400,000 tons.

The tonnage of merchantmen to be allowed Japan will be stipulated in the peace treaty. According to the draft plan of reparations by the Far East Council published up to now, it proposes to dismantle all installations, other than what is necessary to build more than 150,000 tons of new ships a year and for repairing, in the maintenance of a merchantman fleet of 3 million tons.

Three million tons is what Japan had in 1920. Should Japan be prohibited to build large size ships, it would be impossible to engage in oceanic activities. This will certainly put Japan out of the picture to realize the prewar annual invisible revenue amounting to about ¥200 million. But, the 3 million tons of vessels will serve much in Japan's coastal traffic, relieving the railroad from its overtaxed transportation service.

However, it is a serious task for Japan of today to have a merchant fleet of 3 million tons. The 5-year economic plan announced by the Japanese Government in 1947 puts the total of new ships to be built in five years at one million tons. This, however, only sets out the "ideal" objective, and is not a definite plan based on the supply of materials and conditions. Should it be possible, as fill-gap measures, to charter foreign vessels or purchase old bottoms abroad, it would contribute a great deal toward the rehabilitation of Japan.

The Rolling Stock Industry: The rolling stock industry in prewar Japan had attained creditable progress, and not only filled the demand at home but had exporting capacity to some extent. The actual output figure for 1940 shows: steam locomotives 695, electric cars 1,262 and freight cars 9,914.

The installations suffered considerable damage by air raids and the industry has lost its efficiency by about 30 per cent in the production of passenger coaches, 18 per cent in that of freight cars and 28 per cent in that of locomotives. With all repair of plants completed, however, the industry is estimated to reach the annual production level of 850 ordinary locomotives, 200 electric locomotives, 2,000 passenger coaches and electric cars and 12,000 freight cars.

The repair of war damaged plants,

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however, in 1947, had reached about half stage while the building of new rolling stock, on account of the shortage of material, is not progressing as it should. The present situation shows more efforts made in repairing and renovating damaged stock rather than in building anything new. A large number of rolling stock awaits to be repaired, more than 15,000 locomotives, 45,000 freight cars, 46,000 or so of passenger coaches and electric cars, while the current monthly repairing capacity is about 10 locomotives, 5-60 freight cars, about 50 passenger coaches and electric cars. The condition is such that for the time being, major effort will be concentrated on the repairing end with the building of new rolling stock as a secondary concern.

However, the general condition is daily improving. After a few years, the building of new rolling stock will recover its normal capacity so that it may be possible that the railroad and electric rolling stock industry will develop into an export industry. Before the War, a considerable amount of Japan-made rolling stock had been shipped to Manchuria, China and other Asiatic countries.

The Ship Building Industry: Japan had achieved marked development in the shipbuilding industry before the War. The industry had an annual capacity for building 400,000 tons; during the War, it set a record of 1,126,000 tons (1943) and 1,579,000 (1944). These vessels newly built toward the end of the war were of the so-called wartime standard type, with the efficiency as ships decidedly inferior—far below those of the wartime standard type in America.

Japan, at any rate, had that much capacity in shipbuilding. The damage to the shipbuilding plants suffered in the War

War Damage Sustained by Maritime Transportation Industry
Since December 1941

Kind	Unit	Volume
Steamship	No. of vessels	2,320
"	gross tons	7,897,000
Motored sailing vessels	No. of vessels	2,070
" "	gross tons	189,000
Lighter	" "	471,000
Tug boat	horse power	19,000
Warehouse	"tsubo"	329,029
Goods in warehouse	metric ton	498,297
Plants concerned in shipbuilding	pcs.	670
State owned building	"tsubo"	27,100
Lighthouses seriously damaged		26
Lighthouses partially damaged		40

one "tsubo" 6 ft square.

Tonnage of World's Merchant Marine
(in 1,000 gross tons)

	June 1939	Increase thereafter	Decrease thereafter	End of June 1945	%
U.S.A.	11,362	38,800	15,530	36,632	53.7
Britain	21,001	13,390	16,470	17,922	26.5
Norway	4,824	30	3,000	1,864	2.7
Japan	5,630	3,600	7,500	1,730	2.4
Sweden	1,577	600	650	1,520	2.2
U.S.S.R.	1,306	750	550	1,506	2.2
Netherlands	2,970	150	1,800	1,320	1.9
Spain	902	300	150	1,052	1.5
Germany	4,482	3,450	7,000	933	1.4
France	2,934	50	2,080	904	1.3
Italy	3,425	400	3,200	625	0.9
Greece	1,781	—	1,200	581	0.8
Denmark	1,175	100	800	475	0.7
Others	5,128	400	3,640	1,888	2.8
World's total	68,500	62,020	61,570	68,956	100.0

Motorships & steamships of more than 100 tons

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was slight and it is able to turn out new vessels to the amount of about 500,000 tons a year now, provided sufficient materials are supplied. On account of the material shortage, the present building capacity is about 100,000 tons a year, and the industry today is devoting its major energy to the repairing of damaged vessels.

In 1948 orders for new ships have been placed with the Japanese shipbuilding yards by Soviet Russia, Norway, Denmark and other European countries. In most of these orders the clients have furnished materials.

Pending the decision on the building capacity to be allowed Japan, the future of the shipbuilding industry in Japan is uncertain. If, as aforementioned, Japan's shipbuilding capacity be limited to 150,000 tons a year for new ships, it will be impossible to obtain even the number of bottoms she needs at once. If, however, the amount of ships for Japan be limited to 3 million tons and the annual building capacity of 150,000 tons be allowed to maintain it, the figure will be reasonable, calculated on the basis of renewing the ships when they are 20 years old. The situation in Japan today is such that she will find it highly difficult to complete this 3 million tons of vessels.

Cargo Vessels at War End

	No. of vessels	Gross tonnage	Weight tonnage
Operable			
Freighters	399	726,731	1,221,841
Tankers	51	62,507	106,717
Total	450	789,238	1,328,558
Unoperable			
Freighters	116	317,499	528,515
Tankers	71	181,173	305,848
Total	187	498,672	834,363
Grand total	637	1,287,910	2,162,921

Source: Transportation Ministry as of Aug. 20, 1945.

Vessels Launched in Japan

	No. of vessels	1,000 gross tons
1926	32	52.0
1930	60	154.2
1935	94	132.4
1937	160	445.0
1938	155	443.5
1939	156	367.1
1940	110	482.6
1941	79	231.3
1942	172	424.8
1943	424	126.0
1944	665	1,579.6
1945	61	168.7

XVII. Land and Sea Transportation, and Warehouse Business

Here in this chapter will be mentioned an outline of the automobile, bicycle, airplane and wooden shipbuilding industries. The manufacturing light vehicles such as hand carts, horse carts, etc., although these form part of the transportation system, does not deserve strictly the term "industry" as is commonly understood.

Automobile: Previous to the China Incident, that is before 1937, there was nothing in Japan that could rightly be described as an automobile industry. Not that no automobile was built but only small sized cars and some trucks built on a sample scale.

It was in 1939 that automobile manufacturing in Japan started on a full-bodied plan. In that year, 1,755 ordinary cars and 34,442 trucks were built. Continuing, hence, till wartime, production was kept up, but as great effort was required in turning out airplanes in the meantime, the figure for the year, 1939, was the peak in automobile production. Thereafter, production gradually declined and after 1943, the production of ordinary automobiles was given up and all equipment and installations were devoted to that of making trucks. Even then the output of trucks did not increase.

During the six years, from 1939 to 1944, the total number of trucks built in Japan was about 152,000, but many of them were found far short of satisfactory service and Japan-made trucks were accord-

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ed less favorable reception among the Japanese units at the front.

Production of some trucks is being permitted in Japan after the War (9,268 trucks built in 1947) but that of touring motorcars is prohibited. Since the production of touring motorcars had been stopped during the War, no factory in Japan has any equipment to do so even if it be allowed.

The number of automobiles in prewar Japan was about 130,000 (besides about 80,000 small sized cars). In February 1946 the number was reduced to the level of 85,000. Since many of these remained idle, the number of those actually operated was about 55,000 (besides about 5,000 small sized cars) out of which 11,000 were passenger cars. This corresponds to about 43 per cent of the prewar figure and this decrease is seriously hampering transportation in Japan.

What is more difficult a problem to solve than the reduced number of vehicles is the lack of gasoline. Large numbers of vehicles are forced to stay idle on account of this fuel shortage. After 1947, some used automobiles have been transferred to Japan through the consideration of the Occupation Forces, with some gasoline supplied. This is materially helping out land traffic here to a considerable extent

When free trade is restored in the future, Japan is bound to import automobiles and buy gasoline from America. The motorcar traffic in prewar Japan was largely carried on with American-built motorcars, operating with gasoline imported from America.

Number of Motor Vehicles in Postwar Japan

	March 1946	July 1947
Number of vehicles		
Passenger cars	28,070	20,821
Trucks	92,649	81,971
Buses	12,841	10,945
Special cars	2,004	7,265
Total	133,564	121,002
Operable number of vehicles		
Passenger cars	9,127	12,702
Trucks	34,942	53,769
Buses	3,703	7,045
Special cars	554	3,678
Total	48,326	77,194

Bicycle: The bicycle constituted one major item among Japan's export articles before the War. In prewar Japan, bicycles had been popularized the same as the automobiles in America; whereas there was one automobile for every five people in America, there was one bicycle for every nine people in Japan. The less developed general living conditions and the lack of well paved highways may be accountable for this popularity of bicycles in Japan, but sufficient supply of them at home must be considered the decisive factor in spreading bicycles everywhere. Japan is one of the countries in the world where the bicycle is most extensively used. The number of bicycles in prewar Japan was about 8 million.

The bicycle in Japan is produced, in

Agricultural Central Bank
(in ¥1,000,000)

	End of 1943	End of 1944	End of 1945	End of 1946	End of 1947	End of June, 1947	End of June, 1947 (new accounts duplicated)
Bonds issued	5.9	10.2	4.1	3.0	3.0	3.3	3.3
Deposits	351.9	652.8	1,312.5	2,000.7	2,000.7	1,676.0	1,674.3
Loans	39.7	49.3	45.8	903.9	903.9	786.3	786.3
Advances:							
On bills	—	49.0	95.7	382.9	309.8	558.5	503.7
On annual compensation	—	11.4	21.8	43.2	42.3	42.0	41.5
Total including others.	28.8	66.0	124.9	927.7	728.8	941.6	829.1
Security holdings:							
National bonds	174.8	300.5	720.4	1,111.3	1,111.3	913.5	913.5
Debenture & shares ...	—	295.6	340.8	339.8	164.3	339.2	164.4
Total including others .	331.9	612.4	1,117.6	1,542.7	1,283.6	1,344.1	1,085.6
Deposits	14.7	11.6	89.7	78.8	53.8	86.1	62.8
Cash	0.1	0.1	0.1	0.5	0.5	1.0	1.9

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most cases, at factories in parts or was dealt with in parts, and the number of bicycles produced completed is not definitely known, but it is estimated to be about 3 million. Out of this, about 2 million was turned over for domestic use and about one million exported, mainly to the Asiatic countries.

The bicycle industry that had once been so thriving has been showing a marked decrease in output after the War owing to many of the factories having been bombed out and to the shortage of materials. The production in 1946 was 92,000 and in 1947 about 178,000, with some of these shipped abroad but mostly taken up at home. The tire and tube for bicycles were manufactured, before the War, each about 15 million pieces or more a year but it dropped to the 3 million level in 1946 and 1947.

The bicycle and tire and tube for bicycles are undoubtedly the articles much expected in the overseas trade, but at present, on account of the shortage of materials and of wage trouble at home, the exportation is very weak. The production of bicycles, as stated above, is realized in the form of manufacturing parts by many small and medium sized plants, and unless standardization is strictly adhered to and the industry in general more rationalized, it might not acquire real competitive power in overseas trade. Before the War, some bicycles of slipshod make had been shipped abroad by sheer attraction of their being low priced, which fact proved very damaging to the general reputation of the bicycle industry here. Such should never be repeated.

Airplane: Since manufacturing of airplanes and the business air transportation will not be permitted Japan hereafter, there is no need to write much about airplanes here. Before the War, the Japanese operated commercial airways extending over about 22,000 kilometers, and the planes used in that operation were mostly of American make. It was after the outbreak of the War that the manufacturing of airplanes was started on a full fledged industrial basis in Japan. During the four war years, about 64,000 airplanes were built and the peak was 28,220 planes in 1944.

Wooden Ship Building: When, during the latter half of the War, Japan began losing the steel vessels one after another and the operation of the maneuvers became practically impossible on account of lack of transportation, the military authorities sought to supplement the transportation facilities with wooden vessels. They began mobilizing the motor-sailing boats at home or building wooden ships of the wartime type. As a whole, these had small capacity; the largest number of motor-sailing boats mobilized amounted to only 3,205 tons. The total of wooden ships built was 423,000 tons, but many of them, although the hull was completed, could not be commissioned because they had no engines.

However, the part played by motor-sailing boats or small size wooden ships in the peacetime coastal traffic should not be lightly regarded. In prewar days, the amount of coal or timber transported by these vessels reached quite a large figure, and should these small size ships be operated in a larger number, the traffic burden now imposed on the railroad would be much relieved and the operation of Japan's economy would become much smoother.

A fairly large number of these small vessels was lost during the War (about 650,000 tons lost in these small size vessels, including lighters), while the wartime type wooden ships built during the War proved to be of unsatisfactory efficiency, which withal has been causing the nation a great deal of postwar disadvantages. The small size vessels newly built after the War, have restored about one-half the prewar level. On account of the fuel shortage, however, all of these small size vessels are being prevented from operating in full force and are unable to contribute efficiently toward the recovery of Japan. It is hoped that means will be found to furnish these small size vessels with sufficient supply of fuel before long.

Warehouse: Although suffering much in the War, the warehouse business in Japan is now steadily recovering. However, as the total space is inadequate, it is certainly necessary to increase space along with the recovery of industrial activities.

The total space of ordinary commercial warehouses in Japan at the end of 1944 was 3,600,000 square meters. It had lost about 39 per cent of this during the War

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Operating Warehouses in 8 Largest Cities
(in ¥1,000,000)

End of month	Stock at end of month	Entered	Left
Aug. 1946	4,524.3	—	—
Sept. „	4,868.7	—	—
Oct. „	5,445.4	—	—
Nov. „	6,100.1	—	—
Dec. „	6,760.5	1,784	1,124
Jan. 1947	7,260.3	1,743	1,243
Feb. „	7,526.1	1,644	1,406
Mar. „	7,810.5	1,928	1,644
April „	8,333.1	2,427	1,904
May „	8,384.6	2,335	2,288
June „	9,653.0	3,539	2,389
July „	10,596.3	3,030	2,087

and had only about 2,220,000 sq. m. when the War ended. As this is decidedly short, plans were mapped out to increase space for the storage of industrial goods by (1) conversion of former military structures, (2) repairing of war damaged parts; and (3) by building additional warehouses under national management. The plans called for adding about 19,400 sq. m. during 1946, about 19,600 sq. m. in 1947 and efforts were made to that end, but owing to lack of materials and other deterrent factors, the work has not progressed as had been expected. Part of the plans has been completed and a major part is still in the process of construction.

Under the circumstances, the total space of ordinary commercial warehouses, at the end of October 1947 was about 2,600,000 sq. m. Out of this, about 32,000 sq. m. is placed under special requirement while about 23,000 sq. m., having been leased, is set aside from ordinary commercial purposes, leaving about 2,050,000 sq. m. for actual general service. Besides this, there is about 180,000 sq. m. of sheds built by the government and owned by public corporations.

As shown so far, the commercial warehouses at present have attained only about 58 per cent of the prewar level. With the resumption of free trade as a set prelude, the increase of warehouses is one of the problems that demands urgent solution in Japan.

XVIII. Communication Business and Communications Equipment nterprise

Communications Business: Practically all communications business is under government management with only the broadcasting business monopolized by an association. But even in this field the presence of formidable rival enterprises will soon be an actuality.

The postal business, as in most of the countries, was started as a government enterprise in Japan and has continued so up to now. Some setbacks peculiar to any government undertaking is here also observed, although some redeeming advantages are noted because the business is nationally controlled. The business had been known for its reliable service before the War, but following the end of the War, the general order has been much disturbed (at least for a time) and the non-arrival or delayed delivery of mail became common. Of late, much improvement in the service has been seen, but it is yet decidedly below standard as compared with what it was in the prewar days. The popular demand for a radical renovation of the service has been strong and insistent.

Telegraph: Telegraph business was also begun in Japan as a government enterprise and has continued so till now. Unlike the mail service, speed counts most in the telegraph service, and the Japa-

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nese have long realized the evils of monopoly. When speed in the service was tolerably good as in prewar days, the monopoly attracted little public attention as a problem for discussion. But when a telegram reaches its destination far behind ordinary mail or fails to justify its raison d'etre by slovenly service, in postwar days, the public voices its vigorous disapproval of the monopolistic enterprise. Lately, the service has shown much improvement but it is far from satisfactory. Opinion is gaining ground in some quarters to make it a civilian enterprise and permit two or three rival concerns to serve the public.

Telephone: Telephone, too, is a government managed enterprise. And the people have been acutely feeling for more than 30 years preceding the War the evils of monopoly. In Japan, long before the War, the right to install a telephone used to carry a premium. This strange phase in the telephone business, unparalleled anywhere else, was due to the fact that the necessary extension of the business could not be realized on account of the limited national budget while the rapid expansion of industries in general increased the installation of telephones everywhere. The government had been compelled to limit applications for installation, permitting a small number of applicants the privilege of using telephones, (deciding the number by drawing lots). This brought about eventually the offer of large premiums for the right of installation. This premium has developed into an invisible property, and the loans furnished with this invisible property as security had reached as much as ¥100 million before the War.

The premium still continues today, after the War, and it is a problem that calls for final solution one way or the other. Since the problem is an evil born of a government monopoly business which is hampered in its activity by the national budget, the public voice has long been heard to have it transferred to civilian management. Those profiting by the premium are opposing the idea of the telephone system being transferred to civilian management as it would mean, if realized, the disappearance of the security values of the right of installation. All others are strong in demanding to see it run by civilian management.

When the telephone system was first started in Japan, about 50 years ago, the

Communications Statistics

	1937	1944	1946	1947
Post Office:				
Windows	11,559	14,222	12,978	13,680
Collection office	5,514	5,833	...	5,279
Telegraph Office:				
Independent office	49	39	45	11,406
Handling P.O.	1,637	10,927	10,896	
Telephone Office:				
Exchange office	5,819	7,329	7,474	7,421
Message office	10,260	13,215	12,844	5,174
Telephone Service:				
Public telephone	4,142	5,052	970	...
Simple telephone	...	1,731	1,335	...
Other telephones	...	1,106	1,119	...
New telephone subscribers (in 1,000)	9,143	1,053	...	...
Telephone message:				
Frequency (in 1,000)	4,679	...	4,970	...
Hours	342,590	308,000	...	...
Telegraph messages (in 1,000)	64,952	258,000	306	...
Postal Service:				
Mails (in 1,000,000)	4,764	9,670	2,611	...
Parcels (in 1,000,000)	81	139	28	...
Postal Vehicles:				
Trucks	...	...	781	838
Post cars	...	...	454	459
Bicycle	...	...	30,759	28,531
Total revenue (in ¥1,000)	374,772	480,988	...	...

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government had intended to make it a civilian enterprise. But since no civilian would consent to undertake it the business has been run, ever since, under government management. It is universally conceded that the enterprise should now be given up to civilian management. As the actual value of the premiums have been greatly reduced on account of inflation today, opinions are rife that the transfer of the system to civilian management may be effected without much serious social effect if carried out at present.

The telephone system in Japan suffered much war damage, and, coupled with the shortage of materials to repair it, the system is providing a series of patience-trying hitches every day. The public is thoroughly disgusted with the service and is readily endorsing the idea of transferring it to civilian operation.

The broadcasting enterprise, too, has been a monopoly since its start in 1925, leaving it in the hand of a public corporation which was specially organized. It is believed the step was taken by the government at that time for the convenience of exercising control over public speech. It has been decided to abolish this monopoly and a law has already been passed to that end. It will not be long before rival concerns will appear on the scene.

Communications Equipment. The communications equipment enterprise is one of many which has achieved orderly development. Before the War, it exported telegraph, telephone and radio sets as well. In 1937, Japan exported ¥624,000 worth of telegraph sets, ¥4,086,000 worth of telephone sets and ¥2,577,000 worth of radio sets. These light electric mechanical devices should continue as export articles. As the factories producing these sets were mobilized, during the War, in turning out military communications sets, their technical skill is favorably comparable with that anywhere else. And as the industry depends much on handicraft work, it is best suited for the Japanese.

XIX. Finance and Insurance Business

Japan, common to any war defeated country, is suffering from inflation which, now still rampant, is creating confusion and distress in Japan's economic life. The industries closely related to financial organs, consequently, are experiencing much worry born of inflation.

Banking: The banks in Japan suffered from a panic in 1927 and some of them collapsed. Thereafter, the Japanese government adopted a policy of consolidating the banking business, with the less stable banks being forced to undergo adjustment or incorporation with a stronger one. Before the War, the number of smaller banks had been reduced; the banks had been freed from the fear of bankruptcy even in case of disturbances in the economic circles. The government had taken a decisive step of protecting all banks and national confidence toward banks was greatly enhanced.

After the War, when the danger of inflation became menacingly large as a result of the defeat, the government declared its promise to the banks no longer effective—the promise that had guaranteed these banks of the payment of loans advanced by these banks to the war industries during the War. The banks suffered serious losses consequent to this declaration while they saw part of the deposits in these banks "frozen" and eventually thrown out. The banks, therefore, in proportion to their losses had to reduce their capital to the extent of 90 per cent.

This forced a great clearing adjustment among the banks, after the War, and the adjustment was mostly completed during the first half of 1948. All banks, in view of the current inflation, have increased their capital and have made a new start. This has healed the wound the banks suffered from the War, and, should inflation assume no uglier aspects, the banks should be able to carry on their business without undue risk.

As Japan's economy is still under the spell of inflation, deposits are markedly small compared with the amount of cur-

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rency issued. Whereas the banks used to hold about two and a half times as much deposits as the amount of currency issued before the War, the deposits at the end of the first half of 1948 amounted to only about the same as that of currency issued. This means Japan's industries are strained to that extent in their capital. The smallness of deposit amount is due to the prevalence of cash transactions over blackmarket dealings and to the less prevalence of the credit currency in trade dealings but it is also due to the fact that a great majority of the people have spent the major portion of what they had saved in the past. All this candidly reflects the unhealthy economic conditions of Japan on the banking business.

