# THE SMALLER INDUSTRY IN JAPAN

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# I.

# POSITION AND ROLE OF SMALL BUSINESSES IN JAPANESE ECONOMY

## 1. What Small and Medium Enterprises Are

*Terminology of Small and Medium Enterprises*

The terminology of "small and medium enterprises" used in Japan is the counterpart of "small businesses, small firms or small enterprises" as used in the United States and Britain and "Handwerks" in Germany. The reason why enterprises of medium size offer few problems in the United States and Britain is because they exist independently without subordinating themselves to large enterprises.

In postwar America, however, the impoverishment of medium-sized enterprises, rather than small enterprises, has come into social attention, and importance has come to be attached to their problems, too. In the United States, the problems of petty enterprises have also come to be taken up, for the fact that the number of petty enterprises, which have been the nucleus of the middle classes and the bulwark of democracy since the time of Mr. Jefferson is visibly decreasing of late is feared to compromise the future of the American democracy. In conception, small enterprises in the United States and Britain are bearing resemblances to small and medium enterprises in Japan. Germany's Handwerks do not merely imply the handicraft. Even if enterprises should adopt mechanized manufacturing processes, they are called Handwerks, in case their entrepreneural scales are small, and their dependence on the personal capabilities of the managers is high. In a strict sense, the conception of Handwerks comprehends small and petty enterprises in Japan. How, then, are Japan's small and medium enterprises defined?

*1) Definition of Small and Medium Enterprises*

In discussing the problems of small and medium enterprises, the question arises in the first place as to the definition of small and medium enterprises. Although there are many studies and documentary records on their definition, no sweeping standard for small and medium enterprises has not been set. The definition differs with countries, persons and ages.

Small and medium enterprises are usually determined by the size of capital, number of employees, production amount, added value, number of machines and equipment, and floor space of factories, and so on. Such quantitative stipulation for small and medium enterprises is indispensable

and simple for statistical analyses of these enterprises. It does not seem sufficient, however, to grasp the conception of these enterprises accurately. In Japan, for instance, enterprises employing 1,000 workers can be regarded as big enterprises in the foodstuffs industry. On the contrary, they belong to the small and medium category in the steel industry. But in these days of technical innovation, industrial automation makes rapid progress, resulting in a sharp reduction in the number of employees. There are cases wherein enterprises which employed 1,000 hands until yesterday no longer need such a large number to operate highly automated machines and equipment, and perhaps 100 employees may be enough. This reduction in the number of employees, of course, does not mean a change in the status of these enterprises. The same can be true of the production amount, value added, number of machines and equipment and floor space of factories. Even if these yardsticks are adopted to distinguish small and medium enterprises from large ones, it seems hardly possible to explain their distinction theoretically.

To define small and medium enterprises is difficult and mere quantative stipulation for these enterprises is not scientific. In Japan, however, small and medium enterprises, from legislative and financial need, by the number of employees and the amount of capital.

The definition of small and medium enterprises in Japan is stipulated for in the Smaller Enterprise Organization Law that has been enacted since April 1958 and laws related to finance to small and medium enprises. The Smaller Enterprise Organization Law, which will be described in detail later, is a legislation designed to permit formation of cartels by small and medium enterprises, thereby stabilizing these enterprises. This law sets the scope for these small and medium enterprises. In manufacturing, transportation and other industries, according to Article 5 of the law, those enterprises which employ no more than 300 workers regularly shall be classified as small and medium enterprises; and less than 30, in commerce and service trade (such as hotels, barber shops, bathhouses and movie theaters). Specific lines of business are stipulated by ordinances in the light of the special conditions under which these businesses are placed. The number of employees, for example, is up to 1,000 in the mining industry, up to 900 in tile-making and chinaware (tableware) industries, up to 600 in weaving machinery and dyeing, up to 150 in construction, and up to 50 in fabrics and hosiery manufacturing and wholesale businesses. Such primary industries as agriculture and fisheries, as well as such liberal professions as lawyers, public accountants and doctors are excluded from the category of small and medium enterprises.