Opinions differ as to the probable development of inflation in Japan, but since it is clear that the return to normalcy cannot be expected with the situation left as it is, views have been voiced in many quarters, since 1948, to wind up inflation in some manner. There is no doubt that the end of inflation is gradual-

Capitals of Principal Financial Organs
(in ¥1,000,000)

	1943	1944	1945	1946
Banks	56,328	77,927	119,829	144,869
Trust companies	4,225	4,902	5,719	5,437
Agricultural central bank	3,519	6,528	13,125	20,027
Agricultural associations	13,914	22,108	41,389	67,710
Credit co-operatives in cities	1,722	2,699	2,896	3,659
Mutual loan companies	1,379	1,791	2,152	3,223
Life insurance	—	9,573	10,346	9,255
Postal savings	19,081	35,035	48,755	59,611
Postal insurance	4,093	5,662	6,553	8,250
Total (including others)	104,261	152,225	254,072	325,649
Excluding duplication	94,358	130,752	215,472	267,112

Commercial Banks in Japan
(in ¥1,000,000)

Deposits:	End of 1943	End of 1944	End of 1945	End of 1946	End of June 1947
Total	43,131	60,962	102,364	124,706 (106,920)	137,502 (122,290)
Short term	16,316	15,982	28,025	56,278 (50,801)	67,391 (61,533)
Long term	21,585	28,574	32,749	24,697 (18,875)	20,848 (16,424)
Loans:					
Total	22,466	34,797	71,943	107,616 (39,145)	93,609 (35,530)
Without security	...	26,362	64,376	84,386 (18,428)	59,176 (31,166)
On security	...	4,789	3,593	19,475 (8,056)	27,338 (18,066)
Call loan	295	368	198	1,921 (1,896)	18,066 (921)
Security holdings					
Total	21,489	29,899	42,825	47,807 (42,515)	60,741 (45,210)
National bonds	15,137	22,880	35,125	40,653 (40,564)	52,940 (42,355)
Debentures	4,559	5,251	5,817	4,386 (1,801)	5,116 (2,548)
Deposits	959	1,479	4,531	7,190 (6,474)	6,093 (5,411)
Cash	1,888	2,257	3,755	8,545 (7,443)	10,389 (10,389)

( ) show accounts in new Yen

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ly approaching while the ideas in America on this problem appear steadily taking a definite shape. Many preliminary conditions are necessary to wind up inflation, and the time is not ripe for some of these conditions, but the adjustment of financial agencies is certainly one of them. The adjustment having been mostly completed by the first half of 1948, the frozen deposits were released in July 1948.

Insurance Business: The insurance business, in view of its nature, is handy to consider by dividing it into two—life and material loss.

Life insurance is a long term contract and its premium holds the nature of bank savings. Because of this, the life insurance companies hold an important position as a financial agency along with the banks, and these insurance companies, as it was stated in the part covering the banks, had suffered serious losses consequent to the stoppage of the guarantee for the payment of wartime loans to war industries. The losses included, in addition, the loss from wartime insurance, loss from financial aid to war industry firms and that from the devaluation of their own stocks.

But the life insurance companies completed their adjustment ahead of the banks; detached their old accounts and have started business with new postwar accounts. Some reorganized and some retained their structure, but practically all insurance firms have made a new beginning. Those that have reorganized their structure have changed from stock companies to mutual concerns.

The insurance of material losses in

Production of Motor Vehicles in Japan

	1935	1936	1942	1943	1944	1945	1946
Production:							
Trucks	1,181	5,004	34,786	24,000	21,434	6,723	14,062
Passenger	847	1,819	705	207	19	0	0
Total	5,851	10,239	35,491	24,207	21,453	6,723	14,062
Imported:							
Cars	934	1,117	—	—	—	—	8,620
Chassis	1,010	1,061	—	—	—	—	—
Assembled	30,787	30,997	—	—	—	—	—
Total	32,731	33,175	—	—	—	—	—
Exported to Former Colonies:							
Cars	626	1,731	1,180	1,599	213	—	—
Chassis	735	2,267	—	—	—	—	—
Total	1,361	3,998	1,180	1,599	213	—	—
Number of cars supplied	32,551	35,078	34,311	22,608	21,240	6,723	22,682

Life Insurance Contracts

	1944	1945	1946	1946 Alive	1946 Death
Contracts at beginning of year:					
In 1,000	28,304	33,720	21,123	6,148	24,975
In ¥1,000,000	53,219	68,618	73,517	7,050	66,457
New contracts:					
In 1,000	3,867	1,476	527	21	51
In ¥1,000,000	16,980	10,547	5,686	101	5,585
Death:					
In 1,000	335	560	237	20	217
In ¥1,000,000	625	1,183	521	26	495
Expired:					
In 1,000	303	259	107	44	63
In ¥1,000,000	224	226	105	48	57
Cancelled:					
In 1,000	19	1,851	303	9	294
In ¥1,000,000	53	834	731	50	680
Contracts at end of year:					
In 1,000	33,720	31,123	29,606	5,834	23,772
In ¥1,000,000	68,619	73,517	75,369	6,677	68,691

* 1946 covers April 1—August 10.

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Japan consists of fire and marine only and others, if any, are exceptional. And since theirs is generally a contract that runs less than one year, the blow suffered by these companies, compared with the life insurance firms, was much less. All of these firms have begun postwar business under new organizations.

Marine insurance, before the War, had close relations with foreign countries and used to carry on in collaboration with foreign insurance firms. Since the end of the War, there are no Japanese ships going abroad (except in some specific cases) and no collaboration is yet realized because there is no such need at present.

Financial Operation of Life Insurance Companies

(in ¥1,000,000)

End of month	Dec. 3 1941	Dec. 1944	Dec. 1945	June 1946	Dec. 1946
Deposits	301.0	300.0	487.2	843.4	344.0
Advances:					
Total	1,256.0	1,424.0	1,660.2	1,512.9	1,510.0
On immovables	161.0	139.0	119.8	129.9	217.0
On securities	385.0	418.0	406.1	379.2	319.0
On insurance contracts	329.0	316.0	432.7	402.7	375.0
Without security	380.0	550.0	701.6	601.1	599.3
Security holdings:					
Total	6,492.0	7,672.0	8,028.6	7,513.3	7,217.0
National bonds	2,713.0	3,503.0	3,826.6	3,788.8	3,774.0
Debentures & shares	3,131.0	3,399.0	3,395.6	3,200.1	3,287.0
Immovables	171.0	175.0	169.8	166.6	184.0
Total assets	8,314.0	9,819.0	11,242.2	12,200.7	12,831.0

Fire Insurance

(in ¥1,000,000)

	Insured amount	Premiums collected	Insurance amount paid	Percentage of fires
1936	28,730.5	100.9	31.1	30.8%
1937	33,706.7	114.4	26.2	27.8
1938	36,322.5	127.2	34.9	39.2
1939	43,730.9	153.3	20.8	37.5
1940	59,206.3	197.5	78.7	43.6
1946	—	860.9	661.9	76.8

JAPAN TODAY
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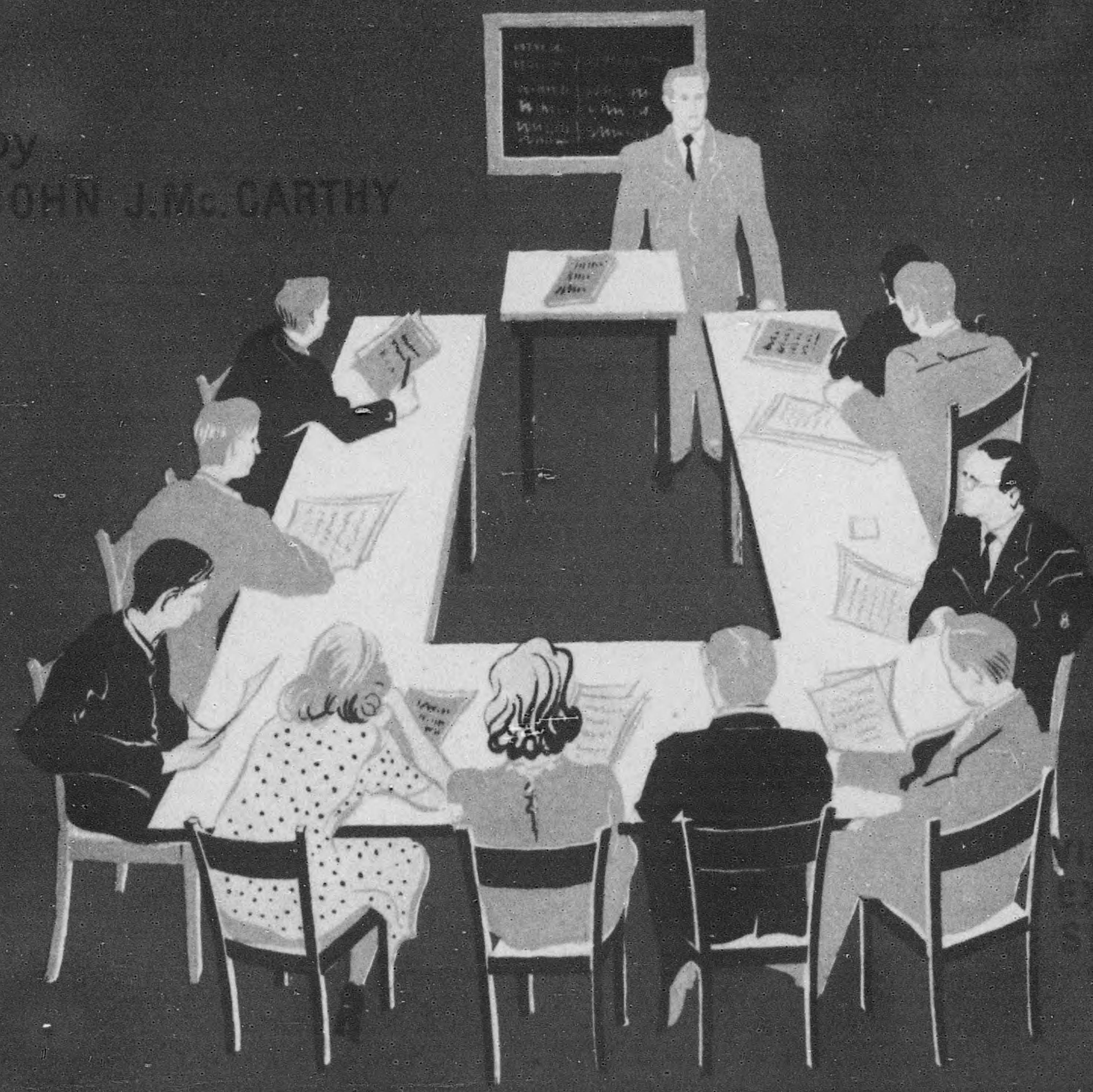
DEVELOPMENT OF SUPERVISORS IN GERMAN INDUSTRY

INTRODUCTION OF TRAINING-WITHIN-INDUSTRY "J" PROGRAMS

by
JOHN J. Mc. CARTHY



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MANPOWER DIVISION
JANUARY 1948

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OFFICE OF MILITARY GOVERNMENT FOR GERMANY (U.S.)
Manpower Division
APO 742 Berlin, Germany

DEVELOPMENT OF SUPERVISORS IN GERMAN INDUSTRY

Introduction of Training Within Industry "J" Programs

by

JOHN J. McCARTHY

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FOREWORD

A steadily increasing level of industrial production is generally recognized in Germany as essential to the economic recovery of Germany and to the development of a higher standard of living. The path towards economic rehabilitation in Germany, as in other nations, is a difficult one requiring the utmost cooperation of all elements of the population. In order to achieve the common goal, all avenues of approach which offer a reasonable chance for improvements in production should be studied and explored.

The effectiveness of Training Within Industry ("J" Programs), which was developed and applied through the wholehearted cooperation of American management and labor, has been demonstrated in the United States in winning the war and in reconversion for peace. The simplicity of the "J" Programs, which permits them to be widely introduced and to yield results within a short time, will, in our judgement, make it possible for them to make a significant contribution to Germany's ability to produce. The enthusiastic reception to the presentation of this program in Germany shows that German government, management and labor are alive to its potentialities for helping to overcome the problem of production.

The value of the program also extends into the field of human relations whose betterment it also serves. If management and labor in Germany cooperate around a specific project, such as the "J" programs, the result may well contribute much to an even greater degree of cooperation in other areas.

In his presentation of Training Within Industry, Mr. McCarthy has also performed the valuable service of demonstrating the relationship between the fundamentals of the "J" programs and the fundamentals of democracy. I am sure that all those who have come to know him will agree that this has happened because he gave of himself as well as of his technical knowledge.

Leo R Werts

LEO R. WERTS
Director,
Manpower Division

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NOTES ON THE AUTHOR

John J. McCarthy, New York, Corporate Personnel and Training Director, Gimbel Bros. and Saks Fifth Avenue Stores is a well-qualified executive in the field of sales training. Mr. McCarthy was director of training with the General Electric Corporation for seven years. For two of these seven years, he was concurrently Associate District Director for the War Manpower Commission (TWI Division for Southern New England). During his three years with the U. S. Army, he was successively Assistant Director of the Training Officers School, Supervisor of Supervisory Training Programs for Army Service Forces, a member of the Manpower Division of the U. S. Group Control Council at Berlin, and finally was in charge of organizing industrial training programs among the civilian population in the American Zone of Germany.

Mr. McCarthy served from 1935 to 1940 as editor of "Industrial Methods and Management", the official organ of the Industrial Methods Society. At present, he is the Director, (national) Distribution Division, Society for the Advancement of Management and a member of the New York Personnel Management Association.

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DEVELOPMENT OF SUPERVISORS IN GERMAN INDUSTRY

Introduction of Training Within Industry "J Programs"

NEED FOR SUPERVISORY TRAINING PROGRAMS

The urgent need for the initiation of progressive supervisory training programs in the Western Zones of Germany was first recognized in the autumn of 1945. At that time there existed in the Western Zones an acute shortage of building trade workers, a shortage of some 423,000 skilled workers. This shortage was made more acute by the critical housing conditions which existed at that time. With winter weather ahead, Germany faced not only the need for furnishing the German population with even adequate shelter but in addition faced the need for housing the occupation forces.

Along with the shortage of skilled building trades workers, there existed, paradoxically, a surplus of skilled workers from the heavy steel industry, munitions, aircraft and other war industries. Then, as now, the Allies intended to limit the need for manpower in heavy steel and allied industries, and to prohibit the use of labor in anything that might be considered a "war industry." The problem, then, became one of how to fill the gap that existed in the ranks of the building trades workers with new recruits from the workers from heavy industries who would have no opportunity to use their old skills.

This situation bore an ironic resemblance to the situation that existed in the United States at the outbreak of the war. At that time we were faced with urgent need for re-training, in the shortest possible time, millions of workers who were equipped with skills that were of value only to the "luxury trades." It became essential to supply them with skills that would assist war production.

This need was recognized in the States, even before the outbreak of actual hostilities, and a Training-Within-Industry Division was established in the War Manpower Commission. It was this organization that developed the three supervisory training programs that were destined to do so much toward bridging the gap that existed.

Notes: The views herein expressed are those of the author, and do not necessarily reflect the views of U. S. Military Government.

A German translation of the text has been published under separate cover.

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The need for one of these programs, Job Instructor Training, seemed to be the one possible solution to the problem that existed in Germany in 1945. This program gives the supervisor a start in developing a skill in instructing. It supplies him with a technique that will enable him to pass along his job knowledge in the shortest possible time, and to pass it along in such a fashion that the learner performs the job correctly the first time. It results in fantastic reductions in learning time, results in a given job being done in the same manner regardless of the number of employees who may be assigned to the task, and above all, gives the instructor the ability to break down difficult jobs into their basic components so that new employees may be assigned to each component and gradually trained on the remaining parts of the job. This, obviously, results in immediate production on each part of the job by each worker.

Mr. Leo Werts, now Director of the Manpower Division, OMGUS, and Mr. Don Snyder, then a member of the Manpower Allocation Branch of the Manpower Division, were the first to recognize in this Job Instructor Training program one of the answers to supplying the badly needed skills which would in turn assist in supplying the needed shelter.

Unfortunately, the nature of these training programs is such that a strong, nation-wide organization is needed to quickly spread the training and to insure a high quality training. In 1945 there was, of course, no semblance of a German government which was capable of carrying out such a program. For this and other reasons far too numerous to mention, the project had to be abandoned and the author and other interested individuals turned their attention to other methods which it was felt would afford some immediate relief to the problem.

For the past three years, however, both Mr. Werts and Mr. Snyder have remained aware of the great need for improving the quality of supervision in Western Zone industry and in the beginning of 1948 the author was requested to return to Germany to launch the first of the programs and finally in the early part of August it was possible for this trip to be made and the programs to be started.

It would seem that before a chronological history of the development of these programs is presented, that once again, the need for this training be made clear, as it exists under conditions prevailing at this time. An explanation of the content of each of the three programs will also be helpful.

NEED FOR PROGRESSIVE PERSONNEL MANAGEMENT TECHNIQUES

The author is aware of the grave danger of generalities and makes no attempt to generalize. It is recognized that there were in Germany a number of people who were sincerely interested in techniques of progressive personnel management. Unfortunately, it appears that these techniques were in large part contrary to the philosophies of the National Socialist Party and it was difficult for the few interested individuals to make any progress along these lines.

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Modern personnel management has as its foundation the recognition of the worker as an individual and has proven that this individual will be most productive when his employer indicates, by his treatment of the worker, that he considers him an individual. While there were, undoubtedly, a number of such employers in Germany, again, unfortunately, their number was limited - limited either because it was unwise to entertain such theories, or limited because Personnel Management had been thwarted in its growth by being denied a place in the sun of publicity and research.

For these reasons in 1948 we found conditions prevailing in Germany that can best be portrayed by one plant manager's reaction to an American observation that the light in a punch press department seemed to be most inadequate for the efficient performance of his employees. The manager's reply, given without a hint of anything other than complete objectivity, was, "Light is not too important; when the sun shines in the window, there is adequate light."

The claim is not made that this would be the typical reaction of every German plant manager. Quite the contrary would undoubtedly be the case; however, that any plant manager could remain blissfully unaware of the high price he was paying for fatigue, and that he could remain unaware of his moral obligation to safeguard the health of his employees, is an indication of the fact that he could not have been exposed to papers, speeches or any other form of contact with Personnel Management techniques.

These conditions are costing the American tax-payer real dollar bills. There are many Americans who are unable to understand why we should, at this time, give to Germany our "productive secrets." Aside from the fact that we, as a nation, have a moral obligation to spread any kind of information that will result in a better life for all the people of the earth, there is a very selfish reason for making these specific training techniques available. Just so long as Germany is unable to develop her peace-time industries to a point that will make the nation self-supporting, the American people are going to pay the bill that must be paid to keep a nation from complete privation. Accordingly, anything that can be done to expedite the development of German industry to the <u>break-even point</u> is money in our pockets. As our experiences of this autumn of 1948 have proven, these programs will assist in speeding the date of the break-even point.

Production is always, essentially, the product of manpower. Today, in Germany, with a shortage of machinery, the effective utilization of manpower is more essential than at any previous period in the modern history of the nation. The effectiveness of manpower can be destroyed by poor training, by poor operating methods and by low morale. It is not enough for the master tradesman or supervisor to know his work, - he must have the ability to pass along this knowledge to his subordinate workers or to his trainees in a manner that will enable them to comprehend his meaning and to develop their skills in the shortest possible time

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Having acquired the necessary skills after effective training, it is necessary that the work methods be well planned so that this skill will not be wasted. Finally, it is essential that the worker have the will to produce - that he have job interest - that motivation be supplied to him, by his superiors. The intent of the three programs, that are being launched in Germany as a result of this visit, is to supply each supervisor with a start in developing these skills.

NATURE OF "J" PROGRAMS

Each of the three programs is of ten hours duration. They have been given to over two million supervisors in every phase of American industry. They are now being given in Canada, Great Britain, The Netherlands, Belgium, France, and the Scandinavian countries. They are not untried theories, they are proven - they are now more than theories - they are techniques - they are operating methods in themselves.

Job Instructor Training, the first program to be released, gives the supervisor a start in developing the skill to instruct. It teaches him how to make a training time table, it teaches him how to make job breakdowns and it supplies him with a four-step method of instruction. Job Relations Training provides the supervisor with a method of dealing with his people as individuals and it provides him with techniques that will enable him to a) prevent many personnel problems from ever arising and b) provide the will to work, to his people. A second technique supplied him through the media of this program will enable him to handle those personnel relations problems that do arise in a menner that will be fair and equitable to all concerned. Job Methods Training is the third ten-hour program which supplies the same supervisor with the ability to analyze every job and operation under his supervision and to develop methods of performing those jobs which will materially increase the productive capacity of each employee and at the same time make the work easier to do, thus relieving fatigue and strain, and, in turn, further improving morale.

THE "INSTITUTE" METHOD

These programs are propagated through the "Institute" method. Each of the programs is an entity unto itself and although they all have a bearing on one another, they are conducted separately and under no conditions should they be mixed. Ten carefully chosen men and women are selected to attend the Institute. The Institute takes a minimum of one week, a maximum of two weeks. During this period of the first week, each of the ten trainees are given the basic ten-hour course and the balance of their time is spent in a study of the manual and in practicing each part of the manual before the eyes of the Institute members and the Institute Conductor. If the members satisfactorily complete the first week of the Institute they are given provisional certification as ten-hour group trainers, and subsequently are quality controlled by the Institute Conductor

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are given the benefit of his coaching as they conduct the ten-hour group, and if found capable, are given final certification. (This certification may be withdrawn for cause). Upon certification, the trainers are empowered to conduct ten-hour groups. These groups are attended by supervisors. All of these supervisors can be from one organization or they can be held at a central location and can be drawn from as many as ten organizations. These are the people who ultimately use the training-on-the-job. These programs are aimed at all levels of supervision.

PREPARATIONS FOR PROJECT

Upon arriving in Berlin in the first week of August, the author made immediate preparations for the translation of the Job Instructor Training manual into German. We are aware of the fact that many such translations had been made in various posts in the Western Zone by Americans who had received this training in the Army. We were also certain, from our Army experience, that these translations were frequently made by individuals who took liberties with the basic course and, as a result, in most cases weakened its effectiveness. This later proved to be the case and the time spent in our first translation was well spent.

While the translation was being made, the author and Mr. Leo Werts laid out a plan of action that would enable us to accomplish our primary goal in ninety days. This first goal was to be the selection, development and certification of a number of Germans, adequate to start the Job Instructor Training program in Germany.

The second week, therefore, found us in Frankfurt with Mr. Snyder of the BICO Manpower Group, and it found us facing the need for acquiring the services of an interpreter who would be more than that. This interpreter must have the kind of a background that would enable him to get the real meaning of the Job Instructor Training manual across to the trainees, without losing it through literal translations and interpretations which are so common. Again, Mr. Werts filled this gap with his recommendation of Mr. Rolf Shirm, a German national of Berlin. Mr. Shirm, it developed, had majored in Personnel Management, had been employed in the personnel department of a large manufacturing concern in Berlin, and had spent a year in a concentration camp because of the conflict between his views on Personnel Management and Nazi ideologies. Mr. Shirm had just completed the installation of one of the most progressive wage and job classification structures existent in any installation in Germany and equal to some of the best in the States, to quote the Director of Civilian Personnel in the office of the Secretary of the Army at Washington. To top of all this, Mr. Shirm was possessed of a knowledge of English that constantly amazed us; not only was he able to speak the language completely, to use the idioms with complete facility, - but was able to express himself in written English as effectively as those Americans fortunate enough to have received the best education. Mr. Shirm was of inestimable help to us and I want to use this vehicle to express my appreciation to him for his aid.

It might be said, in passing, once and for all, that the cooperation received from all Americans and Germans, in OMGUS, BICO, EUCOM, and the EES was a constant source of pleasure and amazement to the author and to Mr. Snyder. Without such cooperation as we received, not only in the four headquarters at Berlin, Frankfurt,

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Bad Nauheim and Heidelberg, but also at the Laender, it would have been impossible to have made the progress which we ultimately accomplished.

Following the selection of Mr. Shirm, Mr. Don Snyder of BICO, called upon the Manpower Officers in Stuttgart, Munich and Wiesbaden to arrange meetings in their respective areas, at which we would present an appreciation (a condensed version) of the program.

We requested that the following groups be represented by a representation of not less than two members each; Industrial Top Management, Trade Unions, The Labor Ministry and the Education Ministry. The meetings were to be two hours long.

In the middle of the second week, Stuttgart was the first stop and it was here that we encountered our first glimpse of the cooperation we were destined to receive. Mr. Edwin Beal, the Manpower Officer in Stuttgart, had selected a group of top representatives of each of the four organizations sending more than the two required. Top Management executives of such firms as Robert Bosch (Dr. Fischer) (electrical products) and Salamander (shoes) were present, and the representatives of the other organizations were of equal rank and ability.

The appreciation was presented by the author with Mr. Shirm's invaluable assistance acting in the capacity of interpreter. Following the appreciation, the audience were invited to pass comments or to ask any questions they had. The enthusiasm, or perhaps I should say, the interest (at that time) was so intense, that the question period ran another hour and a quarter and was brought to an end by our party solely because it was felt we were imposing upon the Stuttgart people.

PRESENTATION OF THE PROGRAMS

As a result of this meeting, we asked the representatives who were present to appoint a committee who would, in turn, select members from industrial plants, unions, or governmental agencies. These selectees would be sent to Oberursel, a small town near Frankfurt am Main, where they would participate in an institute that would run for two weeks. At the end of that time, if they had shown they were competent to conduct the basic ten-hour program in Job Instructor Training, they would be certified to return to their respective communities and conduct the basic course in factories, hospitals, railroads, or in any activity that would assist in the economic recovery of the nation. After they had conducted some of the basic ten-hour courses, they would be "quality-controlled" (observed) and if it was found that they were capable of doing so, they would be permitted to run additional institutes for the purpose of certifying additional trainers for the basic ten-hour course for their community.

The representatives of the various groups present readily acquiesced and subsequently selected the trainees who were later trained at Oberursel.

This same procedure was repeated at both Munich and Wiesbaden during the balance of the second and third weeks with the same results.

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There is no intention of gilding the lily in this report. These groups did not accept the program supinely without question. The doubts, however, were at what might be called an irreducible minimum, and there was a reason for this. It was realized at the outset that we would encounter many obstacles among the following:

1) The obstacle any foreigner inevitably encounters in attempting to sell his ideologies outside his native land - we had encountered these in other countries foreign to us in the past.

2) The conflict with long established German educational systems.

3) The conflict with the alleged German ideology of class.

4) The possible suspicion of labor unions (that this might be a new Bedeaux system, or some sort of speed-up plan).

5) The feeling that might exist that this was being forced upon Western Germany by Military Government.

6) The fear that this might spell doom to the much-vaunted European pride of craft - that this might, in other words, be a scheme to make automatons of craftsmen - doom them to an assembly line existence.

These were the fears and the questions that we considered in advance and as a result we spent the first twenty-five minutes of each appreciation in stating these fears ourselves, and in answering them. It may be of some interest to see how each of these was considered and answered.

1) We stated that we were aware of the fact that Germany had been subjected to many new ideas in the past two and a half years and that as a result we realized there might be resistance not only to our ideas but to us as individuals. We pleaded with each audience to keep an open mind, to ignore us as individuals, to examine our wares objectively and critically and not to lose some of the value of these ideas that might accrue to Germany by starting the conference with convictions already well established in their minds.

2) To the educators we explained that in the United States, also, at the outset of these programs, one of the most difficult barriers to surmount was the active opposition of professional educators. These individuals, in the beginning, looked upon industrial trainers as interlopers with a bag of tricks which they claimed were both a panacea for all our national industrial ills and also a condemnation of everything that had been done in the educational field for generations. We explained that these programs have an air of religion about them that develops a Messianic fervor in many of its disciples and these ardent "preachers" frequently

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aroused the ire of educators. We pointed out that today evidence of the complete acceptance of these programs by professional educators, is found in the fact that the programs are now under the direct supervision of the U. S. Office of Education in Washington.

3) To answer unexpressed criticisms based on German class distinctions, we said that we regarded this as pretty much of a myth - that we believed that Germans, too, felt that a man would do his best work when he was intelligently and fairly treated. As proof, we would ask our audience, if that were not so with them as individuals. Considerable time was spent on our actual handling of this objection. It is probably true that we relied in large part upon our sincere fervor and belief in these programs and attempted to impart this same feeling to our audience.

4) To labor, we recited the history of the programs in America. We explained that, in America, we had been most ill advised in that we had failed to make these programs available to labor until the war was half over. We gave them a chronological history of the programs and of labor's final contact with them, and of the complete acceptance by labor, and of labor's anger at having been left out from the start. We told German labor leaders that we had no intention of repeating this mistake and even though the programs were geared for the training of the supervisory level immediately above the worker level, we felt that labor had the right to know what we were attempting because they were as identified with the success and objective of the programs as were the men and women who would actually receive the training. We encouraged their questions and did not evade any of them.

In Stuttgart, for example, labor expressed the fear that if we intended to break jobs down into small pieces and have a man learn only one piece that he might then become weary of such a monotonous job. Also, we suspect, in the back of labor's mind was the fear that management would then pay less money for such a simple task. We explained that this program, by means of a training time-table (explained later in this text), made it possible for a supervisor to get a worker into production immediately by breaking the job down into small teachable units. But, we explained, that as soon as the worker had mastered the first unit, the supervisor, by means of his training time-table, would then schedule himself to teach the worker the next more difficult unit or the next chronological unit as the case might be. Over a period of time the worker would be taught the entire job but in the meantime he would be producing and it was agreed by everyone present at every meeting that the ONE thing that would solve the presently most pressing problems of Germany, was more production for export.

5) To answer the feeling that this was another mandatory proposition sponsored by the Occupation Forces, it was clearly explained and emphasized that the program was being presented on a "take it or leave it" basis, and that no compulsion was implied. In fact, it was stressed, that Military Government would look with favor

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upon anything that the German organizations might do to take over the programs, lock, stock and barrel, at the earliest possible moment, so that Military Government might withdraw from the picture. We were astonished to find a number of Germans who asked us to make certain that this did not happen. A number of industrialists and labor people, independently of one another, expressed the fear that without Military Government backing, the program might collapse. Many logical reasons were given for this fear, but following our instructions from Mr. Werts we made no promises on this score at the time.

6) We spoke of the fear that existed that these programs might spell doom to the European love of craftsmanship. If I may be permitted a personal observation, I would be inclined to remark that someone has sold America down the river throughout Europe on this one issue. Europeans seem to feel that everything is done in the United States by push buttons, that workers are figuratively chained to machines, that we have no real artisans, that our products are made to wear out quickly, that real quality is unknown in the United States. Two Americans in the short space of 90 days cannot change this erroneous concept of American Industry and unless it is changed by a mass presentation of facts, logic, motion pictures and examples of our craftsmanship, every disciple of advanced Personnel Management techniques who well is going to have a long, uphill fight on his hands. He will constantly face the cry, "That will work in America, but here in our country where we go in for high quality work, it won't succeed." Insofar as our audiences were concerned, we feel we successfully met this issue. Our approach was to pay tribute, sincerely, to the German apprenticeship system, which we have borrowed from, liberally, in the past. We did not present our program as a successor to their apprenticeship training. Rather, we presented it as repayment for the help we had received from their original training methods, and as a supplement to their apprenticeship training. We recognized the value of a long-range apprenticeship course, but we also pointed out the weaknesses of both German and old-time U. S. apprenticeship training. For example, the fact that much of the first year or two is wasted by the apprentice in such labor as carrying water and doing menial jobs for the "Meister" - jobs which add little to his fund of knowledge of the job, or to his skill. The excuse given for this waste of time is usually found in the cry, "It disciplines the boy." We ridiculed that, and to our pleasant surprise, found many of the Germans in vociferous agreement with us.

Upon our departure from Berlin, Mr. Werts had indicated his desire that we make the Institute training available to EUCOM if they chose to use it, and Mr. Barnett, Personnel Advisor to General Clay, had recommended that we make the same offer to the EUCOM Exchange System (PX Operation). Following the three meetings with Germans, we visited both of these organizations and again encountered the cooperation which by this time had become agreeably monotonous. EUCOM agreed to send two representatives, one Mr. Piet Beyerly (of whom, more later) of the Munich Military Post and Mr. Kurt von Frankenberg of headquarters in Heidelberg; both of these men were Germans, and very capable.

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The visit to the EES was almost too productive. We were invited to attend Col. Spaulding's staff meeting and at its conclusion we were given an opportunity to present our program. The interest of the Colonel and his staff extended this presentation into an hour session. At the conclusion of the discussion, we made it very clear that this was being offered on the usual "take it or leave it" basis. Colonel Spaulding's reply was, "We'll take it - how many people can you take from us - and when can we have a week of the time of your group for ourselves?" We had intended to limit the EES to three people and were prepared to stretch it, reluctantly, to five. The Colonel would have none of this and asked for, and ultimately received, eighteen seats, leaving us faced with the unprecedented task of running an Institute with 35 people - something never done in the United States or elsewhere.

Following this appreciation we returned to Berlin while Mr. Snyder completed arrangements for the Institute at Oberursel. The German labor unions had kindly made available to us their facilities at their school at Oberursel, a small town outside of Frankfurt am Main. The school was ideally suited to our purpose in that the students could be housed, fed and trained in the one building.

THE FIRST INSTITUTE

Much could be said about the Institute that would be of interest but we shall confine ourselves to the most significant events of the two weeks. The Institute opened with thirty-two members. Eighteen of these were from the EES. Two were from EUCOM organizations, ten were from German industry, and two from German labor organizations. At the end of the first day, Herr Karl Wittrock, Director of the Oberursel Trade Union School, who had sat in as an observer, asked permission to attend the balance of the Institute as a full-fledged member - and did so. This was a repetition of the same interest that had been manifested by American labor once they had an opportunity to be exposed to the program.

At the end of the first morning, Mr. Piet Beyerle of the Munich Military Post informed us that he had taken and given all three of these programs. After considerable discussion with Herr Beyerle it became apparent that he was a second "find" and on the third day, the Institute was divided into two groups. One group, from industry (and labor), was led by Herr Shirm and the second group, from the EES installations, was led by Herr Beyerle. The author would present each new section to the combined groups and then go from one group to another as they practiced their parts for Shirm and Beyerle. Because of the haste with which the EES section of the Institute had been assembled, we found, on the first day, a number of these people not quite clear as to the reason for their presence. This has not been unusual in the United States, and once we had ascertained the fact that there was some confusion on their part, we were quickly able to dispel it and in a very short time real interest began to develop on the part of the institute members. It is impossible to pay sufficient tribute to these people who

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came to Oberursel. They were away from their homes under trying conditions - all strangers to one another, with food rations which may have been sufficient but which were certainly not attractive; receiving training from the Occupation Forces, living under some degree of discipline (regarding curfew hours at night - imposed by the school authorities) - in spite of all of these and other similar conditions, a spirit rapidly developed within the group which made our contact with them the most pleasant we have ever enjoyed with any Institute group at any time.

As a result of this, and other, experiences, we are convinced that the hope of Germany lies in two groups - the young people and people of all ages in industry. Both of these groups, especially the former, are anxious to adopt the techniques that have made America great, and they are willing to adopt them if they are NOT fed to them as propaganda. We made it a cardinal rule throughout the institute, in spite of countless opportunities, to use nothing that might be regarded as even indirect propaganda for democracy. Asked countless questions about industry, American standards of living, and kindred subjects, our whole approach was to answer honestly by telling them of our bad conditions in America, our national faults, and by telling them also of the things about this nation that make it great. We were told on numerous occasions, by Germans, that this is new treatment - and admission that we do have some things wrong at home - and we would recommend this same approach to other consultants who may follow us.

During the course of the Institute, the group asked us if we would present an appreciation of the other two programs to them. At the end of the first week we presented them with an appreciation of Job Relations Training (Human Relations) and during the second week we took time to present them with an appreciation of Work Simplification (The Job Methods Training version). Each of these took from four to six hours, the longer period spent on JRT. At the end of the break for lunch and again at the end of the presentation of Job Relations Training, the group broke into spontaneous applause. Questioned as to the reason for this, we were told that this kind of thinking was a new religion - this was the first time they had been given the concept that all people must be treated as individuals, that you use reason and not emotion in handling personnel problems, that regardless of the person's salary or place in the organization, he was entitled to respect - "a restoration of human dignity." The words are theirs, not ours. I am completely convinced that the rapid propagation of the Job Relations Training Program throughout the European industrial world, its rapid incorporation into its schools, and its constant and continuous follow-up can do as much for the recovery of Europe as all the dollar bills we can pour in.

As further evidence of labor's interest is the fact that we were requested permission from Mr. Wittrock to invite the German labor leaders from Bavaria and Hesse to address the groups. Both of these gentlemen received a warm welcome from the entire group. Still further evidence of labor's support is found in the remarks made by members of the group who represented labor. After seeing the work simplification demonstration, two of them expressed themselves, very forcefully, as being in complete favor of the program; one remarking, "This is

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REAL codetermination - when Management recognizes the fact that the employee may have ideas that will help to make the business more successful with benefits to all," - the other remarking to the group, "Anyone who does not believe in THIS program is just crazy."

PROGRESS REPORT

Following the Institute, a trip was made to Berlin to report progress. At this time, the author and Mr. Werts made a visit to General Clay to report progress. After listening to a chronological accounting of all that had been done, and all that was still scheduled, General Clay asked Mr. Werts to arrange for a meeting on October 16th of all Post Commanders, Director of Personnel, Personnel Advisor to the Commander in Chief, Director of EES, and Commanding Generals of Supply Organizations and to extend an invitation to the British Command and to BICO Manpower representatives to attend. He further requested that a second meeting be held the same day at which German Labor Ministers from both Zones be invited to attend. The General expressed himself as being aware of the great good that could come from these programs and also aware of the fact that they could fail if it was not made abundantly clear that they were being supported at the top. He stated that he would open the meetings. (Subsequently it was decided that a joint meeting be held of British, American and German representatives listed above) and that the meetings then be divided into two sections - one German Ministerial Group, the other, an American Group which would take up the possibilities of developing the program among American installations employing German personnel.

FOLLOW-UP MEETINGS

Following this meeting Mr. Snyder and the author made a trip through the Zone, stopping at every installation (American) or German factory in which Oberursel trainees were employed. The only cities missed were Giessen, Wetzlar and Bremen. Meetings were once again held of the original committees in Stuttgart, Munich and Wiesbaden. The Oberursel trainees were also invited to these meetings as were their superior officers. The basic purpose of these follow-up meetings was to make certain that the trainees were given every opportunity to utilize their training. We wanted to make certain that their top executives realized what the training was for and realized the part that they had to play in the propagation of the program. Again, the Manpower field people made a real contribution.

At Schweinfurt, for example, executives of Kugelfischer (Ball Bearings) who had sent Herrn Bissinger to the Institute, called a meeting, upon our arrival, of the Oberburgermeister, top management of the chief industrial plants of the area, labor leaders and educational leaders of the community. Two hours were devoted to answering their many questions and in explaining the purpose of the programs to them. Executives of Kugelfischer reaffirmed. by inference, the early reports

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we had that it would be better if Military Government did not step out of the picture too soon. They stated that their main purpose in calling the meeting was to impress upon other leaders in the community the fact that these courses were not just an idea of their man Bissinger, but had a long history behind them and were important enough for Military Government to spend time on them.

A splendid job was done at Stuttgart, as usual. The Germans took charge of the meeting from the start, and for the first time one of the meetings called by Military Government (the meeting in Schweinfurt was called by Germans) was held in a German building - in the conference room of Robert Bosch. We were astounded to find some forty or fifty men present, top representatives of every major activity in the town, civic, governmental, organizational (Chamber of Commerce), educational and industrial. Dr. Heinz presided over the meeting and each group had a representative state the views of the group. Here, as in other cities, the ten-hour course was already under way with Herr Hiller of Bosch being the prime mover in this area.

THE BERCHTESGADEN MEETING

On our original tour of the Zone, a number of Americans, including Mr. Beal of Stuttgart, who was the pioneer in this matter, made the request that the concepts of the three programs be made available to Americans in the theatre if they were to be presented to Germans. After a number of these requests were made, especially by the Democratization Committee at Munich, it was agreed to hold a week-long meeting. Accordingly, such a meeting was held at the ski-lodge in Berchtesgaden early in October. Here were gathered twenty-five Americans representing OMGUS, EUCOM and the EES, and a British representative. For a full week, these people were given a thorough appreciation of the three basic courses as well as indoctrination in kindred subjects such as conference leadership, etc. The results of this meeting can best be summed up by the inclusion in this report of a letter drafted by this group. The letter follows:

Berchtesgaden
1 October 1948

MEMORANDUM TO MR. McCARTHY:

The several representatives from units of EUCOM, OMGUS and the Laender Military Government organizations, British Military Government, and EES who have had the opportunity of acquainting themselves with the three J programs during the past week under your direction unanimously believe that the program has great merit and recommend strongly its adoption widely throughout the American and British Zones of Germany.

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The program, if properly implemented, could play a very large part in the revival of German industry and the more efficient utilization of labor. The principles of Personnel Relations, based as they are on the appreciation of the worker as an individual and of his worth as a person, would be a valuable supplement to the reorientation of German thought toward democratic lines. It is readily apparent that many persons displaced from heavy industry and so-called white collar positions could much more easily be absorbed into the economy were these techniques of instruction and supervision adopted. In the interest of efficiency and, perhaps more important, the setting of example and establishing of American principles of correct employer-employee relationships, the various units of the United States Army, Military Government, European Exchange Service and the several supporting agencies of the European Command should be the first to adopt this program.

We expect to recommend to our own organizations that they give the program you have outlined their fullest support. We point out the desirability of gaining approval from the highest authorities and suggest, therefore, that since we cannot make direct representation to such authorities, that you take up directly with General Clay the question of implementing this program. We believe that this is especially important since you have already introduced these latest American techniques to the Germans for German industry at the Oberursel Institute, and we further believe that the Americans in Germany should not be behind the Germans in knowledge and application of these techniques. The reason for this is that American appreciation, understanding, and support will be necessary and effective toward following up the German lead and, further, that adaptation of these techniques can be made to good effect in carrying out our own occupation objectives, particularly reorientation.

It is impressive that only one American need be assigned at the top level in order to implement this program. It is gratifying to know that there are already available in this theatre at least two persons trained and certified for carrying out this work, one of whom might be detached from other duties and put in charge of implementation. We hope that you will be able to prevail on General Clay to take this most worthwhile step. We sincerely appreciate the opportunity to attend this course and thank you for the personal benefit it has brought to us.

CO-SPOKESMEN: /s/ R.S. Dollard
CCG (BE) College
Brunswick

/s/ William J. Moran
Field Operations Div.
CMG Bavaria

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The initial phase of the program was completed with the meeting held at Frankfurt on October 16th with General Clay presiding. While this meeting was all-important to the success of the program and merits more space than it receives here, its results can be portrayed in relatively few, but significant words.

General Clay made it very clear to the combined groups (American Military and German Ministerial) that he was whole-heartedly in favor of the programs and wanted them started at once. He further informed the German contingent that for them it was not mandatory but that he hoped they would see the value of the program and use it. We then presented to the American and German combined groups a very brief appreciation of the course. Following this appreciation, the Germans withdrew to a separate room where Herr Shirm, Mr. Snyder and Mr. Werts gave the German group further enlightenment on the objectives and the mechanics of the program. Concurrently we held, under the direction of Mr. Barnett of CINCEUR, a two-hour question and answer period for the American Military, and later in the day we again addressed the German group above.

Of considerable concern to the author was the fact that many Germans continually confused these programs with other programs conducted in Germany before the war. Actually nothing could be more incorrect. They bear no relation whatsoever to time study plans, wage incentive plans and similar programs that have a completely different goal and had different and, at times, reprehensible approaches to the problem of stimulating employee productivity. It is most essential that in the future conduct of this course in Germany that this issue be faced squarely and a complete explanation be made of the content and purpose of this kind of supervisory training. This is especially essential in view of the fact that these former speed-up systems quickly arouse the anger of labor and are regarded with a very dim view on the part of enlightened management.

CONCLUSION

At the conclusion of our stay in the Western Zones the program was gaining momentum. Such people as Dr. Buckner of Wiesbaden, Mr. Hiller of Stuttgart and many others were already running classes. The enthusiasm of the Oberursel people was at an all-time high. The program was in the competent and enthusiastic hands of Mr. Snyder and Herrn Shirm. Since my return a constant flow of unsolicited letters from the Germans is constant proof of their interest in the programs. I am sure that they share my faith in these programs as "Tools of Democracy". They recognize them as deeds, not words. As one German at Oberursel said after viewing an appreciation of the Personnel Relations Program, "We have learned more about democracy today in fifteen minutes than we have in three years of assorted preaching." We determined, upon questioning, that this was not intended as a rebuke to any branch of the Occupation Forces or of Military Government. Rather it was a general rebuke to individuals who have seen fit to try to sell Germany on democracy on the basis of the allegation that every industrial worker has a bath-tub, etc. etc. For the most part, our experiences in 1945 and again in 1948 indicate that the average German is more inclined to

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attribute the abundance of worldly goods enjoyed by America to our alleged richness in natural resources. These programs, especially Personnel Relations Training, seemed to be one of the few occasions when Germans have been exposed to techniques that they could see would result in greater productivity.

It is most important that one point be made very clear. It is not the intention of this report to make any claim that the three "J" courses are the entire warp and woof of executive training. Far from it, we consider them as the BASE of all other executive training. Needed badly in Germany today, if we are to realize the maximum potential of the labor now available, is a complete Management Development Program. This program must consist not only of Job Instructor Training, Job Relations Training, and Job Methods Training, but it must include sessions in conference leadership, employee performance evaluations, attitude building, safety training, budget and cost control, and some twenty-five or thirty other facets of Personnel Management. Badly needed is the development of "cafeteria training" - a complete library of training manuals for management development programs, so developed that the training department can select those courses which best fit the immediate needs of the installation or organization.