Financial institutions for minor industries lay down their own criteria for smaller enterprises. In manufacturing industries, according to these financial institutions, the number of employees should be no more than 300; in commerce, less than 30; and in the mining industry, less than 1,000. In respect to the capital and loans, the maximum is ¥10 million, respectively.

In short, in case the number of employees is less than 300 (30, in

commerce and service trades), or in case the capital of an enterprise is less than ¥10 million, the enterprise is legally regarded as pertaining to the small-medium enterprise category in Japan.

*2) American Criteria*

For reference, the criteria for small businesses which American government agencies adopt will be introduced. In the United States, there is no uniformity in such criteria, and the definition of small businesses differs from agency to agency. The Department of Commerce follows the pattern of classification that the Census Bureau adopted for the 1939 national census. In the manufacturing industry, enterprises with no more than 100 hands, $500,000 to $1,000,000 in annual sales, $250,000 in total assets and about $100,000 in net assets fall under the category of small enterprises. In wholesale business, importance is attached to net sales, rather than the number of employees, and annual net sales are under $200,000—the amount which will be reached by enterprises with less than 12 employees. In retail and service trades, business units with less than $50,000 in annual sales or receipts and with less than six employees for retail business and less than 20 for service trades come under the category of small businesses.

By the definition framed by the Bureau of Labor Statistics, enterprises of smaller scales than the averages in the respective industries are regarded as small businesses. The number of employees is smaller than 43 in the manufacturing industry; the annual net receipts are less than $209,000 in wholesale business, under $20,000 in retail business and less than $5,000 in service trades.

The Small Business Administration, in compliance with the Small Business Act, defines enterprises conforming to the following conditions as small businesses:

In case enterprises solicit the Government for contract assistance, (1) the aggregate number of the employees of these enterprises and their parent companies should be no more than 500; (2) these enterprises should be independent in management; and (3) they should not be playing a dominant position in respective sectors of industry.

In case enterprises seek loans, their number of employees should be less than 250 in the manufacturing industry; the annual sales should be under $5 million in wholesale business, and annual sales or receipts, less than $1 million in retail business and service trade.

In defining smaller enterprises, the criteria are the number of employees or the size of capital in Japan but either annual sales or receipts in wholesale, retail and service businesses in the United States, although the number of employees is taken as the base in the manufacturing industry. In the United States, qualitative as well as quantitative criteria are adopted. Enterprises in this category should be standing on their own feet, and should not be playing a predominant part in respective segments of industry. The American way of definition seems to characterize small enterprises more realistically and suitably.

*3) The Case Of Southeast Asian Countries*

Naturally the American definition is not applicable to Japan as it is. The American or Japanese definition cannot apply to Southeast Asian countries either as it is. Even in relatively industrialized countries in Southeast Asia like India, it is stipulated that small enterprises shall be capitalized at less than 500,000 rupees, and that in case motive power is employed, the number of employees per enterprise shall be under 50.

This matter was taken up by the committee on small industries of the Economic Commission for Asia and the Far East (ECAFE), too, and the following definition of small industries was laid down:

(1) The handicraft industry is the cottage industry or small-scale industry that manufactures products requiring manual skills in the manufacturing process. (2) The small-scale industry comprises those enterprises or workshops which does not use motive power and employs less than 50 regular hands and those enterprises or workshops which use motive power and less than 20 employees. (3) The cottage industry consists of those business units which are managed mainly by family members.

After all, it seems impossible to lay down common criteria for smaller industries in various countries because the economic and other conditions under which these industries find themselves differ with countries.