German management must be awakened to the great advantages of Employee-Employer Advisory Committees and of the advantages to be gained by a program of Management Development (Junior Executive Training). Only by this type of education can the demands for such things as co-determination be avoided. The average employee is crying out for the right to be heard as an individual, he seeks the opportunity to prove his worth as an individual to the company - deny him that right and he will obtain it by collective means - give it to him and it is possible to discover abilities that would otherwise remain hidden indefinitely, depriving the organization of the benefits to be derived from the great wealth of thinking power that is to be found among the rank and file of any organization - power that is used only when you motivate it through intelligent training and direction.

Since my return to the United States, many significant developments have occured in the conduct of this program in the Western Zone. Among them is the progressive step being taken to include these as mandatory subjects in the curriculae of Trade Schools and to make their completion a prerequisite to the granting of a Meister's certificate.

This report, therefore, will be complete only with a chapter by Mr. Snyder on the more recent developments, including the development of a greatly improved manual (from the standpoint of interpretation) by Mr. Shirm.

In closing the author feels it is most important to caution those, in whose hands the final destiny of these programs may be placed, against permitting any changes in the basic manual, in the methods of giving the course or in the

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methods of certifying and controlling the performance of trainers. Special vigilance should be exercized to control those individuals who feel that the German mores demand a different treatment. Our own experience has proven this is not true. Any surrender on this front will be a reflection on the German trainer and an indication that for some other reason he is not getting the message of these programs across to his group.

There is a ground swell in Germany for recognition of the individual - the life blood of these three programs is just that. To admit the false premise that the national character of the German will not support the theory of individual importance is a serious mistake. Millions of Germans have always desired this recognition of the individual but for the past century have been deprived of it by their leadership and a small but vocal and powerful minority who sought to perpetuate themselves by denying this individual freedom of thought. They deserve leadership at this time that will develop the importance of the individual and progressive Personnel Management techniques will do much to assist such leaders in establishing the kind of government and the ~~kind~~ of life in Germany that the world must have.

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SUBSEQUENT DEVELOPMENTS 1/

Following the completion of Mr. McCarthy's activity in Germany Mr. Don Snyder of the Bipartite Manpower Group and Mr. Shirm took over the direction of the Training-Within-Industry program, working closely with the nucleus of individuals trained at Oberursel. Mr. McCarthy had strongly emphasized two points before leaving for the States: The importance of maintaining close contact with the original group trained at Oberursel and the need for building a solid foundation for the program by maintaining quality control and refresher training. Periodic, informal progress reports have been issued from Frankfurt to the individuals in the Laender and individual contacts have been made by trips around the Zone. Refresher training was conducted in December at Stuttgart for those persons who were to hold Institutes during the month of January and ideas and techniques have been issued in the progress reports. In order to give the trainers a good JIT manual, Mr. Shirm retranslated the manual and an excellent printing job was done by CMGUS together with the printing of cards and other material which have been distributed to the Institute Conductors in the Laender.

The greatest progress on the program has been made by Land Wuerttemberg-Baden and it might be well to enlarge on the experience there inasmuch as it has become the model for the other Laender. The success of that area is due to the following factors: a) the establishment of a Kuratorium or Supervisory Council composed of the top officials from government, trade unions and industrial and trade organizations, b) the selection of Herr Hiller from industry and Herr Greiner of the Ministry of Education and Cultural Affairs (Kultusministerium) for the original training at Oberursel and c) the enlightened receptiveness of such persons as Dr. Fischer from industry, President Pflueger of the Land Trade Office (Landesgewerbeamt), Dr. Heinz of the Land Labor Office (Landesarbeitsamt), and Dr. Gloeckler of the Ministry of Education. For example, Dr. Fischer from industry and Dr. Gloeckler have made Herr Hiller and Herr Greiner available to the program on a full-time basis until it is well launched in that area.

The most outstanding achievement of Wuerttemberg and of great significance to the program in Western Germany was the decision of the Supervisory Council and the Ministry of Education to introduce the training into the vocational schools (Fach- und Berufsschulen). The Ministry of Education has decided to require all journeymen (Gesellen) to receive the training before they can be awarded their Meister certificates and all apprentices (Lehrlinge) must receive at least an appreciation demonstration of the program before they become journeymen. The program will thus become an accepted part of the vocational school training and marks an achievement that has not even been accomplished in the United States. As a result of this action, Land Hesse, which has also modeled

1/ Prepared by Mr. Don L. Snyder, Training Specialist, Bipartite Manpower Group.

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its Supervisory Council on the Wuerttemberg-Baden plan, will introduce the program in the Hesse vocational schools. In Bavaria the training is now being given as an accepted part of the curriculum of the Munich Adult Education Center (Muenchener Volkshochschule), the largest school of its kind in that Land.

The greatest difficulties that have been experienced since Mr. McCarthy's departure for the States have been organizational. At the time that the program was being introduced in the U. S. Zone, there existed no central labor department for the Bizonal Area. The Department for Manpower (Verwaltung fuer Arbeit) was just being set up at the time and, while it expressed the desire to sponsor the program for the entire Bizonal Area, it was not equipped with qualified personnel and an established organization to carry it out. However, the Department has now appointed a well-qualified individual in the person of Herr Dreyer, formerly of the Nuernberg Land Labor Office and one of the Oberursel trainees. He will carry out the necessary organizational work of establishing the program in all of the Laender of the Bizonal Area, assisted by Mr. Snyder and Mr. Shirm, and working closely with representatives of the trade unions and industrial management.

In conclusion it should be emphasized that at every meeting that has taken place with the Institute Conductors since Mr. McCarthy's departure and at every contact with government and industrial management representatives there has been the cry for more information, ideas and material on scientific personnel management. The "J" courses must be viewed as a foundation, as Mr. McCarthy points out, for a broad program which will introduce democratic personnel principles, methods and techniques on a planned basis. The demand is very strong. It is up to Military Government to deliver with the assistance of the British and U. S. Governments at home, our free institutions and such individuals as Mr. McCarthy.

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OCCUPIED AREAS OF GERMANY

KIEL
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SCHLESWIG-HOLSTEIN
HAMBURG
CCG HAMBURG
BREMERHAVEN
BREMEN
BREMEN
OMG BREMEN
BRITISH ZONE
LOWER SAXONY
HANOVER
CCG LOWER SAXONY
MINDEN
BRUNSWICK
BIELEFELD
NORTH RHINE
WESTPHALIA
ESSEN
US/UK COAL CONTROL GROUP
DUESSELDORF
CCG N. RHINE-WEST
COLOGNE
KASSEL
HESSE
COBLENZ
GM RHINELAND-PALATINATE
WIESBADEN
OMG HESSE
FRANKFURT
BIPARTITE CONTROL OFFICE
JEIA
FRENCH ZONE
RHINELAND-PALATINATE
SAAR
HEIDELBERG
HQ EUCOM
WUERTTEMBERG-BADEN
KARLSRUHE
STUTTGART
OMG WUERT.-BADEN
BADEN-BADEN
HQ, GMZFO
ULM
FRENCH ZONE
SOUTH WUERTTEMBERG BADEN
FREIBURG
GM SOUTH BADEN
RUSSIAN ZONE
MECKLENBURG
BRANDENBURG
BRITISH SECTOR
HQ CCG (BE)
BIPARTITE BOARD
BERLIN
ALLIED CONTROL
COORDINATING
ALLIED KOMMANDA
U.S. SECTOR
CINCEUR
HQ OMGUS
BIPARTITE BOARD
OMG BERLIN SECTOR
MAGDEBURG
SACHSEN-ANHALT
LEIPZIG
DRESDEN
THURINGIA
SAXONY
BAMBERG
NUREMBERG
MIL TRIB
OCCWC
US ZONE
REGENSBURG
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VOLUME I
MANUFACTURING INDUSTRIES

GENERAL HEADQUARTERS
SUPREME COMMANDER FOR THE ALLIED POWERS
ECONOMIC AND SCIENTIFIC SECTION
PROGRAMS AND STATISTICS DIVISION

AND

THE STATISTICS COMMITTEE
OF THE
JAPANESE GOVERNMENT

APRIL 1950

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DIVISION F - MANUFACTURING INDUSTRIES

THE DIVISION AS A WHOLE

The manufacturing division includes those establishments engaged in the mechanical or chemical transformation of inorganic or organic substances into new products and usually described as plants, factories, or mills, although home manufacturing is also included. These establishments characteristically use power-driven machines and materials handling equipment, but even if all the work is performed by hand, it is included in manufacturing. Establishments engaged in assembling component parts of manufactured products are also considered manufacturing if the new product is neither a structure nor other fixed improvement.

The materials processed by manufacturing establishments include products of agriculture, forestry, mining and quarrying. The final product of a manufacturing establishment may be "finished" in the sense that it is ready for utilization or consumption, or it may be "semi-finished" to become a raw material for an establishment engaged in further manufacturing. For example, the product of the copper smelter is the raw material used in electrolytic refineries; refined copper is the raw material used by copper-wire mills; and copper wire is the raw material used by certain electrical equipment manufacturers.

The materials used by manufacturing establishments may be purchased directly from producers, obtained through customary trade channels, or secured without recourse to the market by transferring the product from one establishment to another which is under the same ownership. Manufacturing is usually carried on for the wholesale market, for interplant transfer, or to order for industrial users, rather than for direct sale to domestic consumers.

Printing, publishing, and industries servicing the printing trades are classified as manufacturing industries.

The unit to be classified is the single establishment, which, in some cases may be a part of a larger organization composed of several establishments. In most cases, the industry assignment is determined on the basis of the principal product made in the establishment, but in a number of instances, indicated in the classification itself, other criteria are used.

Auxiliary units, such as power plants, laboratories, repair shops, garages, or warehouses, operated by a manufacturing establishment for its own use, are classified according to the primary activity of the manufacturing establishment. Central and district administrative offices are included with the manufacturing establishment when they are not primarily wholesale outlets.

There are borderline cases between the manufacturing division and the other divisions in the classification system. Specific instances will be found in the descriptions of the individual industries. A few of the more important examples are:

Agriculture

Processing on farms is not considered manufacturing if the raw materials are grown on the farm and if the manufacturing activities are on a small scale without the extensive use of paid labor. Other exclusions are custom grist milling, threshing, and cotton ginning.

Mining

The dressing and beneficiating of ores, and the breaking, washing, and grading of coal are not considered manufacturing.

Construction

Fabricating operations performed at the site of construction by contractors are not considered manufacturing, but the prefabrication of sheet metal, concrete and terrazo products and similar construction materials is included in the manufacturing division.

Wholesale and Retail Trade

Establishments engaged in the following types of operation are not included in the manufacturing division: Assembling, grading, and preparing fruits and vegetables for the market; pasteurizing and bottling milk; shelling & roasting nuts; cleaning, shucking and packing fresh clams, oysters and similar sea foods. Establishments producing principally for direct sale to household consumers are not included in the manufacturing division.

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DIVISION F - MANUFACTURING INDUSTRIES

THE DIVISION AS A WHOLE

The manufacturing division includes those establishments engaged in the mechanical or chemical transformation of inorganic or organic substances into new products and usually described as plants, factories, or mills, although home manufacturing is also included. These establishments characteristically use power-driven machines and materials handling equipment, but even if all the work is performed by hand, it is included in manufacturing. Establishments engaged in assembling component parts of manufactured products are also considered manufacturing if the new product is neither a structure nor other fixed improvement.

The materials processed by manufacturing establishments include products of agriculture, forestry, mining and quarrying. The final product of a manufacturing establishment may be "finished" in the sense that it is ready for utilization or consumption, or it may be "semi-finished" to become a raw material for an establishment engaged in further manufacturing. For example, the product of the copper smelter is the raw material used in electrolytic refineries; refined copper is the raw material used by copper-wire mills; and copper wire is the raw material used by certain electrical equipment manufacturers.

The materials used by manufacturing establishments may be purchased directly from producers, obtained through customary trade channels, or secured without recourse to the market by transferring the product from one establishment to another which is under the same ownership. Manufacturing is usually carried on for the wholesale market, for interplant transfer, or to order for industrial users, rather than for direct sale to domestic consumers.

Printing, publishing, and industries servicing the printing trades are classified as manufacturing industries.

The unit to be classified is the single establishment, which, in some cases may be a part of a larger organization composed of several establishments. In most cases, the industry assignment is determined on the basis of the principal product made in the establishment, but in a number of instances, indicated in the classification itself, other criteria are used.

Auxiliary units, such as power plants, laboratories, repair shops, garages, or warehouses, operated by a manufacturing establishment for its own use, are classified according to the primary activity of the manufacturing establishment. Central and district administrative offices are included with the manufacturing establishment when they are not primarily wholesale outlets.

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Transportation, Communication and Other Public Utilities.

Railroad repair shops are not included in the manufacturing division, while shops building and rebuilding locomotives and cars are included.

Services

In addition to certain of the service industries previously mentioned, a number of other repair trades, hand trades, and custom industries are not included in the manufacturing division. Examples of such establishments are power laundries; automobile, electrical, radio, jewelry, watch, furniture, upholstery, shoe and clothing repair shops; and blacksmith shops.

Major Group 20-FOOD AND KINDRED PRODUCTS

THE MAJOR GROUP AS A WHOLE

This major group includes establishments manufacturing foods and beverages for human consumption, and certain related products such as manufactured ice and prepared feeds for animals and fouls.

Group No.	Industry No.	
201		MEAT AND DAIRY PRODUCTS
	2011	Custom slaughtering
		Establishments primarily engaged in slaughtering cattle, hogs, sheep, horses, calves, and other animals on a contract basis for the trade. Hides and other by-products may be retained in partial payment for this service, and may be reported as the principal products of such establishments.
	2012	Sausages and other prepared meat products
		Establishments primarily engaged in manufacturing sausages, prepared meats (include canned meat), and meat specialties, but performing no slaughtering operations on the premises.
	2013	Dairy products
		Establishments primarily engaged in manufacturing creamery butter, natural cheese, condensed and evaporated milk, ice cream, and special dairy products such as processed and ladle butter, and processed cheese. Establishments which are primarily engaged in the pasteurization and distribution of fluid milk and cream are classified in trade.
202		SEA FOOD PRODUCTS
	2021	Canned seafoods and seaweed
		Establishments primarily engaged in cooking and canning fish, shrimps, oysters, clams, crabs, other sea foods, and seaweed. Establishments primarily engaged in shucking and packing fresh oysters in nonsealed containers are classified in trade.
	2022	Seaweed products except canned
		Establishments primarily engaged in manufacturing or processing seaweed products, laver products, etc.
	2023	Agar-agar and isinglass
		Establishments primarily engaged in manufacturing agar-agar and isinglass.
	2029	Cured and preserved seafoods, not elsewhere classified
		Establishments primarily engaged in smoking, salting, drying, quick freezing and other processing of fish or other seafoods, not elsewhere classified. Establishments primarily engaged in manufacturing seafood boiled down in soy are classified in this industry. Important products of this industry include dried bonito, salted or smoked salmon and trout, dried cod, smoked or dried herring, and various seafoods boiled down in soy.

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Group No.	Industry No.	
203		CANNED AND PRESERVED FRUITS AND VEGETABLES
	2031	Canned and preserved fruits and vegetables

Establishments primarily engaged in canning fruits and vegetables, and in manufacturing preserves, jams, and jellies. Establishments engaged in sun-drying or artificially dehydrating fruits and vegetables are classified in this industry. Important products of this industry include canned fruits (peach, pear, orange, etc.); canned vegetables (bean, allium bakeri, bamboo-shoot, etc.); preserves, jams, jellies; dried fruits and vegetables; pickled vegetables, etc.

204		SAUCES AND SEASONINGS
	2041	Bean paste ("miso")

Establishments primarily engaged in manufacturing bean paste ("miso").

	2042	Soy sauce ("shoyu")

Establishments primarily engaged in manufacturing soy sauce ("shoyu").

	2043	Edible amino acids

Establishments primarily engaged in manufacturing edible amino acids.

	2044	Glutamic acid soda

Establishments primarily engaged in manufacturing edible glutamic acid soda.

	2045	Spices and seasonings

Establishments primarily engaged in manufacturing spices and seasonings, such as curry-powder, mustard, pepper, etc.

	2046	Vinegar and other sauces (except "shoyu")

Establishments primarily engaged in manufacturing vinegar, vegetable sauces and seasonings, and salad dressings.

205		FLOUR AND GRAIN-MILL PRODUCTS
	2051	Rice and barley cleaning and polishing

Establishments primarily engaged in cleaning and polishing rice and barley. Important products of this industry include polished rice and barley, and rice bran.

	2052	Grain-flour mills

Establishments primarily engaged in milling flour or meal from grain. Important products of this industry include wheat flour; rye, buckwheat, corn and other flour; bran and middlings.

	2053	Potato-flour mills

Establishments primarily engaged in milling flour from dried potatoes. Establishments primarily engaged in manufacturing potato starch are classified in industry 2094.

	2054	Organic fertilizer and feeds

Establishments primarily engaged in manufacturing organic fertilizers and feeds.

206		SUGAR
	2061	Sugar

Establishments primarily engaged in manufacturing raw sugar and sirup from sugar cane, and in manufacturing sugar from sugar beets. Establishments primarily engaged in refining purchased raw sugar and processing purchased sugar sirup are also classified in this industry.

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Group No.	Industry No.	
207		BAKERY AND CONFECTIONERY PRODUCTS
	2071	Bread and other perishable bakery products Establishments primarily engaged in manufacturing bread, cakes, hand-made cookies, doughnuts, pies, pastries, and similar "perishable" bakery products. Establishments primarily engaged in producing "dry" bakery products such as biscuit, crackers, and pretzels are classified in industry 2072.
	2072	Biscuit, crackers and other dry bakery products Establishments primarily engaged in manufacturing biscuit (except raised biscuit), crackers, sponge goods, sweet goods, machine-made cookies, pretzels and similar "dry" bakery products. Establishments primarily engaged in producing "perishable" bakery products are classified in industry 2071.
	2073	Candy and confectionery products Establishments primarily engaged in manufacturing candy and confections, such as caramel candies, chocolate-covered confections, solid chocolate bars, chewing gum, etc. Establishments primarily engaged in manufacturing instant chocolate and cocoa from purchased chocolate and cocoa are classified in industry 2099.
208		BEVERAGE INDUSTRIES
	2081	Bottled soft drinks and carbonated water Establishments primarily engaged in manufacturing bottled soft drinks (non-alcoholic beverages), carbonated waters, and fruit juices and sirups for flavoring. Establishments primarily engaged in bottling natural spring waters are classified in trade.
	2082	Malt liquors Establishments primarily engaged in manufacturing all kinds of malt liquors, such as ale, beer, porter, stout, etc. Establishments primarily engaged in bottling purchased malt liquors are classified in trade.
	2083	Malt Establishments primarily engaged in manufacturing malt from rice or barley.
	2084	Wines (except "sake") Establishments primarily engaged in manufacturing wines, both dry and sweet. Establishments primarily engaged in bottling purchased wines, but which do not manufacture or blend wines, are classified in trade.
	2085	Distilled, rectified, and blended liquors Establishments primarily engaged in manufacturing alcoholic liquors by distillation and rectification, and in manufacturing cordials and alcoholic cocktails by blending processes, or by mixing liquors and other ingredients. Important products of this industry include grain alcohol (wine spirits), straight and blended whiskies, gin, and prepared alcoholic cocktails. Establishments primarily engaged in manufacturing industrial alcohol are classified in industry 2823, and those only bottling purchased liquors in trade.
	2086	"Sake" Establishments primarily engaged in manufacturing "sake". Important products of this industry include "sake" made from rice, synthetic "sake" ("sake" substitute), and "sake"-lees.
209		MISCELLANEOUS FOOD PREPARATIONS AND KINDRED PRODUCTS
	2091	Baking powder, yeast, and other leavening compounds Establishments primarily engaged in manufacturing baking powder, yeast, and other leavening compounds.

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Group No.	Industry No.	
	2092	Shortening and other cooking and edible fats and oils, not elsewhere classified

Establishments primarily engaged in manufacturing edible vegetable and compound shortenings, vegetable cooking oils, salad oils, oleo margarine, and other refined table oils not elsewhere classified, by further processing of purchased animal and vegetable oils. Establishments primarily engaged in extraction of vegetable and animal oils are classified in group 284.

2093 Tea

Establishments primarily engaged in processing tea.

2094 Starch

Establishments primarily engaged in manufacturing starch from potato or grain.

2095 Grape sugar

Establishments primarily engaged in manufacturing grape sugar from starch.

2096 Maltose

Establishments primarily engaged in manufacturing maltose.

2097 Manufactured ice

Establishments primarily engaged in manufacturing ice for sale. Establishments primarily engaged in manufacturing dry ice are classified in Industry 2816, and the harvesting and storage of natural ice are classified in trade.

2098 Noodles, macaroni and spaghetti

Establishments primarily engaged in manufacturing noodles, macaroni, spaghetti and other flour paste products.

2099 Food preparations, not elsewhere classified

Establishments primarily engaged in manufacturing prepared foods and miscellaneous food specialities not elsewhere classified, such as baked beans (not canned); eggs (dehydrated, desiccated, and canned); health foods; ice-cream cones and wafers; native preparations, etc.

Major Group 21-TOBACCO MANUFACTURES

THE MAJOR GROUP AS A WHOLE

This major group includes establishments engaged in manufacturing cigarettes, cigars, smoking and chewing tobacco and snuff, and in stemming and redrying tobacco. The manufacture of insecticides from tobacco by-products is included in Major Group 28.

211 CIGARETTES

2111 Cigarettes

Establishments primarily engaged in manufacturing cigarettes.

212 CIGARS

2121 Cigars

Establishments primarily engaged in manufacturing cigars.

213 TOBACCO (CHEWING AND SMOKING) AND SNUFF

2131 Tobacco (chewing and smoking) and snuff

Establishments primarily engaged in manufacturing tobacco (chewing and smoking) and snuff.

214 TOBACCO STEMMING AND REDRYING

2141 Tobacco stemming and redrying

Establishments primarily engaged in the stemming and redrying of tobacco.

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Major Group 22-TEXTILE MILL PRODUCTS

THE MAJOR GROUP AS A WHOLE

This major group includes establishments engaged in performing any of the following operations, regardless of the type of fiber used: (1) manufacturing yarn, thread, cordage and twine; (2) manufacturing woven fabric, carpets and rugs, braids, laces, knit fabric, knit garments, and other products from yarn; (3) dyeing and finishing fibers, yarn and fabric; and (4) coating, waterproofing and otherwise treating fabric.

Group No. | Industry No.

221 REELING, SCOURING AND COMBING PLANTS

2211 Silk reeling plants

Establishments primarily engaged in manufacturing silk filament, dupion and wild silk yarn from cocoons.

2212 Scouring and combing plants

Establishments primarily engaged in processing textile fibers to prepare them for spinning. Important processes included in this industry are wool scouring and carbonizing, and producing tops on worsted combs from wool, rayon or other synthetic fibers.

222 YARN AND THREAD MILLS

2221 Cotton and rayon staple spinning mills

Establishments primarily engaged in spinning, twisting, winding, or spooling yarn from cotton and rayon staple.

2222 Woolen and worsted spinning mills

Establishments primarily engaged in spinning, twisting, winding, or spooling yarn from wool, except carpet yarn.

2223 Silk staple spinning mills

Establishments primarily engaged in spinning, twisting, winding, or spooling yarn from waste silk fiber or cut silk staple.

2224 Hard and bast fiber spinning mills

Establishments primarily engaged in spinning, twisting, winding or spooling flax, hemp, ramie or jute. Establishments primarily engaged in manufacturing cordage and twine from hard and bast fiber are classified in Industry 2296.

2225 Recovered fiber spinning mills

Establishments primarily engaged in spinning, twisting, winding, or spooling yarn from recovered fiber.

2226 Spinning mills, not elsewhere classified

Establishments primarily engaged in spinning, twisting, or spooling yarn from fibers not elsewhere classified.

2227 Yarn throwing mills

Establishments primarily engaged in throwing or twisting filament yarn of silk, rayon or other synthetic fibers.

2228 Thread mills

Establishments primarily engaged in manufacturing thread of cotton, wool, silk, rayon or other synthetic fibers. Important products of this industry include sewing, crocheting, darning, embroidery, tatting, and handknitting threads.

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Group No.	Industry No.	
223		BROAD-WOVEN FABRIC MILLS (COTTON, WOOL, SILK, SYNTHETIC, HARD AND BAST, AND RECOVERED FIBER)
	2231	Broad-woven cotton and spun rayon fabric mills Establishments primarily engaged in weaving fabrics over 12 inches in width of cotton, spun rayon or other synthetic fibers.
	2232	Broad-woven silk and filament rayon fabric mills Establishments primarily engaged in weaving fabrics over 12 inches in width of silk or filament rayon yarn.
	2233	Broad-woven woolen and worsted fabric mills Establishments primarily engaged in weaving fabrics over 12 inches in width of woolen and worsted yarn.
	2234	Broad-woven hard and bast fiber fabric mills Establishments primarily engaged in weaving fabrics over 12 inches in width of linen, hemp, ramie or jute.
	2235	Broad-woven recovered fiber fabric mills Establishments primarily engaged in weaving fabrics over 12 inches in width of recovered fiber.
224		NARROW FABRICS AND OTHER SMALLWARES MILLS (COTTON, WOOL, SILK, SYNTHETIC, HARD AND BAST, AND RECOVERED FIBER).
	2241	Narrow fabrics and other smallwares mills (cotton, wool, silk, synthetic, hard and bast, and recovered fiber). Establishments primarily engaged in weaving or braiding fabrics 12 inches or narrower in width of cotton, wool, silk, rayon or other synthetic fibers, hard and bast, and recovered fiber. Establishments primarily engaged in weaving or braiding fabrics 12 inches or narrower in width of fabric-covered elastic yarn are also included in this industry. Important products of this industry include fabric belting, (mechanical and apparel), ribbons, tapes, bindings, and gimps; woven labels, hatbands, elastic and non-elastic webbing, rubber yarns and threads, and fabric lacings.
225		KNITTING MILLS
	2251	Full-fashioned hosiery mills Establishments primarily engaged in knitting, dyeing, or finishing full-fashioned hosiery.
	2252	Seamless-hosiery mills Establishments primarily engaged in knitting, dyeing, or finishing seamless (circular-knit) hosiery.
	2253	Knit outerwear mills Establishments primarily engaged in knitting outerwear, or in manufacturing outerwear from knit fabric produced in the same establishment. Important products of this industry include sweaters, bathing suits, dresses and headwear. Establishments primarily engaged in hand knitting outerwear for the trade are included in this industry. Establishments primarily engaged in manufacturing gloves and mittens are classified in Industry 2255, Group 238, or Group 315, and those manufacturing outerwear from purchased knit fabric in Major Group 23.
	2254	Knit underwear mills Establishments primarily engaged in knitting underwear and nightwear, or in manufacturing underwear and nightwear from knit fabric produced in the same establishment. Establishments primarily engaged in manufacturing underwear and nightwear from purchased knit fabric are classified in Major Group 23.

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Group No.	Industry No.	
	2255	Knit glove mills

Establishments primarily engaged in knitting or crocheting gloves and mittens, or in manufacturing gloves and mittens from knit fabric produced in the same establishment. Establishments primarily engaged in manufacturing gloves and mittens from purchased knit fabric are classified in Group 238.

2256 Knit-fabric mills

Establishments primarily engaged in knitting tubular or flat fabric (including warp-knit mosquito netting) and in dyeing or finishing knit fabric.

2259 Knitting mills, not elsewhere classified

Establishments primarily engaged in knitting articles not elsewhere classified, such as knit curtains, wash cloths, dish cloths and towels.

226 DYEING AND FINISHING TEXTILES (EXCEPT KNIT GOODS)

2261 Dyeing and finishing textiles (except woolen and worsted textiles and knit goods)

Establishments primarily engaged in bleaching, dyeing, printing, finishing; or otherwise converting fabrics, yarn, thread, or raw stocks, other than woolen and worsted. Establishments primarily engaged in dyeing or finishing knit goods are classified in Group 225, and woolen and worsted goods in Industry 2262.

2262 Dyeing and finishing woolen and worsted goods

Establishments primarily engaged in dyeing and finishing woven woolen or worsted fabrics or in dyeing wool, tops, or yarn.

227 CARPETS, RUGS, AND OTHER FLOOR COVERINGS

2271 Wool carpets, rugs, and carpet yarn

Establishments primarily engaged in weaving carpets and rugs wholly or in part of woolen or worsted yarn. This industry also includes establishments primarily engaged in spinning woolen or worsted yarn for use only in carpets and rugs.

2272 Carpets, rugs, and mats from fiber (except wool and straw)

Establishments primarily engaged in manufacturing rugs, carpets, art squares, floor mattings, and door mats and mattings from any fiber except wool (industry 2271), and tatami and other straw mats (industry 2274). Materials used include cotton, twisted paper, grasses, reeds, coir (cocoa-fiber), sisal, jute and rags.

2273 Linoleum, asphalted-felt-base, and other hard surface floor coverings, not elsewhere classified

Establishments primarily engaged in manufacturing linoleum, cork carpets, asphalted-felt-base, and other hard surface floor coverings, not elsewhere classified.

2274 "Tatami" or Japanese mats

Establishments primarily engaged in manufacturing mats from rush and straw.

228 HATS (EXCEPT CLOTH AND MILLINERY)

2281 Fur-felt hats and hat bodies

Establishments primarily engaged in manufacturing fur-felt hat bodies from hatters' fur, in manufacturing finished fur-felt hats from hat bodies produced in the same establishment and in manufacturing men's and boys' finished fur-felt hats from purchased hat bodies. Establishments primarily engaged in manufacturing millinery from purchased fur-felt hat bodies are classified in Group 235.

2282 Wool-felt hats and hat bodies

Establishments primarily engaged in manufacturing wool-felt hat bodies from raw wool and wool waste, in manufacturing wool felt hats from hat bodies produced in the same establishment, and manufacturing men's and boys' finished wool felt hats from purchased hat bodies. Establishments primarily engaged in manufacturing millinery from purchased wool-felt hat bodies are classified in Group 235.

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Group No.	Industry No.	
	2283	Straw hats

Establishments primarily engaged in manufacturing straw hat bodies, in manufacturing finished straw hats from hat bodies produced in the same establishment, and in manufacturing men's and boys' finished straw hats from purchased hat bodies. Establishments primarily engaged in manufacturing millinery from purchased straw hat bodies are classified in Group 235.

2284 Hatters' fur

Establishments primarily engaged in producing hatters' fur for use as material in manufacturing fur-felt bodies.

229 MISCELLANEOUS TEXTILE GOODS

2291 Felt goods (except woven felt and hats)

Establishments primarily engaged in manufacturing insulating and automotive felt, under-rug mats and other felt goods, from wool, hair and jute, by means of heat, moisture, and pressure, or by the needle-loom process. Establishments primarily engaged in manufacturing woven felt and haircloth are classified in 223, and those manufacturing felt hats in Group 228.

2292 Lace goods

Establishments primarily engaged in manufacturing lace-machine products such as levers laces, curtains, bedspreads, table covers, and Barmen lace. This industry also includes establishments primarily engaged in dyeing and finishing lace goods. Establishments primarily engaged in manufacturing machine embroideries are classified in Industry 239.

2293 Padding and upholstery filling

Establishments primarily engaged in manufacturing batting, padding, wadding, silk wadding, and upholstery filling from curled hair, cotton, moss, hemp tow, kapok, cocoon and related materials.

2294 Processed waste and recovered fibers

Establishments primarily engaged in processing textile mill waste for spinning and other uses, and in recovering cotton, wool, rayon, silk and other fibers from clippings and rags. Establishments primarily engaged in manufacturing oakum are also included in this industry.

2295 Artificial leather, oilcloth, and other impregnated and coated fabrics (except rubberized)

Establishments primarily engaged in manufacturing artificial leather, oilcloth, and other coated and impregnated fabrics, and in the special finishing of textiles such as the waxing of cloth and the varnishing of cambric and buckram.

2296 Cordage and twine (except straw)

Establishments primarily engaged in manufacturing rope, cable, cordage, twine and related goods, from hemp, jute, cotton, paper, flax, and other fibers.

2297 Straw goods (except "tatami" straw mats, hats and "zori")

Establishments primarily engaged in manufacturing straw goods such as straw rope and straw packing materials.

2299 Textile goods, not elsewhere classified

Establishments primarily engaged in manufacturing textile goods, not elsewhere classified.

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Major Group 23-APPAREL AND OTHER FINISHED PRODUCTS MADE FROM FABRICS AND SIMILAR MATERIALS

THE MAJOR GROUP AS A WHOLE

This major group, known as the cutting up and needle trades, includes establishments producing clothing and related fabricated products by cutting and sewing purchased woven or knit fabrics. All types of textiles are utilized, as well as leather, rubberized fabrics, fur or other materials. Custom tailors and dressmakers not operating on a factory basis are classified in nonmanufacturing industries.

Group No.	Industry No.	
231		MEN'S, YOUTHS' AND BOYS' SUITS, COATS AND OVERCOATS
	2311	Men's, youths' and boys' suits, coats and overcoats

Establishments primarily engaged in manufacturing men's, youths' and boys' suits, coats, overcoats, uniforms (policemen's, firemen's, etc.) and suit and coat findings. Suit and coat findings include coat fronts, interlinings, collar linings, trouser waistbands, and shoulder pads, and the making of buttonholes. Establishments primarily engaged in manufacturing men's work and sport garments are classified in Group 232.

232		MEN'S, YOUTHS' AND BOYS' FURNISHINGS, WORK CLOTHING, AND ALLIED GARMENTS (EXCEPT JAPANESE STYLE)
	2321	Men's, youths' and boys' furnishings, work clothing, and allied garments (except Japanese style)

Establishments primarily engaged in manufacturing the following garments: Men's, youths' and boys' shirts, collars, nightwear, underwear, neckties, scarfs, mufflers, hats and caps, separate trousers, overalls, work pants, industrial garments, washable service apparel, wash suits, oiled-fabric work garments, mackinaws, lumber jackets, work shirts, flannel shirts, blanket-lined coats, ski and snow suits, hunting and riding garments, and work, sport and other clothing, not elsewhere classified, which are cut and sewed from purchased woven or knit fabrics. Establishments primarily engaged in manufacturing hat and cap findings such as cap visors, sweatbands, and trimmings from purchased materials, and in tip printing or stamping are also included in this industry. Knitting mills primarily engaged in manufacturing any of the above mentioned garments are classified in Group 225. Establishments primarily engaged in manufacturing fur-felt hats, wool-felt hats, straw hats and hatters' fur are classified in Group 228, leather and sheep-lined garments in Group 238.

233		WOMEN'S AND MISSES' OUTERWEAR (EXCEPT JAPANESE STYLE)
	2331	Women's and misses' outerwear (except Japanese style)

Establishments primarily engaged in manufacturing women's and misses' garments which are cut and sewed from purchased woven or knit fabrics. Important products of this industry include blouses, waists, dresses (including ensemble dresses), household apparel chiefly of washable fabrics (such as aprons, smocks, hoovers, house dresses, and nurses' and maids' uniforms), suits, ensemble suits, skirts, coats other than fur, neckwear, scarfs, and all other women's and misses' outerwear such as bathing suits, beachwear, slacks, riding habits, and ski suits. Knitting mills primarily engaged in manufacturing outerwear are classified in Group 225.

234		WOMEN'S, MISSES', CHILDREN'S AND INFANTS' UNDER GARMENTS (EXCEPT JAPANESE STYLE)
	2341	Women's, misses', children's and infants' under garments (except Japanese style)

Establishments primarily engaged in manufacturing women's, misses', children's and infants' underwear and nightwear cut and sewed from purchased woven or knit fabrics, corsets and corset accessories, brassieres, girdles, foundation garments, and similiar body supporting garments. Knitting mills primarily engaged in manufacturing underwear and nightwear are classified in Group 225.

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Group No.	Industry No.	
235		MILLINERY
	2351	Millinery

Establishments primarily engaged in manufacturing women's, misses', children's, and infants' trimmed hats from felt or straw hat bodies and purchased millinery materials. Establishments primarily engaged in manufacturing fur-felt and wool felt hat bodies are classified in Group 228, and millinery braid and trimming in Group 239.

236		CHILDREN'S AND INFANTS' OUTERWEAR (EXCEPT JAPANESE STYLE)
	2361	Children's and infants' outerwear (except Japanese style)

Establishments primarily engaged in manufacturing children's and infants' dresses, coats, coat-and legging sets, snow suits, and all other outerwear such as house coats, middies, slacks, beach-wear, rompers, sun suits, play suits, bathrobes, and headwear, cut and sewed from purchased woven or knit fabrics. Knitting mills primarily engaged in manufacturing outerwear are classified in Group 225.

237		FUR GOODS
	2371	Fur goods

Establishments primarily engaged in manufacturing fur coats, and other garments, accessories, and trimmings made of fur. Establishments primarily engaged in manufacturing sheeplined clothing are classified in Group 238.

238		MISCELLANEOUS APPAREL AND ACCESSORIES (INCLUDING JAPANESE STYLE CLOTHING)
	2381	Miscellaneous apparel and accessories (including Japanese style clothing)

Establishments primarily engaged in manufacturing apparel and accessories not elsewhere classified. Important products of this industry include dress and semidress gloves and mittens, and work gloves and mittens, cut and sewed from purchased woven or knit fabric, or of these materials combined with leather; suspenders, arm bands, garters, hose supporters and related products; men's and women's bathrobes, lounging robes, and dressing gowns; raincoats from purchased rubberized fabrics and other waterproof outer garments made from such materials as pliofilm and cellophone; leather and sheep-lined garments; men's and women's apparel belts, regardless of materials; handkerchiefs; "tabi" or Japanese foot wear, "zori", men's, women's, children's and infants' Japanese "kimonos", and apparel, not elsewhere classified. Knitting mills primarily engaged in manufacturing gloves and mittens are classified in Group 225; corsets and allied garments in Group 234; oil fabric work garments in Group 232; and fur garments in Group 237.

239		MISCELLANEOUS FABRICATED TEXTILE PRODUCTS
	2391	Miscellaneous fabricated textile products

Establishments primarily engaged in manufacturing fabricated textile products, not elsewhere classified, from purchased fabric. Important products of this industry include curtains and draperies, sheets, pillow-cases, napkins, table cloths, "futon" (comforters), blankets, bedspreads, pillows, laundry bags, mops and dusters, slip covers, and other house furnishings; cotton burlap and other textile bags; awnings, tents, sails, canvas covers, tarpaulins; automobile seat covers, banners, flags, and pennants. Establishments primarily engaged in pleating, stitching and tucking for the trade; and in sponging or shrinking cloth for the trade; and in manufacturing trimmings for millinery and other uses; stamped art goods, and art needlework and embroideries are also included in this industry.

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Major Group 24-LUMBER AND WOOD PRODUCTS, EXCEPT FURNITURE

THE MAJOR GROUP AS A WHOLE

This major group includes saw mills, veneer mills, lath mills, shingle mills, cooperage stock mills, planing mills, plywood mills, etc. engaged in producing lumber and wood basic materials and establishments primarily engaged in manufacturing finished articles made entirely or mainly of wood or wood substitutes. Certain types of establishments producing wood products are classified elsewhere. For example, furniture and fixtures are classified in Major Group 25; pianos, musical instruments, toys and play ground equipment, and caskets and coffins in Major Group 39. Woodworking in connection with construction, in the nature of reconditioning and repair, or performed to individual order, is classified in nonmanufacturing industries.

Group No. | Industry No.

241 SAW MILLS AND PLANING MILLS

2411 Saw mills and planing mills, general

Establishments primarily engaged in sawing rough lumber and timber from logs and bolts, or re-sawing cants, flitches, or lumber into smaller dimensions; planing mills combined with saw mills; and separately operated planing mills which are engaged primarily in producing surfaced lumber and standard workings or patterns of lumber. This industry also includes establishments primarily engaged in sawing lath, railroad ties, and box shooks from logs or bolts and wood arms for telephone poles. Establishments primarily engaged in manufacturing box shooks or boxes from purchased lumber are classified in industry 2432 and sash doors, window and door frames, and other fabricated millwork from purchased lumber in Industry 2421.

2412 Veneer mills

Establishments primarily engaged in producing commercial veneer, either face or technical. Establishments primarily engaged in the production of veneer which is used in the same establishments for the manufacture of end products such as plywood are classified in Industry 2422, fruit and vegetable baskets in Industry 2431, and wooden boxes in Industry 2432.

2413 Shingle mills

Establishments primarily engaged in producing wood shingles including shake operations.

2414 Wooden shaving and chipping mills

Establishments primarily engaged in producing wood chipping, except shingle mills. Principal products of this industry include chipping boxes (for cake and rice, fruits and other food), and chipping for packing.

2415 Excelsior mills

Mills primarily engaged in manufacturing excelsior, wood wool, and excelsior pads and wrappers.

2416 Cooperage stock mills

Mills primarily engaged in producing cooperage barrel and tub stock, including staves, heading, and hoops for tight or slack cooperage whether produced by sawing or splitting.

2419 Special products sawmills, not elsewhere classified

Establishments primarily engaged in manufacturing special sawmill products not elsewhere classified. (Include "gasumaki").

242 MILLWORK, PLYWOOD, AND PREFABRICATED STRUCTURAL WOOD PRODUCTS

2421 Millwork plants

Establishments primarily engaged in manufacturing sash, windows, doors, window and door frames, blinds, mantels, panel work, porch work, stairways, and similar fabricated millwork from purchased lumber. Establishments primarily engaged in manufacturing prefabricated tanks and vats from purchased lumber are also included in this industry. Planing mills primarily engaged in producing millwork are included in this industry, but planing mills primarily producing standard workings or patterns of lumber are classified in Industry 2411.

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Group No.	Industry No.	
	2422	Plywood plants Establishments primarily engaged in manufacturing commercial plywood, including technical and industrial grades, from veneer produced in the same establishment or from purchased veneer.
	2423	Prefabricated wooden buildings and structural members Establishments primarily engaged in manufacturing prefabricated wooden buildings, or in producing laminated or fabricated trusses, arches, and other structural members of lumber.
243		WOODEN CONTAINERS
	2431	Bamboo, rattan, willow and veneer baskets Establishments primarily engaged in manufacturing articles of bamboo, rattan, veneer, reed, splint and willow, such as laundry hampers, clothes baskets, market baskets, fruit and vegetable baskets, and small articles such as trays, coasters, table pads, and willow bottle and demijohn covers. Establishments primarily engaged in manufacturing reed, rattan, bamboo and willow furniture are classified in Major Group 25.
	2432	Wooden boxes Establishments primarily engaged in manufacturing wooden boxes (nailed or wirebound, plain or fabric covered), crates, cases, wooden shipping drums, and carrier trays. Establishments primarily engaged in manufacturing box shooks and wooden trunk slats from purchased lumber are also included in this industry, but not establishments primarily engaged in manufacturing barrels.
	2433	Barrels, Japanese style, ("wadaru") Establishments primarily engaged in manufacturing barrels made from simple board and bound by bamboo, such as "miso" barrels ("misodaru"), "shoyu" barrels ("shoyudaru"), pickle barrels ("tsukemonodaru").
	2434	Barrels, foreign style, ("yodaru") Establishments primarily engaged in manufacturing barrels, made from bent board and bound by iron bands, such as nail barrels, beer barrels, chemical product barrels, petroleum barrels, etc.
	2435	Wooden tubs Establishments primarily engaged in manufacturing tubs made from simple board bound by bamboo or wire, such as manure tubs, wash tubs, bath tubs, etc.
244		FOOTWEAR, EXCEPT LEATHER AND RUBBER
	2441	Footwear, except leather and rubber Establishments primarily engaged in manufacturing Japanese wooden clogs ("geta") and Japanese sandals.
249		MISCELLANEOUS WOOD PRODUCTS
	2491	Wood preserving plants Establishments primarily engaged in treating wood (sawed or planed in other establishments) with creosote or other preservatives to prevent decay and to protect against fire and insects. Establishments primarily engaged in manufacturing wood products which they may also treat with preservatives are not included in this industry.
	2492	Lasts and related products Establishments primarily engaged in manufacturing lasts for boots and shoes, last sole patterns, shoe trees and stretchers, and display forms for boots and shoes, regardless of the material used.

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Group No. | Industry No.

2493 Mirror frames and picture frames

Establishments primarily engaged in manufacturing finished picture-frame moldings; in manufacturing frames for mirrors, pictures, photographs, and medallions and in framing pictures for the trade. Establishments primarily engaged in manufacturing mirror glass are classified in Major Group 32, and the framing of pictures to individual order is classified in nonmanufacturing industries.

2494 Bent work basic products

Establishments primarily engaged in manufacturing bent work of wood, such as the frames of sieves, clippers and steam kettles.

2499 Wood products, not elsewhere classified

Establishments primarily engaged in turning and shaping wood and manufacturing miscellaneous wood products, not elsewhere classified, such as wooden abacuses, bakers' wooden equipment, carvings, clothespins, cloth-winding reels, wooden dishes and other household and kitchen woodenware, flagpoles, wooden flooring, furniture turnings, wooden handles, shovel handles, garment hangers, ladders, letters, marquetry, oars, potato mashers, rolling pins, scaffolds, tailor's pressing blocks, toilet seats, tooth pick trays, inlaid veneer work, washboards (wooden and part wooden), wooden sieves, wooden shuttles, bowls, wooden moulds, wooden rice boxes, wooden spurs, and wooden spindles.

Major Group 25-FURNITURE AND FIXTURES

THE MAJOR GROUP AS A WHOLE

This major group includes establishments engaged in manufacturing household and office furniture, (including Japanese type and foreign type), religious furniture, sliding doors and screens ("Fusuma" and "Shoji"), window and door screens and shades, and bamboo shades, regardless of the materials used. Establishments primarily engaged in woodworking to individual order or reconditioning and repair are classified in nonmanufacturing industries.