*4) Petty Enterprises*

Small and medium enterprises are not uniform in scale. According to the Economic White Paper for 1958 compiled by the Economic Planning Board, the business units employing less than 30 workers are regarded as "petty enterprises" in the manufacturing industry, and "petty enterprises" using less than four workers are classified as enterprises of family management. In most cases, enterprises with more than four hands have some employees besides family members, and they are different from petty enterprises with less than four workers in economic foundation. In a strict sense, therefore, it seems appropriate to limit petty enterprises to business units with less than four hands and even if some employees should be added, the number of workers should be less than 10. Prof. J.D. Phillips of the University of Illinois points out the following characteristics of those petty enterprises which are being operated with less than four hands: (1) In these enterprises, there are few wage earners or the number of helpers is usually limited to one or two. (2) The owners of enterprises directly participate in the process of labor, including service to business clients. (3) Specialization of management and supervision by entrepreneurs is lacking. (4) Capital accumulation seems impossible, and since the main concern of the entrepreneurs is over their family livelihoods, their motive for business expansion is apt to be restricted.

For the foregoing reasons, it seems necessary to distinguish small and medium enterprises under capitalism from petty enterprises depending on family labor, in looking into what is broadly called the small-scale industry.

Then, in case enterprises with less than 300 employees are defined as small and medium enterprises in the manufacturing industry, how many enterprises are there in this category in Japan? And what position do they occupy, and what role are they playing, in the Japanese economy?

## 2. Position and Role of Small and Medium Enterprises

### *1) Enterprises in Considerable Numbers*

The Prime Minister's Office's statistics on places of business (1957) revealed that there are as many as 3,530,000 or more establishments throughout the country (See Table 1). These places of business could be classified broadly into mining, construction, manufacturing, wholesale and retail, finance and insurance, real estate, transportation and communication, electric power, gas, water supply and service trades.

**Table 1: Number of Places of Business by Number of Employees**

| Industry | Total (A) | 1–4 pers. | 5–9 " | 10–19 " | 20–29 " | 30–49 pers. | 50–99 " | 100–199 " | 200–299 " | Sub-total of less than 300 scales (B) | B/A (%) | 300–499 pers. | 500–999 " | Over 1,000 " |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| All Industries | 3,535,045 | 2,739,172 | 449,383 | 199,265 | 60,660 | 44,738 | 25,677 | 9,511 | 2,800 | 3,531,206 | 99.89 | 1,961 | 1,158 | 720 |
| Mining | 10,192 | 4,414 | 1,887 | 1,445 | 591 | 612 | 494 | 299 | 134 | 9,876 | 96.89 | 125 | 99 | 92 |
| Construction | 178.294 | 130,995 | 21,339 | 12,979 | 4,753 | 3,903 | 2,697 | 1,069 | 257 | 177,992 | 99.83 | 175 | 102 | 25 |
| Manufacturing | 544,604 | 288,894 | 123,033 | 70,337 | 24,352 | 18,216 | 11,291 | 4,713 | 1,479 | 542,315 | 99.57 | 1,070 | 706 | 513 |
| Wholesale, retail | 1,806,326 | 1,542,452 | 182,320 | 58,894 | 12,274 | 6,518 | 2,721 | 825 | 131 | 1,806,135 | 99.98 | 111 | 47 | 33 |
| Finance, insurance | 51,167 | 27,885 | 8,613 | 6,889 | 3,098 | 2,812 | 1,340 | 318 | 113 | 51,068 | 99.80 | 50 | 35 | 14 |
| Real estate | 23,626 | 21,659 | 1,250 | 439 | 113 | 77 | 55 | 22 | 4 | 23,619 | 99.97 | 5 | 2 | — |
| Transportation, communications | 67,717 | 40,544 | 10,359 | 7,060 | 2,944 | 2,605 | 2,287 | 1,154 | 391 | 67,344 | 99.44 | 252 | 98 | 23 |
| Power, gas, water supply | 8,339 | 4,250 | 1,362 | 1,054 | 492 | 387 | 339 | 251 | 102 | 8,237 | 98.77 | 72 | 23 | 7 |
| Service trades | 844,780 | 678,079 | 99,220 | 40,168 | 12,043 | 9,608 | 4,453 | 860 | 189 | 844,620 | 99.98 | 101 | 46 | 13 |

**Source:** Prime Minister's Office's Bureau of Statistics.

Singling out the manufacturing industry from among these, there are more than 544,000 establishments in the industry, 99.57 per cent of which, or 542,000 units, are the so-called small and medium enterprises with less than 300 employees. A substantial chunk of these small and medium enterprises are of such scales as to employ less than 10 hands. They number 412,000 units, or about 76 per cent of the total small and medium enterprises in the manufacturing industry.