251 FURNITURE, HOUSEHOLD AND OFFICE

Establishments primarily engaged in manufacturing furniture commonly used in dwellings and offices, whether padded, upholstered, or plain. This industry group also includes public-building and professional furniture, partitions, shelving, and lockers. Establishments primarily engaged in manufacturing religious furniture are classified in Industry 2521. Establishments primarily engaged in manufacturing stone and concrete furniture are not classified in this industry group.

2511 Furniture, Japanese type

Establishments primarily engaged in manufacturing Japanese style furniture ("wakagu") such as chests of drawers, mirror-stands and oblong chests.

2512 Furniture, foreign type (except metal)

Establishments primarily engaged in manufacturing foreign style furniture (except metal furniture, mattresses and bedsprings). Principal products of this industry include drawing-room and living-room furniture, wooden cabinets for radios, sewing machines; kitchen cabinets, camp furniture, nursery furniture, and smoking stands. This industry also includes establishments primarily engaged in manufacturing furniture for schools, assembly halls, churches, and libraries, and seats for public conveyances; and in manufacturing furniture especially designed for laboratory, hospital, and other professional uses, such as laboratory-work tables, and operating tables.

2513 Metal furniture

Establishments primarily engaged in manufacturing metal furniture, whether padded, upholstered, or plain.

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Group No.	Industry No.	
	2514	Mattresses and bedsprings

Establishments primarily engaged in manufacturing mattresses (including foam-rubber and boxsprings); assembled wire springs (fabric, coil, or box) for use on beds, couches, and cots; and spring cushions. Establishments primarily engaged in manufacturing individual wire springs are not classified in this industry.

252 RELIGIOUS FURNITURE

2521 Religious furniture

Establishments primarily engaged in manufacturing religious goods such as household Budhist altars and related articles, and Shinto altars.

259 MISCELLANEOUS FURNITURE AND FIXTURES

2591 Office and store fixtures

Establishments primarily engaged in manufacturing from wood, metal, or other materials, prefabricated partitions, shelving, cabinets, show and display cases, office and store fixtures, and related fabricated products including bar fixtures, lockers, display racks and stands, and store and lunchroom window-backs. Establishments primarily engaged in manufacturing refrigerated cabinets, show cases, display cases, and safes and vaults are not classified in this industry.

2592 Sliding doors and screens ("Fusuma" and "Shoji")

Establishments primarily engaged in manufacturing sliding doors and screens ("Fusuma" and "Shoji"). Establishments primarily engaged in manufacturing wooden sliding shutters ("Amado") and lattice doors are also classified in this industry.

2593 Window and door screens and shades

Establishments primarily engaged in manufacturing window and door screens (except wire screening), weather strips, complete window shades, window-shade rollers and fittings, and curtain rods, poles and fixtures regardless of the materials used. Establishments primarily engaged in manufacturing Venetian blinds, regardless of the materials used, are also classified in this industry.

2594 Japanese screens, clothes racks and bamboo shades

Establishments primarily engaged in manufacturing folding screens, single screens and ornamental clothes racks ("Byobu", "Tsuitate" and "Iko"). Bamboo shades ("Sudare") are also classified in this industry.

2599 Furniture and fixtures, not elsewhere classified

Establishments primarily engaged in manufacturing furniture and fixtures, not elsewhere classified.

Major Group 26-PAPER AND ALLIED PRODUCTS

THE MAJOR GROUP AS A WHOLE

This major group includes the manufacture of pulp primarily from wood and from rags and other fibers; the conversion of these pulps into any kind of paper or paperboard; and the manufacture of paper and paperboard into converted paper products. Certain types of converted paper products are classified elsewhere, such as paper textile, paper string and paper yarn in Major Group 22; abrasive paper in Major Group 32, carbon paper in Major Group 39, and photosensitized and blueprint paper in Major Group 28.

261 PULP, PAPER AND PAPERBOARD MILLS

2611 Pulp mills

Establishments primarily engaged in manufacturing pulp from wood or from other materials such as rags, linters, waste paper and straw. Logging camps operated by pulp mills, and not separately reported, are also included in this industry. Establishments primarily engaged in cutting pulp wood are classified in Industry 0631.

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Group No. | Industry No.

2612 Paper and paperboard mills (except building paper and building board mills)

Establishments primarily engaged in manufacturing paper and paperboard (except building paper and building board - Industry 2613) from wood pulp and other fibers, and which may also manufacture converted paper and paperboard products. Establishments primarily engaged in manufacturing converted paper and paperboard products from purchased paper stock are classified in Industry 2699. Pulp mills combined with paper and paperboard mills, not separately reported, are also included in this industry; when separately reported they are classified in Industry 2611.

2613 Building paper and building board mills

Establishments primarily engaged in manufacturing building paper and building board from wood pulp and other fibrous materials. Pulp mills combined with building paper and building board mills, and not separately reported, are also included in this industry; when separately reported they are classified in Industry 2611.

262 PAPER COATING AND GLAZING

2621 Paper coating and glazing

Establishments primarily engaged in manufacturing coated and glazed paper from purchased paper. Important products of this industry include coated-book, art, waxed, and gummed paper (including gummed labels, and paper and cloth tape), waterproofed wrapping paper, fly paper, oil paper (for medical use and for insulation), tarpaulin paper, tanned paper, stencil paper, etc.

263 PAPER BAGS AND ENVELOPES

2631 Paper bags and envelopes

Establishments primarily engaged in manufacturing paper bags and envelopes from purchased paper and similar materials. Important products of this industry include envelopes of any description, kraft paper bags for groceries, shipping or heavy-duty paper sacks for cement, flour or coal; glassine bags, cellophane bags and miscellaneous merchandise bags. Establishments primarily engaged in manufacturing papeteries (boxed stationery) are classified in Industry 2699.

264 PAPERBOARD CONTAINERS AND BOXES

2641 Paperboard boxes; folded, set up and corrugated

Establishments primarily engaged in manufacturing paperboard containers and boxes from purchased paperboard or fiber stock. Important products of this industry include folding paper boxes, set up boxes, corrugated and solid fiberboard boxes; decorated, lithographed, lacquered, and fancy covered paperboard boxes; cigarette boxes and confectionery boxes.

2642 Fiber cans, tubes, drums and similar products

Establishments primarily engaged in manufacturing fiber cans, cones, cores, mailing cases, ribbon blocks, spools, tubes, drums, and similar products with or without metal ends.

269 PULP GOODS AND MISCELLANEOUS CONVERTED PAPER PRODUCTS

2691 Wall paper and "Fusuma" (sliding door) paper

Establishments primarily engaged in manufacturing wall paper and "Fusuma" (sliding door) paper from purchased paper.

2699 Pulp goods and miscellaneous converted paper and paperboard products, not elsewhere classified

Establishments primarily engaged in manufacturing pulp goods and converted paper and paperboard products, not elsewhere classified, from purchased pulp, paper and paperboard.

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Major Group 27-PRINTING, PUBLISHING AND ALLIED INDUSTRIES

THE MAJOR GROUP AS A WHOLE

This major group includes establishments engaged in printing, publishing, and lithographing; and those performing services for the printing trades such as book-binding, typesetting, engraving, photo-engraving, and electrotyping. This group also includes publishers regardless of whether or not they do their own printing.

Group No.	Industry No.	
271		NEWSPAPERS
	2711	Newspapers

Establishments primarily engaged in publishing newspapers, or in publishing and printing newspapers. These establishments carry on the various operations necessary for issuing newspapers, including the gathering of news, and the preparation of editorials and advertisements, but may or may not perform their own printing. Job printing is frequently carried on by establishments engaged in publishing and printing newspapers, but even though the job printing may be of major importance such establishments are included in this industry. Establishments not engaged in publishing newspapers but which print or lithograph newspapers for publishers are classified in Industry 2741.

272		BOOKS AND PERIODICALS
	2721	Books and periodicals

Establishments primarily engaged in publishing only, or in publishing and printing books, pamphlets and periodicals. These establishments carry on the various operations necessary for issuing books, pamphlets and periodicals, but may not perform their own printing. Establishments not engaged in publishing books, pamphlets or periodicals, but which print or lithograph books, pamphlets or periodicals for publishers are classified in Industry 2741.

273		MISCELLANEOUS PUBLISHING
	2731	Miscellaneous publishing

Establishments primarily engaged in publishing such products as maps, atlases, sheet music, and directories, or engaged in miscellaneous publishing activities, not elsewhere classified, whether or not engaged in printing. Establishment primarily engaged in printing such products and not engaged in publishing are classified in Industry 2741. Establishments primarily engaged in offering financial, credit, or other business services and which may publish directories as part of this service are not included in this industry but are classified in nonmanufacturing industries.

274		COMMERCIAL PRINTING AND LITHOGRAPHING
	2741	Commercial printing and lithographing

Establishments primarily engaged in commercial or job printing and in preparing lithographic stones or other media and in printing from such media. Commercial printing includes general printing shops as well as shops specializing in printing newspapers, periodicals, books or pamphlets for others and those which specialize in gravure, rotogravure, and rotary photogravure printing. The greater part of the work in lithographing is performed on a job or custom basis, but in some cases lithographed calenders, commercial forms, maps, posters, etc., are made for sale. Offset printing, photo offset printing and photo lithographing are also included in this industry.

275		BOOK-BINDING AND RELATED INDUSTRIES
	2751	Book-binding

Establishments primarily engaged in book-binding. Book-binding done in book manufacturing establishments is classified in Group 272.

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Group No.	Industry No.	
	2752	Blankbook making and paper ruling

Establishments primarily engaged in manufacturing blankbooks such as ledgers, account books, and composition books, receipt pads, check books, inventory and similar blank books, and in ruling paper.

2753 Miscellaneous work related to book-binding

Establishments primarily engaged in book or paper bronzing, gilding and edging, in map and sample mounting and other services related to bookbinding.

279 SERVICE INDUSTRIES FOR THE PRINTING TRADE

2791 Typesetting

Establishments primarily engaged in machine and hand typesetting for the trade.

2792 Engraving and plate printing

Establishments primarily engaged in engraving and etching steel and copper plates; in using those plates to print security certificates, maps, etc., and in making wood-cuts for use in printing illustrations, posters, etc. Engraving for purposes other than printing is classified in Major Group 34.

2793 Photoengraving and electrotyping

Establishments primarily engaged in preparing photo engraved plates (halftones and line-cuts) and electrotype plates. These establishments do not, as a rule, print from the plates which they make but prepare them for use by others.

2794 Stereotyping

Establishments primarily engaged in preparing stereotype plates. These establishments do not as a rule print from the plates which they make, but prepare them for use by others.

Major Group 28-CHEMICAL AND RELATED INDUSTRIES

THE MAJOR GROUP AS A WHOLE

This major group includes establishments the manufacturing processes of which are characterized by changes in matter by means of chemical reaction, distillation, dissolution with or without subsequent evaporation and crystallization, including the mixing, compounding or otherwise finishing of the chemicals so obtained. Establishments primarily engaged in manufacturing the following products are not included in this industry but are classified in other major groups: Foodstuffs, ceramic products and metals such as iron, copper, zinc, cadmium, mercury, tin, lead, antimony, chromium, molybdenum, tungsten, manganese, nickel, cobalt, gold, silver, platinum and platinoids, aluminium, magnesium and their alloys. Sulphur-distillation is classified in mining. Establishments primarily engaged in packaging, repackaging and bottling of purchased chemical products, but not engaged in manufacturing chemicals and allied products, are classified in trade. Establishments primarily engaged in burning of lime and dolomite are classified in Major Group 32.

281 INDUSTRIAL INORGANIC CHEMICALS

This group includes establishments primarily engaged in manufacturing basic industrial chemicals, that is, chemicals which as a rule form raw materials for other industries and, therefore, are only of so-called industrial purity. Pure chemicals for scientific, analytical and pharmaceutical purposes are classified in Industry 2873, inorganic insecticides in Industry 2891.

2811 Ammonium sulphate industry

Establishments primarily engaged in the manufacture of ammonia and its most common compounds and derivatives such as sulphate, nitrate and nitric acid. Establishments primarily engaged in manufacturing ammoniated fertilizer are classified in Industry 2812.

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Group No. | Industry No.

2812 Superphosphate industry

Establishments primarily engaged in manufacturing superphosphate, treble-superphosphate and phosphoric acid produced by the wet process. Also included are establishments primarily engaged in manufacturing mixed and compounded fertilizers, and the production of sodium phosphate. The subsidiary making of sulphuric acid for consumption within the same establishment is also considered a part of the normal operation of the production of superphosphate. Establishments primarily engaged in manufacturing fused phosphates are classified in Industry 2814.

2813 Soda industry

Establishments primarily engaged in the manufacture of caustic soda, soda-ash, sodium-bicarbonate, hydrochloric acid, bleaching powder, and liquid chlorine. Establishments primarily engaged in manufacturing sodium compounds other than the above mentioned are classified in Industry 2819, salt in Industry 2817 and potassium compounds in Industry 2819.

2814 Electrothermic industry

Establishments primarily engaged in manufacturing calcium-carbide, calcium cyanamide, phosphorus and phosphoric acid, and artificial graphite by the electrothermic process. Establishments primarily engaged in the manufacture of silicon-carbide and alundum-grain are classified in Major Group 32.

2815 Inorganic pigment industry

Establishments primarily engaged in manufacturing inorganic coloring substances for use in paints, as fillers for paper and rubber, or as ceramic colors. Important products of this industry include black pigments such as soot-blacks and black iron oxide; white pigments such as zinc-white, white lead, lithopone, blanc fixe, titanium-pigments; color pigments such as ultramarine and vermilion; and chrome iron and other dry colors. Establishments primarily engaged in manufacturing organic pigments are classified in Industry 2822, artists' oil and water colors in Major Group 39.

2816 Compressed and liquefied gases

Establishments primarily engaged in manufacturing gases for sale in compressed, liquid and solid form such as oxygen, hydrogen, carbon dioxide (dry ice), acetylene, refrigerator gases, nitrogen, neon and argon. Establishments primarily engaged in manufacturing ammonia are classified in Industry 2811, and liquid chlorine in Industry 2813. Sulphur-dioxide is classified with the sulphuric acid plant of which it is a by-product.

2817 Salt

Establishments primarily engaged in manufacturing salt from natural or artificial brine including the finer processing into table salt.

2819 Industrial inorganic chemicals, not elsewhere classified

Establishments primarily engaged in manufacturing industrial inorganic chemicals not elsewhere classified. Important products in this group include inorganic acids such as boric, hydrofluoric and chromic acid; also sulphuric acid, if manufactured in an establishment not engaged in either the production of metals, ammonium sulphate, superphosphate, or inorganic pigments. Also included are the manufacture of inorganic salts of sodium, potassium, aluminium, calcium, chromium, magnesium, mercury, nickel, silver and tin, of inorganic compounds such as alums, sodium silicate, ammonium compounds, and of elemental bromine and iodine. Establishments primarily engaged in the manufacture of ammonium sulphate and nitrate are classified in Industry 2811, sodium phosphate in Industry 2812, sodium carbonate, bicarbonate, chlorate, hypochlorite, sulphide and "Leblanc" sulphate in Industry 2813. Establishments primarily engaged in manufacturing inorganic chemicals of "pro analysi" and pharmacy grade are classified in Industry 2873.

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Group No. | Industry No.

282 INDUSTRIAL ORGANIC CHEMICALS

This group includes establishments primarily engaged in manufacturing industrial organic chemicals by synthesis, fermentation, extraction, distillation, or other chemical processes. Establishments primarily engaged in manufacturing drugs and medicines are classified in Group 287, synthetic fibers in Group 283, soap, glycerin and other oil and fat products in Group 285, wood distillation and camphor products in Group 286, organic insecticides and fungicides in Industry 2891, perfumes and cosmetics in Industry 2893, and paints in Industry 2881.

2821 Coal-tar crude products

Establishments primarily engaged in manufacturing crudes from coal-tar. Such crudes include (1) light oils and light-oil products such as benzene and toluene; (2) coal-tar acids such as cresols and cresylic acid; and (3) products of medium and heavy oils such as creosote oil, naphthalene, anthracene, and their higher homologues, and tar. Establishments primarily engaged in manufacturing coal-tar crudes in by-product coke ovens are classified in Major Group 29, and petroleum refineries which produce such products are also included in Major Group 29.

2822 Intermediates, dyestuffs, lakes, and toners

Establishments primarily engaged in manufacturing cyclic intermediates, dyes, color lakes, and toners. Important products of this industry include (1) derivatives of benzene, toluene, phenol, aniline, nitrobenzene, and other cyclic intermediates; (2) classified and unclassified dyes such as azo and anthraquinone, and food, drug, and cosmetic dyes; and (3) lakes and extended colors and toners. Establishments primarily engaged in manufacturing inorganic color pigments are classified in Industry 2815, and natural dyeing materials in Industry 2862.

2823 Fermentation industry

Establishments primarily engaged in manufacturing industrial ethyl alcohol, methanol, butanol, and acetic acid. Distilleries engaged in manufacturing alcohol for beverage purposes are classified in Major Group 20.

2824 Acetylene and ethylene derivatives, methanol and its derivatives

Establishments primarily engaged in manufacturing(1) acetylene and ethylene derivatives such as acetaldehyde, acetic acid, acetone, butanol, ethylene chlorhyd.ine, ethylene oxide, ethylene glycol, chlorethylene, and dichlorethane; (2) methanol and its derivatives such as formalin, methyl chloride, methylene chloride; and (3) formic acid, oxalic acid and urea.

2825 Synthetic resins and plastics materials

Establishments primarily engaged in manufacturing plastics materials in the form of sheets, rods, tubes, granules, powders or liquids for use in further manufacturing. Important products of this industry include (1) condensation plastics such as alkyd, phenolic, and urea resins; (2) polymerization plastics, except synthetic fibers, such as polyvinyl alcohol, ester, halide, and copolymer resins; polyhexamethylenediamine adipamide resins; (3) protein plastics such as casein and soy-bean; (4) cellulose plastics, and regenerated cellulose sheets; and (5) synthetic elastomers such as plasticized polyvinyl alcohol, polyvinyl chloride, polyisobutylene elastomers and other similar products. Establishments primarily engaged in manufacturing rayon and other synthetic fibers are classified in Group 283, artificial leather in Major Group 22 and sensitized photograph film in Industry 2895.

2826 Industrial explosives

Establishments primarily engaged in manufacturing explosives and ammunition such as black powder, ammonium nitrate explosives, ammonium dynamite, gelatine dynamite, safety fuses, blasting and detonating caps.

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Group No.	Industry No.	
	2829	Industrial organic chemicals, not elsewhere classified

Establishments primarily engaged in manufacturing industrial organic chemicals, not elsewhere classified. Important products of this industry include noncyclic organic chemicals such as (1) organic acids, such as tartaric, citric acids, and their metallic salts; (2) solvents such as amyl alcohol, ethyl ether, and acetic ester; (3) plasticizers such as butyl phthalate, phenyl phosphate and cyclohexanone; (4) synthetic flavoring materials such as saccharin and dulcin; (5) rubber chemicals, such as accelerators and anti-oxidants and (6) synthetic tanning materials. Establishments primarily engaged in manufacturing coal-tar crudes are classified in Industry 2821, acetylene, ethylene derivatives and methanol and its derivatives in Industry 2824, intermediates, dyestuffs, lakes, toners in Industry 2822, synthetic resins and plastic materials in Industry 2825, industrial ethyl alcohol, methanol, butanol, and acetic acid in Industry 2823, organic medicinal chemicals in Group 287, soap, glycerin and fatty acids in Group 285, essential oils in Industry 2892, perfumes and cosmetics in Industry 2893, and gum and wood chemicals in Group 286.

283 SYNTHETIC FIBERS

2831 Rayon and other cellulose fibers

Establishments primarily engaged in manufacturing rayon, and other cellulose fibers to be used as materials for further manufacturing. Important products of this industry include fibers such as viscose rayon, acetate, and copper ammonia rayon. Textile mills primarily engaged in throwing, spinning, and weaving rayon, nylon, or other synthetic fibers are classified in Major Group 22.

2839 Synthetic fibers, not elsewhere classified

Establishments primarily engaged in manufacturing synthetic fibers except rayon and other cellulose fibers, to be used as material for further manufacturing. Textile mills primarily engaged in throwing, spinning or weaving such synthetic fibers are classified in Major Group 22.

284 VEGETABLE AND ANIMAL OILS AND FATS

This group includes establishments primarily engaged in extracting vegetable, marine, and animal oils and fats. Establishments primarily engaged in distilling and refining natural essential oils are classified in Industry 2892. Establishments primarily engaged in refining oil into edible cooking fats and oils are classified in Major Group 20, and those manufacturing fatty acids such as stearic acid and oleic acid in Industry 2851.

2841 Vegetable oils and fats

Establishments primarily engaged in manufacturing vegetable oils such as cotton seed oil, soybean oil, linseed oil, tung oil, castor oil, and by-product cake and meal. Establishments primarily engaged in refining vegetable oils into edible cooking oils and fats are classified in Major Group 20, and those refining these oils for medicinal purposes in Industry 2872.

2842 Animal oils and fats

Establishments primarily engaged in manufacturing marine and animal oils and by-product meal, in rendering inedible grease and tallow from animal fats, bones, and meat scraps. Establishments primarily engaged in refining animal oils for medicinal purposes are classified in Industry 2873, and those manufacturing edible animal oils and fats such as lard in Major Group 20.

285 SOAP AND OTHER OIL AND FAT PRODUCTS

This group includes establishments primarily engaged in manufacturing soap and glycerin, fatty acids, hardened oils, cleaning and polishing preparations, sulfonated oils and assistants, and soluble oils from oils and fats.

2851 Fatty acids, hardened oils, glycerin

Establishments primarily engaged in manufacturing fatty acids, hardened oils and glycerin. Establishments primarily engaged in manufacturing soap are classified in Industry 2852.

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Group No. | Industry No.

2852 Soap

Establishments primarily engaged in manufacturing soap in any form (including shampoos and shaving creams). Establishments primarily engaged in manufacturing washing powders and compounds, but not engaged in manufacturing soap are classified in Industry 2854, and shampoos and shaving creams from purchased soap in Industry 2893.

2853 Sulfonated oils and assistants

Establishments primarily engaged in manufacturing oils for textile and other uses, such as sulfonated oils and fats, higher alcohol emulsions, and soluble oils and fats. Establishments primarily engaged in blending and compounding lubricating oils and greases are classified in Major Group 29.

2854 Cleaning and polishing preparations

Establishments primarily engaged in manufacturing cleansers, washing powders, and washing compounds, but which are not engaged in manufacturing soap. Establishments primarily engaged in manufacturing dry cleaning preparations; metal, automobile, stove, shoe, and other polishes; paint and varnish removers; waxes, stains, finishes and dressings for fabricated leather and other materials. Burnishing inks and related products are also included in this industry. Establishments primarily engaged in manufacturing soap are classified in Industry 2852, and sulfonated oils and assistants for the textile and leather industries in Industry 2853.