Another survey conducted by the Smaller Enterprise Agency (as of end-December 1957) shows that the number of enterprises in the manufacturing industry is 405,000, about 73 per cent of which are small-scale enterprises under individual management. These small enterprises may be roughly regarded as places of business with less than 10 employees each. The same survey reveals that 96 per cent of the 109,000 enterprises other than those under individual management, when classified by the scale of capital, belong to the under ¥10-million bracket.

In the manufacturing industry that is rich in the variety of products, these small and medium enterprises swarm in the light industry sectors such as clothing, personal outfittings, wooden products, furniture, publishing, printing, rubber products and leather products. In the fields of chemical, steel, non-ferrous metal, electrical machinery and transportation machinery industries, however, large enterprises are playing an active part, although the number of small enterprises is far larger than that of giant enterprises. In these heavy and chemical industries, especially in the fields of machinery, steel and non-ferrous metals, many small and medium enterprises are subcontracting for larger ones.

*2) Special Structure of Employment*

Table 2 indicates industry-by-industry numbers of employees in the light of entrepreneural scales. According to the table, 73.54 per cent of the labor force in the manufacturing industry comes under the category of small and medium enterprises (See Table 2).

**Table 2: Number of Employees by Industry Scale**

| Industry | Total (A) | 1–4 pers. | 5–9 〃 | 10–19 〃 | 20–29 〃 | 30–49 pers. | 50–99 〃 | 100–199 〃 | 200–299 〃 | Sub-total of less than 300 scales (B) | B/A % | 300–499 pers. | 500–999 〃 | Over 1,000 〃 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| All Industries | 20,815 | 5,446 | 2,875 | 2,652 | 1,438 | 1,679 | 1,718 | 1,294 | 675 | 17,781 | 85.42 | 738 | 791 | 1,503 |
| Mining | 527 | 9 | 12 | 19 | 14 | 23 | 34 | 41 | 32 | 187 | 35.56 | 46 | 71 | 221 |
| Construction | 1,372 | 227 | 138 | 174 | 112 | 146 | 181 | 143 | 61 | 1,187 | 86.52 | 65 | 69 | 49 |
| Manufacturing | 7,448 | 699 | 803 | 944 | 578 | 683 | 764 | 646 | 357 | 5,478 | 73.54 | 404 | 482 | 1,083 |
| Wholesale, retail | 5,967 | 3,078 | 1,146 | 762 | 288 | 240 | 179 | 110 | 31 | 5,837 | 97.82 | 41 | 33 | 54 |
| Finance, insurance | 607 | 55 | 57 | 94 | 73 | 105 | 87 | 42 | 26 | 544 | 89.53 | 18 | 24 | 20 |
| Real estate | 62 | 32 | 7 | 5 | 2 | 2 | 3 | 2 | (684) | 58 | 93.73 | 1 | 1 | — |
| Transportation, communications | 1,020 | 78 | 67 | 96 | 70 | 98 | 157 | 157 | 93 | 820 | 80.42 | 95 | 63 | 41 |
| Power, gas, water supply | 192 | 8 | 9 | 14 | 11 | 14 | 24 | 34 | 24 | 141 | 73.30 | 27 | 15 | 8 |
| Service trades | 3,615 | 1,257 | 631 | 540 | 285 | 363 | 285 | 114 | 45 | 3,523 | 97.45 | 37 | 30 | 23 |

**Source:** Prime Minister's Office's Bureau of Statistics.

A close look at this table shows that in the manufacturing industry, employees concentrate on small factories with less than 20 workers and giant plants with more than 1,000 hands. This type of employment distribution may be termed as polarization of employment, characterizing the prewar and postwar structure of employment of Japan. In the United States, Britain and West Germany where capitalism has advanced to a considerable stage, employment centers on large or near-large enterprises.