2855 Candles

Establishments primarily engaged in manufacturing candles from acids, or from mineral and animal waxes.

286 GUM AND WOOD CHEMICALS

This group includes establishments primarily engaged in manufacturing hardwood and softwood distillation products such as wood and gum naval stores, natural dyestuffs, natural tanning materials, and camphor and its allied products. Charcoal may be produced as a by-product of establishments classified in some of these industries, but charcoal kilns which do not recover distillation products are classified in the Forestry Division. Establishments primarily engaged in manufacturing synthetic tanning materials are classified in Industry 2829, synthetic dyes in Industry 2822, and synthetic organic chemicals in Group 282.

2861 Hardwood and softwood distillation

Establishments primarily engaged in the destructive distillation of hardwood, resulting in the production of pyroligneus acid or raw liquor, and by-product charcoal; and in softwood distillation, resulting in the production of wood naval stores, either by the steam-and-solvent process or by the destructive distillation process. Important products of softwood distillation include wood turpentine, wood rosin, pine oil, pitch, tar, tar oil, wood creosote, and by-product charcoal. Establishments primarily engaged in manufacturing charcoal from hardwood, softwood, and sawdust in charcoal kilns which do not recover the distillation products are classified in the Forestry Division. Establishments primarily engaged in manufacturing turpentine and rosin by distillation of pine gum are classified in Industry 2869.

2862 Natural tanning and dyeing materials

Establishments primarily engaged in manufacturing solid and liquid tanning extracts from wood, bark, and other vegetable materials or in manufacturing natural dyeing materials from wood, bark, and other vegetable and animal materials. Establishments primarily engaged in manufacturing synthetic tanning materials are classified in Industry 2829, and synthetic dyeing materials in Industry 2822.

2863 Camphor and allied products

Establishments primarily engaged in camphor wood distillation, resulting in the production of crude camphor and camphor oil. This industry includes establishments primarily engaged in manufacturing refined camphor and camphor oils such as white oil and red oil. Establishments primarily engaged in manufacturing further products are classified in Industry 2892 or Group 282.

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2869 Gum and wood chemicals, not elsewhere classified

Establishments primarily engaged in manufacturing turpentine and rosin by the distillation of pine gum, and other gum and wood chemicals not elsewhere classified including shellac and copal extraction and refining. Establishments primarily engaged in manufacturing turpentine and rosin by wood distillation are classified in Industry 2861 and those gathering pine gum in the Forestry Division.

287 DRUGS AND MEDICINES

This group includes establishments primarily engaged in manufacturing biologicals, inorganic and organic medicinal chemicals, and pharmaceutical preparations. This group also includes establishments primarily engaged in grading and grinding botanicals.

2871 Biological products

Establishments primarily engaged in the production of viruses, serums, toxins, and analogous products such as allergenic extracts, and normal serums and plasmas for human or veterinary use. Establishments primarily engaged in manufacturing bacteriological media are also included in this industry.

2872 Botanical products

Establishments primarily engaged in grading, grinding, and milling botanical drugs and herbs. Establishments primarily engaged in manufacturing agar-agar are classified in Industry 2023.

2873 Inorganic and organic medicinal chemicals

Establishments primarily engaged in manufacturing bulk organic and inorganic medicinal chemicals and their derivatives. Establishments primarily engaged in manufacturing endocrine products, manufacturing or isolating basic vitamins, and isolating active medicinal principles such as alkaloids from botanical drugs and herbs are also included in this industry.

2874 Pharmaceutical preparations

Establishments primarily engaged in fabricating drugs and medicines in pharmaceutical preparations such as ampuls, tablets, capsules, ointments, solutions and suspensions, for human and veterinary use, including vitamin preparations and galenicals such as fluid extracts and tinctures. Products of this industry consist of two important lines: (a) pharmaceutical preparations promoted primarily to the dental, medical or veterinary professions and (b) pharmaceutical preparations promoted primarily to the public.

288 PAINTS, VARNISHES AND LACQUERS: AND PRINTING INK

2881 Paints, varnishes, lacquers, Japans and enamels

Establishments primarily engaged in manufacturing paints, varnishes (including insulating varnishes), enamels, lacquers, putty, shellac, Japans, and other coating materials. Important products of this industry include water paints and calcimines (dry and paste); paints in paste form (white or red lead in oil, zinc oxide in oil, colors in oil or Japan); ready mixed and semi-paste paints (paints in oil, undercoating and primer, wall paints, stains, and bituminous paints); varnishes and varnish stains; clear and lacquer enamels; enamels, Japans, putty and shellac. Establishments primarily engaged in manufacturing plastics materials are classified in Industry 2825, artist's oil and water colors in Major Group 39, organic color pigments in Industry 2822, inorganic extenders such as blanc fix in Industry 2815, inorganic pigments in Industry 2815 and whiting from limestone or chalk in Major Group 32.

2882 Printing ink

Establishments primarily engaged in manufacturing printing ink, gold and bronze ink, and lithographic ink.

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Group No.	Industry No.	
289		MISCELLANEOUS CHEMICALS
	2891	Insecticides and fungicides.

Establishments primarily engaged in manufacturing inorganic insecticides such as copper sulfate, calcium arsenate, lead arsenate, nicotine sulfate, lime sulfur solution, and soda mixture; organic insecticides such as pyrethrum emulsion, miscellaneous insecticides such as D.D.T. and its emulsions; and fungicides such as sulfur and mercury containing fungicides. Establishments primarily engaged in manufacturing household insecticides are classified in 2899.

2892 Essential oils

Establishments primarily engaged in distilling, expressing and refining natural essential oils.

2893 Perfumes, cosmetics and other toilet preparations

Establishments primarily engaged in manufacturing natural perfume, synthetic perfume, cosmetics and other toilet preparations such as toilet water, face powder, lipstick, personal deodorants, washes and lotions; hair dyes, tonics, and dressings; bath salts, manicure preparations, tooth paste, and tooth powder. This industry also includes establishments primarily engaged in blending and compounding perfume bases. Establishments primarily engaged in manufacturing soap are classified in Industry 2852.

2894 Glue and gelatin

Establishments primarily engaged in manufacturing (1) glue from vegetable or animal materials and (2) edible, technical, photographic, or pharmaceutical gelatine from animal materials. Establishments primarily engaged in manufacturing dessert preparations with gelatine base are classified in Industry 2099, and agar-agar in Industry 2023.

2895 Sensitized photographic materials

Establishments primarily engaged in manufacturing sensitized photographic films, papers and plates.

2899 Miscellaneous chemical products, not elsewhere classified

Establishments primarily engaged in manufacturing miscellaneous chemical products not elsewhere classified, such as bluing, laundry sours, mucilage, writing and stamp pad ink, and dextrine sizes; household disinfectants and deodorants; household insecticides and repellants such as fly sprays, rat, ant, and roach poisons and moth repellants; household adhesives and cements; and industrial compounds, such as boiler and insulating compounds, metal, oil, and water-treating compounds, water-proofing compounds, chemical supplies for foundries, and bone black, carbon black and lamp black.

Major Group 29-PRODUCTS OF PETROLEUM AND COAL

THE MAJOR GROUP AS A WHOLE

This major group includes establishments refining crude petroleum, and manufacturing coke and coke oven products, paving and roofing materials, and other products made from petroleum and coal. Refining of waste petroleum oil is also classified in this group. Establishments manufacturing and distributing gas to consumers are classified in public utilities.

291		PETROLEUM REFINING
	2911	Petroleum refining

Establishments primarily engaged in producing gasoline, illuminating oils, fuel oils, lubricants, and other products from crude petroleum and its fractionation products in petroleum refineries. Establishments primarily engaged in producing natural gasoline from natural gas are classified in mining, and in manufacturing lubricating oils and greases by blending and compounding purchased materials in Industry 2992. Refining of waste petroleum oil is classified in Industry 2993.

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Group No.	Industry No.	
292		COKE AND BY-PRODUCTS
	2921	Beehive coke ovens Establishments primarily engaged in producing coke in beehive ovens.
	2922	By-product coke ovens Establishments primarily engaged in manufacturing coke, coal gas, tar, and other products in "By-product" coke ovens.
293		PAVING AND ROOFING MATERIALS
	2931	Paving and roofing materials Establishments primarily engaged in manufacturing asphalt and tar paving mixtures, asphalt and other saturated roofing felt in roll or shingle form, either smooth or faced with grit. Establishments primarily engaged in manufacturing paint are classified in Industry 2881.
299		MISCELLANEOUS PRODUCTS OF PETROLEUM AND COAL
	2991	Fuel briquets and packaged fuel Establishments primarily engaged in manufacturing fuel briquets, boulets, and packaged fuel from anthracite culm, bituminous slack, charcoal, coke screenings, sawdust or other materials, usually mixed with tar or other binders, and in manufacturing powdered fuel.
	2992	Lubricating oils and greases not made in petroleum refineries Establishments primarily engaged in blending and compounding lubricating oils and greases from purchased materials. Petroleum refineries engaged in the production of lubricating oils and greases are classified in Industry 2911.
	2993	Reclaiming of waste petroleum oils Establishments primarily engaged in refining waste or dirty petroleum oils.
	2999	Products of petroleum and coal, not elsewhere classified Establishments primarily engaged in manufacturing products of petroleum and coal, not elsewhere classified.

Major Group 30-RUBBER PRODUCTS

THE MAJOR GROUP AS A WHOLE

This major group includes establishments manufacturing from natural or synthetic rubber, gutta-percha, balata, or gutta siak, all kinds of rubber products such as tires, rubber footwear, mechanical rubber goods, and rubber sundries. This group also includes establishments processing reclaimed rubber or rebuilding and retreading rubber tires. The manufacture of elastic webbing is classified in Major Group 22, products made from elastic webbing and garments made from rubberized fabrics in Major Group 23, and synthetic rubber in Major Group 28.

301		TIRES AND INNER TUBES
	3011	Tires and inner tubes Establishments primarily engaged in manufacturing pneumatic casings, inner tubes, and solid and cushion tires for all types of vehicles.
302		RUBBER FOOTWEAR
	3021	Rubber footwear Establishments primarily engaged in manufacturing all rubber footwear, waterproof fabric-upper footwear, and other fabric-upper footwear having rubber soles. Establishments primarily engaged in manufacturing rubber, composition, and fiber heels, soles, and related shoe making materials are classified in Industry 3099, and those manufacturing rubber soles of "zori" from tire and tube scrap in Industry 3041.

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Group No.	Industry No.	
303		RECLAIMED RUBBER
	3031	Reclaimed rubber

Establishments primarily engaged in reclaiming rubber from used tires, scrap, and miscellaneous waste rubber by manufacturing processes which result in a product that is sold for mixing with crude rubber and artificial rubber as an extender. Establishments primarily engaged in the assembly and wholesale sale of scrap rubber, but not engaged in manufacturing reclaimed rubber, are classified in trade.

304 SCRAP RUBBER PRODUCTS

3041 Scrap rubber products

Establishments primarily engaged in manufacturing scrap rubber products such as rubber soles of "zori" (Japanese sandals) from tire scrap and tube scrap. Establishments primarily engaged in manufacturing rubber products from reclaimed rubber are not classified in this industry.

305 WHOLESALE TIRE RETREADING PLANTS

3051 Wholesale tire retreading plants

Establishments primarily engaged in retreading tires for the trade, or for wholesale sale are included in this industry, but the rebuilding or retreading of rubber tires by repair shops is classified in service.

309 MISCELLANEOUS RUBBER PRODUCTS

3091 Industrial rubber belting and hose

Establishments primarily engaged in manufacturing industrial rubber belting and hose such as V-belting, transmission belting, conveyor and elevator belting, chemical hose, air hose, brewing hose, and oil hose.

3092 Tire and inner tube repair materials

Establishments primarily engaged in manufacturing tire and inner tube repair materials such as repair sheets, uncured cord patches, hot and cold tube patches, and other repair materials.

3093 Rubber coated cloth and its' products

Establishments primarily engaged in manufacturing rubberized fabrics and vulcanized rubber clothing such as rubberized sheeting, waterproof materials, fisherman's suits, rain coats, and diving dress. An establishment making clothing from purchased rubberized fabrics is classified in Industry 2381.

3099 Rubber products, not elsewhere classified

Establishments primarily engaged in manufacturing rubber products, not elsewhere classified, such as medical sundries, nursery equipment and rubber cement.

Major Group 31-LEATHER AND LEATHER PRODUCTS

THE MAJOR GROUP AS A WHOLE

This major group includes establishments engaged in tanning, currying and finishing hides and skins, and establishments manufacturing finished leather and artificial leather products and some similar products made of other materials.

311 LEATHER TANNING AND FINISHING

3111 Leather tanning and finishing

Establishments primarily engaged in tanning, currying and finishing sole and belting leathers, upper and lining leathers, and miscellaneous specialty leathers and in embossing, japanning and currying leather.

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Group No.	Industry No.	
312		INDUSTRIAL LEATHER BELTING AND PACKING
	3121	Industrial leather belting and packing

Establishments primarily engaged in manufacturing leather belting used for transmission of power, and leather packing.

313		BOOT AND SHOE CUT STOCK AND FINDINGS
	3131	Boot and shoe cut stock and findings

Establishments primarily engaged in manufacturing leather soles, and other shoe cut stock, and leather welting, shank, heel and toe caps, leather shoe laces, finished wood heels, and other boot and shoe findings.

314		LEATHER FOOTWEAR
	3141	Leather footwear

Establishments primarily engaged in manufacturing boots, shoes, sandals, overgaiters, etc, made chiefly of leather but to some extent of canvas and other textiles.

315		LEATHER GLOVES AND MITTENS
	3151	Leather gloves and mittens

Establishments primarily engaged in manufacturing leather gloves and mittens.

316		LUGGAGE
	3161	Luggage

Establishments primarily engaged in manufacturing suitcases, bags, trunks and related luggage of leather or other materials.

317		HANDBAGS AND SMALL LEATHER GOODS
	3171	Handbags and small leather goods

Establishments primarily engaged in manufacturing women's handbags and purses, of leather or other materials, and small leather articles such as billfolds, cigarette cases, etc.

319		MISCELLANEOUS LEATHER GOODS
	3191	Saddlery, harness and whips

Establishments primarily engaged in manufacturing saddles and parts, harness and parts, and whips.

	3199	Leather goods, not elsewhere classified

Establishments primarily engaged in manufacturing miscellaneous leather goods, not elsewhere classified, including dog collars and razor straps.

Major Group 32-STONE, CLAY, AND GLASS PRODUCTS

THE MAJOR GROUP AS A WHOLE

This major group includes establishments engaged in manufacturing flat glass and other glass products, cement, structural clay products, pottery, concrete and gypsum products, cut-stone products, abrasive and asbestos products, etc., from materials taken principally from the earth in the form of stone, clay and sand.

321		GLASS
	3211	Flat glass

Establishments primarily engaged in manufacturing flat glass, including plate glass, clear window glass, rolled glass, figured and wire glass, opalescent and obscured glass, spectacle glass, and cathedral and skylight glass. This industry also produces tempered and laminated glass, but establishments primarily engaged in manufacturing laminated glass from purchased flat glass are classified in Industry 3214.

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Group No. | Industry No.

3212 Glass containers

Establishments primarily engaged in manufacturing pressed or blown glass containers for commercial packing and bottling.

3213 Glass and glassware, cut, pressed or blown (except glass containers)

Establishments primarily engaged in manufacturing glass and glassware, cut, pressed or blown, not elsewhere classified. Important products of this industry include machine-made or hand-made glass tableware; glass blanks for electric light bulbs; light shades and reflectors, and other lighting glassware; glass tubing and other technical, scientific, and industrial pressed or blown glassware; glass cooking and oven ware; glass brick; and glass insulators. Establishments primarily engaged in the production of pressed lenses for spectacles, headlights, beacons, and lanterns are also included in this industry, but establishments primarily engaged in the production of optical lenses are classified in Industry 3851. Establishments primarily engaged in manufacturing glass containers are classified in Industry 3212, and complete electric light bulbs in Major Group 36.

3214 Glass products made of purchased glass

Establishments primarily engaged in manufacturing glass products from purchased glass, including laminated or safety glass, stained, leaded, ornamented, and decorated glass; mirrors; medicinal and scientific apparatus glass; glass novelties; mosaic glass; ground glass; cut, beveled, and etched glass; and glass watch crystals. Establishments primarily engaged in manufacturing optical and ophthalmic lenses are classified in Major Group 38.

3215 Optical glass

Establishments primarily engaged in manufacturing optical glass for sale as such.

3216 Glass fiber and its products

Establishments primarily engaged in manufacturing glass fiber or glass wool and their products, such as glass fiber cloth, tape and sleeve.

322 CEMENT, HYDRAULIC

3221 Cement, hydraulic

Establishments primarily engaged in manufacturing hydraulic cement, including portland and blast-furnace slag cements and cement substitutes.

323 STRUCTURAL CLAY PRODUCTS

3231 Clay roofing tile

Establishments primarily engaged in manufacturing clay roofing tile, including ornamental crests made of clay.

3232 Building brick

Establishments primarily engaged in manufacturing clay building brick and vitrified paving brick. Establishments primarily engaged in manufacturing firebrick are classified in Industry 3251, sand-lime brick in Industry 3239.

3233 Tile and mosaic, except quarry tile

Establishments primarily engaged in manufacturing ceramic tile, glazed and enameled tile, including faience and other types of ceramic floor and wall tile (except quarry tile).

3234 Clay pipe

Establishments primarily engaged in manufacturing sewer pipe and kindred products made of clay for agricultural and civil engineering use.

3239 Structural clay products, not elsewhere classified

Establishments primarily engaged in manufacturing structural clay products, not elsewhere classified, such as architectural terra cotta, stove lining, chimney pipes and tops, wall coping, and quarry or promenade tile. Sand-lime brick is also included in this industry.

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Group No.	Industry No.	
324		POTTERY AND RELATED PRODUCTS
	3241	Vitreous and semivitreous plumbing fixtures

Establishments primarily engaged in manufacturing vitreous and semivitreous plumbing fixtures and accessories. Important products of this industry include bathroom and toilet fixtures, closet bowls, flush tanks, lavatories and stalls, and accessories.

3242 Table and kitchen pottery

Establishments primarily engaged in manufacturing vitrious and semivitreous ceramic table and kitchen articles for use in households, in hotels, restaurants and other commercial institutions for preparing, serving, or storing food or drink. This industry also includes such fancy goods made of clay as figures, vases and lamp bases.

3243 Pottery decorating for the trade

Establishments primarily engaged in decorating plain pottery for the trade.

3244 Porcelain electrical supplies

Establishments primarily engaged in manufacturing porcelain electrical insulators, molded porcelain parts for electrical devices, spark plug and steatitic porcelain, and other electrical supplies from clay and other ceramic materials.

3245 Preparing pottery clay

Establishments primarily engaged in refining, grinding and preparing clay and other ceramic materials for use by pottery and kindred products manufacturers.

3249 Pottery products, not elsewhere classified

Establishments primarily engaged in manufacturing miscellaneous pottery, earthenware flower pots, and pyrometric cones and tubes.

325 REFRACTORIES, CLAY AND NON-CLAY

3251 Refractories, clay and non-clay

Establishments primarily engaged in manufacturing firebrick, crucibles, and other heat-resisting products (except diatomaceous earth products) such as glasshouse tank blocks, stoppers, floaters, and rings. This industry also includes refractories and crucibles made of materials other than clay (graphite crucibles), and heat resisting mortar.

326 ABRASIVE PRODUCTS

3261 Abrasive grains, natural and synthetic

Establishments primarily engaged in manufacturing abrasive grains, natural and synthetic.

3262 Grinding wheels

Establishments primarily engaged in manufacturing abrasive grinding wheels of natural or synthetic materials.

3263 Abrasive cloth and paper

Establishments primarily engaged in manufacturing abrasive cloth and paper of natural or synthetic abrasive materials.

3269 Abrasive products, not elsewhere classified

Establishments primarily engaged in manufacturing abrasive sticks, stones and bricks, not elsewhere classified. The cutting of grindstones, pulpstones, and whetstones at the quarry is classified in mining.

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Group No. | Industry No.

327 CONCRETE, GYPSUM, AND PLASTER PRODUCTS

3271 Concrete products

Establishments primarily engaged in manufacturing concrete building blocks and shapes, pipe and conduit, and similar products such as highly pressed concrete pipe, highly pressed cement slate, cement board, cement tile, concrete pipe, cement products for aqueduct use, poles, piling, septic tanks, garbage boxes and other sundry cement products. This industry also produces asbestos slate and pipe.

3272 Gypsum products

Establishments primarily engaged in manufacturing plaster, plaster board, and other products composed wholly or chiefly or gypsum.

3273 Lime

Establishments primarily engaged in manufacturing quicklime, hydrated lime, and dead-burned dolomite from limestone, dolomite, shells, or other substances.

328 CUT-STONE AND STONE PRODUCTS

3281 Cut-stone and stone products

Establishments primarily engaged in cutting, shaping and finishing granite (including diocite and gabbro), liperite (including pumice), andesite, slate, marble, sandstone, tuff and other stone for building and miscellaneous uses. Important products of this industry include monuments and tombstones, dimension stones for buildings, slate blackboards, and stone furniture. Establishments primarily engaged in buying or selling partly finished monuments and tombstones, but performing no work on the stones other than lettering or finishing to custom order, are classified in trade. The cutting of grindstones, pulpstones, and whetstones at the quarry is classified in mining.

329 MISCELLANEOUS NONMETALLIC MINERAL PRODUCTS

3291 Asbestos products

Establishments primarily engaged in manufacturing asbestos textiles, asbestos packing, brake lining, mill board and other heat-resisting and insulating commodities made wholly or chiefly of asbestos. Establishments primarily engaged in manufacturing asbestos slate and pipe are classified in Industry 3271.

3292 Rock wool and its products

Establishments primarily engaged in manufacturing rock wool and rock wool heat resisting and insulating products.

3293 Artificial jewels

Establishments primarily engaged in manufacturing artificial jewels.

3294 Cloisonne

Establishments primarily engaged in manufacturing cloisonne.

3295 Diatomaceous earth and its products

Establishments primarily engaged in pulverizing diatomaceous earth and manufacturing heat resisting articles such as diatomaceous brick and Japanese ovens.

3296 Minerals and earths, ground or otherwise treated

Establishments primarily engaged in grinding, pulverizing, or otherwise treating certain earths, rocks, or minerals, such as mica, barytes, chalk, clays, Cornwall stone, feldspar, kaolin, garnet, pumice, quartz, silica, and talc. Establishments primarily engaged in grinding, refining, and blending natural graphite are also included in this industry.

3299 Miscellaneous nonmetallic products not elsewhere classified

Establishments primarily engaged in manufacturing non-metallic products not elsewhere classified.