The basic cause of this polarized employment is the unique development of capitalism in Japan. When Japan was opened to foreign intercourse, capitalism had made considerable progress in Western countries. To catch up with these advanced countries, the Japanese Government in the Meiji Period encouraged the development of industries with particular emphasis on heavy and chemical industries. In parallel with the developing heavy and chemical industries, the traditional light industries were obliged to grow by themselves feebly as labor-intensive industries. Furthermore the domestic market was so narrow and manpower was so cheaply available in the agricultural community that petty enterprises mushroomed. Large enterprises were bent on expanding their industrial facilities and increasing their employees. Petty enterprises on their part increased because their business paid if they could hire workers at low wages. These phenomena resulted in the polarization of employment.

*3) Manufactured Goods Shipped*

Then, what about the share of small and medium enterprises in the total shipment value of manufactured goods? According to the 1957 statistics, enterprises of less than 300 hands account for 51.72 per cent of the total shipment value of the manufacturing industry. The total number of places of business in this industry is 463,727, a bare 0.4 per cent of which, or 2,079, are larger enterprises employing more than 300 workers. Hence, this small number of large enterprises on the one hand and more than 460,000 small enterprises on the other are halving the total shipment value (See Table 3).

**Table 3: Value of Shipment by Entrepreneural Scale**

| Scale by No. of Employees | No. of Workshops | No. of Employees (1,000 pers.) | Shipment of Manufactures (¥1 million) |
|---|---|---|---|
| TOTAL..... | 436,727 (100.00) | 6,604 (100.00) | 10,457,650 (100.00) |
| Less than 3 pers. ..... | 248,712 ( 53.63) | 562 ( 8.51) | 230,772 ( 2.20) |
| 4— 9 pers. ..... | 94,265 ( 20.32) | 605 ( 9.16) | 411,686 ( 3.99) |
| 10— 19 〃 ..... | 64,200 ( 13.84) | 864 ( 13.08) | 763,949 ( 7.30) |
| 20— 29 〃 ..... | 22,390 ( 4.82) | 532 ( 8.05) | 560,558 ( 5.36) |
| 30— 49 〃 ..... | 16,350 ( 3.52) | 614 ( 9.29) | 734,896 ( 7.02) |
| 50— 99 〃 ..... | 10,214 ( 2.20) | 693 ( 10.49) | 996,012 ( 9.52) |
| 100—199 〃 ..... | 4,136 ( 0.89) | 565 ( 8.55) | 1,017,154 ( 9.72) |
| 200—299 〃 ..... | 1,381 ( 0.29) | 335 ( 5.07) | 695,490 ( 5.69) |
| 300—499 〃 ..... | 975 ( 0.21) | 372 ( 5.48) | 940,475 ( 9.02) |
| 500—999 〃 ..... | 627 ( 0.13) | 433 ( 6.57) | 1,154,035 ( 11.03) |
| Over 1,000 〃 ..... | 477 ( 0.10) | 1,024 ( 15.55) | 2,952,619 ( 28.23) |

**Source:** Ministry of International Trade Industry (1957).
(Any fractional sum less than ¥1 million was discarded.)

In its 1957 survey, the Fair Trade Commission pointed out the fact that a small number of monopolistic large enterprises account for the greater part of production in most sectors of industry. For instance, there were 688 companies in the coal industry, but 10 major firms of these were responsible for 53.5 per cent of the total coal output. In the cotton spinning industry, 10 large spinners accounted for 50.5 per cent of the industry's production. In the fields of rayon yarn and synthetic fibers, 10 big manufacturers are turning out almost all products; in the steel industry, 10 steelmakers account for 95.5 per cent of the total steel output; in the aluminium industry, three major companies are meeting almost all demands; in the automobile industry, eight automakers are monopolizing the production of chassis for ordinary vehicles; and in the shipbuilding industry, 10 shipbuilders account for 65.8 per cent of the total production.