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Major Group 33-PRIMARY METAL INDUSTRIES

THE MAJOR GROUP AS A WHOLE

This group includes establishments engaged in the smelting and refining of ferrous and nonferrous metals from ore, pig, or scrap; in the rolling, drawing, and alloying of ferrous and nonferrous metals; and in the manufacture of castings, forgings and other basic products of ferrous and nonferrous metals.

Group No.	Industry No.	
331		SMELTING FURNACES, STEEL WORKS, AND ROLLING MILLS
	3311	Blast furnaces, steel works and rolling mills
		Establishments primarily engaged in manufacturing pig iron in blast furnaces, and in converting pig iron, scrap iron and scrap steel into steel, and in hot rolling iron and steel into basic shapes such as plates, sheets, rods, bars, wire and tubing. In many such establishments the manufacturing processes are carried beyond the hot rolling stage.
	3312	Steel works and rolling mills, without blast furnace facilities
		Establishments primarily engaged in converting pig iron, scrap iron, and scrap steel into steel, and in hot rolling iron and steel into basic shapes such as plates, sheets, strips, rods, bars, wire, and tubing. In many such establishments, the manufacturing processes are carried beyond the hot rolling stage.
	3313	Electric furnaces for pig iron
		Establishments primarily engaged in manufacturing pig iron in electric furnaces.
	3314	Ferro-alloy works
		Establishments primarily engaged in manufacturing ferro-alloys.
	3319	Smelting furnaces, not elsewhere classified
		Establishments primarily engaged in manufacturing pig iron or raw iron in furnaces, not elsewhere classified, such as charcoal furnaces and rotary furnaces.
332		IRON AND STEEL FOUNDRIES
	3321	Gray-iron foundries
		Foundries primarily engaged in manufacturing gray-iron castings, including cast gray-iron pipe and fittings.
	3322	Malleable-iron foundries
		Foundries primarily engaged in manufacturing malleable-iron castings.
	3323	Steel Foundries
		Foundries primarily engaged in manufacturing steel castings.
333		MISCELLANEOUS PRIMARY IRON AND STEEL INDUSTRIES
	3331	Iron and steel forging
		Establishments primarily engaged in manufacturing light and heavy board drop, steam hammer, upset and press forgings with or without the use of dies. Rolling mills engaged in the production of iron and steel forgings are classified in Group 331.
	3332	Wire drawing
		Establishments primarily engaged in drawing wire from purchased iron and steel rods and bars, and which may be engaged in the further manufacture of products made from wire. Rolling mills engaged in the production of ferrous wire are classified in Group 331.

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Group No.	Industry No.	
	3339	Primary iron and steel industries, not elsewhere classified

Establishments primarily engaged in manufacturing flat bright cold rolled strip (including razor-blade strip), cold rolled sheets, cold finished steel bars, ferrous flakes and powders, and other primary iron and steel products, not elsewhere classified. Establishments primarily engaged in annealing and heat treating steel for the trade are also included in this industry.

334 PRIMARY SMELTING AND REFINING OF NONFERROUS METALS

3341 Primary smelting and refining of copper

Establishments primarily engaged in smelting copper from the ore, and in refining copper by electrolytic or other processes. Important products of this industry include copper blocks, slabs, pigs, anodes, ingots, or refinery bars. Establishments primarily engaged in rolling, drawing, or alloying primary copper are classified in Industry 3361.

3342 Primary smelting and refining of zinc

Establishments primarily engaged in smelting lead from the ore and in refining lead by any process. Important products of this industry include lead blocks, slabs, pigs, or ingots. Establishments primarily engaged in rolling, drawing, or alloying primary lead are classified in Industry 3369.

3343 Primary smelting and refining of zinc

Establishments primarily engaged in smelting zinc from the ore, and in refining zinc by any process. Important products of this industry include zinc block, slabs, spelter, pigs, or ingots. Establishments primarily engaged in rolling, drawing, or alloying primary zinc are classified in Industry 3369.

3344 Primary refining of aluminum

Establishments primarily engaged in producing aluminum from the ore or from alumina, and in refining aluminum by any process. Important products of this industry include aluminum blocks, slabs, pigs, or ingots. Establishments primarily engaged in rolling, drawing, or alloying primary aluminum are classified in Industry 3362.

3349 Primary smelting and refining of nonferrous metals, not elsewhere classified

Establishments primarily engaged in smelting and refining nonferrous metals, not elsewhere classified, including gold, silver, platinum, iridium, magnesium, cobalt, nickel, tin, and antimony. Establishments primarily engaged in rolling, drawing, and alloying these nonferrous primary metals are classified in Industry 3369, and the production of bullion at the site of the mine is classified in mining.

335 SECONDARY SMELTING AND REFINING OF NONFERROUS METALS AND ALLOYS

3351 Secondary refining of aluminum and its alloys

Establishments primarily engaged in recovering aluminum and its alloys from scrap and dross, but which are not engaged in further fabrication.

3352 Secondary smelting and refining of lead

Establishments primarily engaged in recovering lead from scrap and dross, but which are not engaged in further fabrication.

3359 Secondary smelting and refining of nonferrous metals and alloys, not elsewhere classified

Establishments primarily engaged in recovering nonferrous metals and alloys, not elsewhere classified, but which are not engaged in further fabrication. Detinning plants engaged in the recovery of tin through secondary smelting and refining are classified in this industry, but those primarily engaged in detinning cans by chemical processes, without the production of tin are classified in Major Group 28. Establishments primarily engaged in assembling, sorting, and breaking up scrap metal, without smelting and refining are classified in trade industries.

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Group No.	Industry No.	
336		ROLLING, DRAWING AND ALLOYING OF NONFERROUS METALS
	3361	Rolling, drawing and alloying of copper

Establishments primarily engaged in rolling, drawing, and extruding copper, brass, bronze, and other copper-base alloy basic shapes such as plates, sheets, strips, rods, wire and tubing. Establishments primarily engaged in producing primary copper alloys are classified in this industry, but establishments primarily engaged in recovering copper and its alloys from scrap or dross are classified in Industry 3359. Establishments primarily engaged in manufacturing insulated wire from purchased copper wire are classified in Major Group 36.

3362 Rolling, drawing and alloying of aluminum

Establishments primarily engaged in rolling, drawing, and extruding aluminum and aluminum base alloy basic shapes such as plates, sheets, rods, wire and tubing. Establishments primarily engaged in producing primary aluminum alloys are included in this industry, but establishments primarily engaged in recovering aluminum and its alloys from scrap or dross are classified in Industry 3351.

3369 Rolling, drawing, and alloying of nonferrous metals, not elsewhere classified

Establishments primarily engaged in rolling, drawing, and alloying nonferrous metals other than copper (Industry 3361), and aluminum (Industry 3362). The products of this industry are produced in the form of basic shapes such as sheets, strips, bars, rods, wire and tubing.

337 NONFERROUS FOUNDRIES

3371 Nonferrous castings, except die castings

Establishments primarily engaged in manufacturing castings of nonferrous metals, except die castings.

3372 Nonferrous die castings

Establishments primarily engaged in manufacturing die castings of nonferrous metals.

338 MISCELLANEOUS PRIMARY NONFERROUS METAL INDUSTRIES

3381 Nonferrous forgings

Establishments primarily engaged in manufacturing nonferrous forgings.

3389 Primary nonferrous metal industries, not elsewhere classified

Major Group 34-FABRICATED METAL PRODUCTS (EXCEPT MACHINERY AND TRANSPORTATION EQUIPMENT)

THE MAJOR GROUP AS A WHOLE

This major group includes establishments engaged in fabricating ferrous and nonferrous metal products, such as tin cans and other tinware, hand tools, cutlery, general hardware, nonelectrical heating apparatus, fabricated wire products, and a variety of metal products, not elsewhere classified. Certain important segments of the metal fabricating industries are classified in other major groups such as machinery in Major Groups 35 and 36, transportation equipment in Major Group 37, professional, scientific, and controlling instruments, watches and clocks in Major Group 38, and jewelry and silverware in Major Group 39. The production of ferrous and nonferrous metals and their alloys and basic products made of metal are classified in Major Group 33.

341 TIN CANS AND OTHER TINWARE

3411 Tin cans and other tinware

Establishments primarily engaged in manufacturing packers' cans, beer cans, general line cans, oil containers, milk and ice cream cans, and other tinware (except household and hospital utensils - Industry 3452) from purchased tinplate, terneplate, blackplate, or enameled sheet metal.

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Group No.	Industry No.	
342		CUTLERY, HAND TOOLS, AND GENERAL HARDWARE
	3421	Cutlery

Establishments primarily engaged in manufacturing cutlery, such as table cutlery (except sterling silver and silverplated cutlery - Industry 3914); scissors, clippers, and razors (including electric), safety-razor blades, manicure implements, pocket knives, butcher knives, and cleavers.

3422 Edge tools

Establishments primarily engaged in manufacturing all kinds of edge tools, except agricultural tools; such as axes, planes, chisels, drawknives; and cutting dies for use in cutting cloth, paper, and leather. Establishments primarily engaged in manufacturing metal-cutting dies are classified in Industry 3543.

3423 Hand tools(except edge tools, machine tools, files, agricultural tools and saws)

Establishments primarily engaged in manufacturing hand tools, such as hammers, wrenches, pliers, screw drivers, and a variety of special tools used by repairmen, jewelers, stone cutters, and iron workers. Establishments primarily engaged in manufacturing edge tools are classified in Industry 3422, files in Industry 3424, saws in Industry 3425, agricultural tools in Industry 3426, and power-driven hand tools in Major Group 35.

3424 Files

Establishments primarily engaged in manufacturing and recutting files and rasps.

3425 Hand saws and saw blades

Establishments primarily engaged in manufacturing hand saws and saw blades for hand and power-driven saws. Establishments primarily engaged in manufacturing power-driven sawing machines are classified in Major Group 35.

3426 Agricultural tools

Establishments primarily engaged in manufacturing rakes, shovels, hoes (mattock), sickles, scythes, spades (plough), etc., used in agriculture.

3429 Hardware, not elsewhere classified

Establishments primarily engaged in manufacturing miscellaneous metal products usually termed "hardware" and not elsewhere classified. Important products of this industry include door locks, locksets, and other builders' hardware; motor vehicle and other transportation equipment hardware; hardware for caskets, furniture, cabinets, saddlery, harness, trunks, and suitcases; locks and padlocks; vacuum bottles and jugs. Establishments primarily engaged in manufacturing bolts and nuts are classified in Industry 3494, nails and spikes in Industry 3471 and cutlery in Industry 3421.

343 HEATING APPARATUS (EXCEPT ELECTRIC) AND PLUMBERS' SUPPLIES

3431 Enameled-iron and metal sanitary ware and other plumbers' supplies

Establishments primarily engaged in manufacturing enameled iron, cast-iron or pressed-metal sanitary ware such as bathtubs, sinks, lavatories, and laundry tubs; and plumbers' brass goods and fittings such as faucets, spigots, and steam and water traps. These establishments may also manufacture small plumbers' valves, stopcocks, and nozzles, but establishments specializing in the manufacture of steam or water-line valves are classified in Industry 3591. Establishments primarily engaged in manufacturing vitreous and semivitreous pottery sanitary ware are classified in Industry 3241, and vitreous-enameled kitchen, household, and hospital ware in Industry 3451.

3432 Oil burners, domestic and industrial

Establishments primarily engaged in manufacturing distillate or fuel oil burners used for installation in heating and cooking equipment, for industrial-process equipment, and for generating steam for power, Establishments primarily engaged in manufacturing complete boiler-burner units and furnace-burner units are classified in Industry 3439.

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Group No.	Industry No.	
	3439	Heating and cooking apparatus, except electric, not elsewhere classified

Establishments primarily engaged in manufacturing heating and cooking equipment, not elsewhere classified. Important products of this industry include stoves, ranges, water heaters, warm-air furnaces, domestic steam and hot water heating apparatus, cast iron and nonferrous radiators, complete gas and oil boiler-burner units, furnace-burner units, boiler, stoker units, incinerators, unit heaters, gas burners, portable ovens, steam tables, and cafeteria food warming equipment. Establishments primarily engaged in manufacturing electric stoves and ranges are classified in Industry 3621, incubators and brooders in Industry 3521, and industrial furnaces and ovens in Industry 3567. Boiler shops primarily engaged in the production of industrial, power, and marine boilers, smoke stacks, heavy tanks, and other plate work are classified in Industry 3443.

344 FABRICATED STRUCTURAL METAL PRODUCTS

3441 Fabricated structural steel and ornamental metal work

Establishments primarily engaged in manufacturing fabricated iron and steel or other metal for structural purposes, and architectural ornamental work of ferrous and nonferrous metals. Important products of this industry include structural steel shapes, stairs and stair cases, fire escapes, grilles, railings, fences, and posts and portable metal buildings. Establishments primarily engaged in manufacturing metal doors, sash frames, molding, and trim are classified in Industry 3442, and fabrication work done by construction contractors at the site of construction is classified in construction.

3442 Metal doors, sash, frames, molding, and trim

Establishments primarily engaged in manufacturing ferrous and nonferrous metal and metal covered doors and sash, window and door frames, store fronts, molding, and trim.

3443 Boiler shop products

Establishments primarily engaged in manufacturing industrial, power, and marine boilers, smoke stacks, heavy tanks, and other boilershop products; and fabricated plate work which involves the cutting, punching, bending, and shaping of steel plates for other industries, or for assembly on the job. Establishments primarily engaged in manufacturing domestic heating and cooking apparatus are classified in Industry 3439.

3444 Sheet-metal work

Establishments primarily engaged in manufacturing cornices, ventilators, skylights, gutters, and other types of sheet-metal work for buildings (not including fabrication work done by construction contractors at the place of construction), and manufacturing sheet-metal stove pipes, light tanks, bins, furnace casings, etc.

345 METAL STAMPING, COATING, AND ENGRAVING

3451 Vitreous-enameled products

Establishments primarily engaged in manufacturing vitreous-enameled kitchen, household, and hospital utensils; table tops; refrigerator, stove and washing machine parts; etc. Establishments primarily engaged in manufacturing enameled iron plumbing fixtures are classified in Industry 3431.

3452 Stamped and pressed metal products

Establishments primarily engaged in manufacturing metal stampings of ferrous or nonferrous metal such as bottle caps and tops, stamped kitchen, household, and hospital utensils, perforated metal, automobile stampings, and stamped and pressed machine parts. Establishments primarily engaged in stamping and spinning metal for the trade are also included in this industry; but establishments primarily engaged in manufacturing vitreous-enameled products are classified in Industry 3451.

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Group No. | Industry No.

3453 Powder metallurgy

Establishments primarily engaged in manufacturing small machine parts by powder metallurgy, involving the mixing, molding, pressing, and sintering of metallic powders.

3454 Enamelling, japanning, and lacquering

Establishments primarily engaged in enamelling, japanning, and lacquering metal products for the trade.

3455 Galvanizing and other hot-dip coating

Establishments primarily engaged in galvanizing iron and steel sheets or formed products; in coating iron sheets or formed products with aluminum, lead or zinc; and in retinning cans and utensils. Most of the work done in this industry is done on materials owned by others. Rolling mills engaged in galvanizing, tinning, and other coating are classified in Group 331.

3456 Engraving on metal

Establishments primarily engaged in engraving, chasing, and etching jewelry, silverware, notarial seals, and other metal products for the trade, for purposes other than printing.

3457 Electroplating, plating, and polishing

Establishments primarily engaged in all types of electroplating, plating, and metal-polishing work. Most of the work done in this industry is done on materials owned by others.

346 LIGHTING FIXTURES

3461 Lighting fixtures

Establishments primarily engaged in manufacturing lighting fixtures and equipment of any type, including electric and gas lighting fixtures, carbide, kerosene, and gasoline lamps, and metal reflectors and fittings. Establishments primarily engaged in producing glassware for lighting fixtures are classified in Major Group 32 and electric light bulbs, tubes, and related light sources in Industry 3651.

347 FABRICATED WIRE PRODUCTS

3471 Nails and spikes

Establishments primarily engaged in manufacturing wire and nails, brads, spikes, staples, and tacks from purchased rods, wire, and tack plate. Establishments primarily engaged in drawing wire from purchased iron and steel rods and in manufacturing nails, brads, spikes, and staples are classified in Industry 3332, and rolling mills manufacturing similar products in Group 331.

3479 Wire work, not elsewhere classified

Establishments primarily engaged in manufacturing from purchased wire, ferrous and nonferrous wire products not elsewhere classified. Important products of this industry include fencing, fly screening cloth and netting, bare wire rope and cable, barbed wire, tire chains, bale ties, concrete-reinforcing wire and mesh, springs, coated welding wire, wire guards and partitions, wire grilles, trays and baskets, and kitchen wire goods. Establishments primarily engaged in manufacturing insulated wire from purchased wire are classified in Industry 3331, and establishments engaged in drawing wire from purchased iron and steel rods and in manufacturing wire products are classified in Industry 3332.

349 MISCELLANEOUS FABRICATED METAL PRODUCTS

3491 Metal shipping barrels, drums, kegs, and pails

Establishments primarily engaged in manufacturing ferrous and nonferrous shipping barrels, drums, kegs, and pails.

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Group No.	Industry No.	
	3492	Safes and vaults

Establishments primarily engaged in manufacturing safes and vaults (except concrete grave vaults - Industry 3271), vault doors and linings, safe-deposit boxes and chests, and safe locks.

3493 Steel springs

Establishments primarily engaged in manufacturing leaf springs, hot wound springs, and coiled flat springs. Establishments primarily engaged in manufacturing wire springs are classified in Industry 3479, and rolling mills manufacturing steel springs in Group 331.

3494 Bolts, nuts, washers, and rivets

Establishments primarily engaged in manufacturing bolts, nuts, washers, rivets, turnbuckles, wood screws, and toggle bolts. Rolling mills engaged in manufacturing similar products are classified in Group 331. Establishments primarily engaged in manufacturing screw machine products are classified in Industry 3495.

3495 Screw-machine products

Establishments primarily engaged in manufacturing automatic or hand screw-machine products from rod, bar, or tube stock of metal fiber, plastics or other material. The products of this industry consist of a wide variety of unassembled parts and are usually manufactured on a job or order basis.

3496 Collapsible tubes

Establishments primarily engaged in manufacturing collapsible tubes made from lead, zinc, aluminum and their alloys.

3497 Gold, silver, tin, aluminum and other foil

Establishments primarily engaged in manufacturing gold, silver, tin, aluminum, and other foil.

3499 Fabricated metal products, not elsewhere classified

Establishments primarily engaged in manufacturing metal products not elsewhere classified, including metal novelties and specialities.

Major Group 35-MACHINERY (EXCEPT ELECTRICAL)

THE MAJOR GROUP AS A WHOLE

This major group includes establishments engaged in manufacturing machinery and prime movers other than electrical equipment (Major Group 36). Machines powered by built-in or detachable electric motors ordinarily are included in this major group, with the exception of electrical household appliances (Major Group 36). Portable tools, both electric and pneumatic powered, are included in this major group, but hand tools are classified in Major Group 34.

351 ENGINES AND TURBINES

3511 Steam engines, turbines, and water wheels

Establishments primarily engaged in manufacturing steam engines, steam turbines, water wheels, and water turbines. Establishments primarily engaged in building or rebuilding locomotives are classified in Industry 3741 and turbo-generators in Industry 3641.

3519 Diesel and semi-diesel engines; and other internal combustion engines, not elsewhere classified

Establishments primarily engaged in manufacturing diesel or semi-diesel engines, not elsewhere classified, for stationary, marine, traction, or other uses. Establishments primarily engaged in manufacturing aircraft engines are classified in Industry 3721, and automobile engines in Industry 3714.

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Group No.	Industry No.	
352		AGRICULTURAL MACHINERY AND EQUIPMENT
	3521	Agricultural machinery and equipment

Establishments primarily engaged in manufacturing agricultural machinery and equipment (except tractors - Industry 3565) for use in the preparation or maintenance of the soil, planting, and harvesting of the crop, preparing crops for market, or for use in performing other agricultural operations and processes. Establishments primarily engaged in manufacturing agricultural hand tools are classified in Industry 3426.

353		CONSTRUCTION AND MINING MACHINERY AND EQUIPMENT
	3531	Construction and mining machinery and equipment

Establishments primarily engaged in manufacturing heavy machinery and equipment (including track-laying tractors) used by construction and mining industries for portable or fixed plant operation, in dredging, excavating, road and airport construction, ore and rock crushing, flotation, screening or washing, ore dressing or concentration, and for use in oil and gas fields or for drilling water wells. Establishments primarily engaged in manufacturing coal and ore conveyors are classified in Industry 3563.

354		METALWORKING MACHINERY
	3541	Machine tools

Establishments primarily engaged in manufacturing power-driven machine tools that shape metal by grinding or progressively cutting away chips. Important products of this industry include boring, broaching, drilling, gear-cutting and finishing, grinding, milling, and planing machines; lathes, shapers, and slotters; honing and lapping, polishing and buffing, sawing and cutting-off, contour-sawing and filing, tapping, threading and rifling machines, and replacement and repair parts for machine tools. The rebuilding of machine tools is included in this industry. Establishments primarily engaged in manufacturing machinery for the shaping, pressing, or forging of metal, where the shaping action of such machines is not dependent upon a cutting tool are classified in Industry 3542; and machine tool accessories and dies, and machinists' precision tools in Industry 3543.

3542 Metalworking machinery, except machine tools

Establishments primarily engaged in manufacturing machinery for shaping, pressing, forging, or bending metal, where the shaping action of such machines is not dependent upon a cutting tool. Important products of this industry include bending machines; can forming and soldering, and other sheet metal working machinery; die casting machines; forging machines, such as drop hammers (impression die); forging hammers (flat die), forging presses, bulldozers, and upsetters; portable power-driven metal-working tools, and flexible-shaft machines; presses (forming, stamping, and punching); riveting machines (not portable); rod and wire forming and fabricating machines; rolling mill machines; acetylene welding and cutting apparatus; wire-drawing machines; and replacement and repair parts. Establishments primarily engaged in manufacturing electric welding apparatus are classified in Industry 3617.

3543 Machine-tool accessories, other metal working machinery accessories, and machinists' precision tools

Establishments primarily engaged in manufacturing attachments and accessories for machine tools and other metal working machinery; small power-driven cutting and shaping tools and tool holders; and precision measuring tools. Important products of this industry include; (1) Attachments for lathes, boring, drilling, and milling machines, and other machine tools; balancing machines; die-casting dies; jigs, fixtures, drop-forging dies, forming and stamping dies and punches, and subpresses; tools for screw and automatic machines; and semi-finished products such as die sets, leather pins, dowel pins, and diesprings; (2) arbors and collars; broaches; collets or sockets; counterbores; countersinks; countersink-drill combinations; drills; cutters; reamers; threading tools (taps, dies, and pipe-threading tools); and other cutting tools and tool holders; (3) precision measuring tools (micrometers and verniers); gauges (plug, ring, snap, and thread); and other measuring tools. Establishments primarily engaged in manufacturing hand tools (except power-driven) are classified in Group 342.