These large enterprises and smaller enterprises do not stand on the same footing in their business relations, but the former subordinates the latter, a relationship which is the very root of many knotty problems in the small industries.

*4) Role in Export Trade*

As described above, smaller industries occupy an indisputable position in the Japanese industrial structure, and so do they in the nation's export trade. According to the joint study of the Smaller Enterprise Agency and the Osaka Prefectural Government's Economic Research Institute, small enterprises accounted for 45.3 per cent of the total exports in 1952, but their ratio rose to 50.2 per cent in the following year, 52.1 per cent in 1954, and 51.5 per cent in 1955 (See Table 4). Their ratios during the period of 1929 to 1933 averaged 41.7 per cent. It can be said, therefore, that smaller industries have been playing an importnat role in Japan's export trade throughout prewar and postwar years.

Although the ratios of smaller enterprises in export trade have not changed much since prewar days, the export picture is not the same in substance. In the first place, Japan's export markets have changed sharply. In prewar days, exports to China, Korea and Formosa used to account for nearly 40 per cent of the total exports, but today exports to such neighboring countries have dropped to 10 per cent or so. Of the nation's exports, Southeast Asian countries have come to account for 30 per cent and North America, 20 per cent. In the second place, export commodities have altered. The share of textile products has become smaller than in prewar days, and instead chemical products, metals and metal products, especially machinery, have enhanced their positions in the export picture.

Such is also the case with exporting small and medium enterprises. In fact, exports of cotton yarns and textiles, rayon fabrics, knitted goods, matches, bicycles, parts of spinning and weaving machinery, enameled ironware, vacuum bottles, etc., which were being exported to the Chinese continent in quantities in prewar days, have decreased visibly, but sewing machines, binoculars and cameras have become important export

**Table 4: Smaller Industries in Exports, Production**

*(Unit: ¥1 billion)*

| Classification | Shipment value (A) | 1954 Value of exports Total (B) | B/A | 1954 Value of exports SI (C) | C/B | 1955 Value of exports Total (B) | 1955 Value of exports SI (C) | C/B |
|---|---|---|---|---|---|---|---|---|
| TOTAL | 6,250.1 | 572.6 | 9.16 | 297.9 | 52.1 | 709.2 | 365.2 | 51.5 |
| Foodstuffs mfg. | 1,117.3 | 45.7 | 4.09 | 37.6 | 82.1 | 46.2 | 36.8 | 79.9 |
| Spinning, weaving | 1,041.9 | 202.1 | 19.40 | 114.8 | 56.8 | 217.9 | 128.4 | 59.1 |
| Clothing | 88.1 | 22.8 | 25.88 | 20.5 | 90.1 | 39.7 | 36.5 | 91.9 |
| Lumbering, woodwork | 271.5 | 20.1 | 7.39 | 17.2 | 85.6 | 27.3 | 23.2 | 85.0 |
| Furniture, fixtures | 56.2 | 1.2 | 2.20 | 1.2 | 96.6 | 2.1 | 2.0 | 97.6 |
| Paper, imitations | 247.1 | 5.1 | 2.08 | 2.3 | 45.1 | 7.0 | 2.6 | 36.6 |
| Printing, publishing | 210.7 | 1.1 | 0.52 | 0.8 | 69.4 | 1.2 | 0.9 | 70.0 |
| Chemicals | 652.2 | 43.5 | 6.67 | 10.6 | 24.5 | 50.8 | 14.4 | 28.3 |
| Petroleum, coal | 116.1 | 0.3 | 0.29 | 0.01 | 3.9 | 1.1 | 0.1 | 5.4 |
| Rubber products | 85.8 | 4.2 | 4.93 | 1.3 | 31.6 | 6.1 | 1.8 | 29.4 |
| Leather, leather goods | 34.5 | 0.8 | 2.27 | 0.7 | 91.3 | 1.4 | 1.2 | 91.7 |
| Glass, earth, stone products | 222.1 | 26.9 | 12.10 | 14.0 | 52.0 | 34.0 | 17.9 | 52.5 |
| Primary metal | 784.5 | 76.4 | 9.74 | 7.5 | 9.9 | 118.6 | 12.4 | 10.4 |
| Metal products | 198.7 | 14.6 | 7.35 | 11.8 | 76.1 | 21.7 | 18.2 | 84.1 |
| Munitions | 326.4 | 1.7 | 11.80 | 0.2 | 51.9 | 0.3 | 0.03 | 2.9 |
| Machinery | | 36.8 | | 19.8 | | 37.2 | 22.0 | 59.8 |
| Electrical machinery, equipment | 271.2 | 8.6 | 3.18 | 5.1 | 58.6 | 11.0 | 6.2 | 56.5 |
| Export machines, equipment | 368.9 | 26.6 | 7.21 | 4.1 | 15.6 | 42.7 | 6.6 | 15.5 |
| Medical, physical, chemical apparatuses | 56.6 | 7.3 | 12.91 | 4.3 | 59.2 | 9.8 | 6.5 | 66.5 |
| Others | 100.3 | 26.6 | 26.54 | 24.8 | 93.0 | 33.2 | 31.3 | 94.3 |

**Note:** "SI" signifies smaller industries.

commodities.

In postwar years, Japan's major export destinations of industrial products are the markets in the United States and Southeast Asia, but those labor-intensive commodities which smaller enterprises laboriously manufacture are being exported mainly to the U.S. markets, while labor-saving commodities which large enterprises are turning out are being shipped to Southeast Asian countries. Table 5 illustrates the shipment values of 36 export commodities to these two different markets, excepting fabrics, metal products and heavy machinery. These exports to the United States, Latin America and Canada include ceramics, plywood, toys, binoculars, cameras, artificial flowers, sewing machines, carpets, gloves, cutlery, bamboo blinds, imitation pearls, bands for wrist watches, tools, spectacle lens, hand-sewing needles and pocketknives. Goods being actively exported to Southeast Asian markets are bicycles, metal household utensils, towels, enameled ironware, fountain pens, vacuum bottles, rubber products, clocks, matches, files, and celluloid manufacture.

Brisk exportation of products of smaller enterprises may be explained by the following factors:

(1) Heavy and chemical industry products being manufactured mainly by large enterprises are still not so competitive on the world markets.

(2) The domestic market is narrow.

(3) Abundant manpower is available.

Particularly cheap labor has been one of the powerful weapons for these smaller industries. Internecine competition among these enterprises often gives rise to underselling. Respective industry circles are making efforts to remedy such evils by encouraging formation of export associations or conclusion of export agreements, but moves towards import restrictions in importing countries always compromise the export prospects of these smaller industries. Then how low are Japanese wages in smaller industries and how are they correcting the situation?

**Table 5: Markets for Japanese Exports (1954)**

| To U.S. Markets | | To Asian Markets | |
|---|---|---|---|
| Item | Ratio agt. Total (%) | Item | Ratio agt. Total (%) |
| Frozen tuna | 80 | Ammonium sulphate | 99 |
| Bamboo work | 86 | Phosphatic fertilizers | 97 |
| Canned tuna | 84 | Rayon yarns | 95 |
| Rugs | 81 | Staple fiber yarns | 93 |
| Binoculars | 71 | Cement | 90 |
| Plywood | 64 | Fabrics | 86 |
| Raw silk | 59 | Cotton yarns | 85 |
| Cultured pearls | 55 | Galvanized iron sheets | 85 |
| Toys | 54 | Spinning machines | 81 |
| Ceramics | 47 | Internal combustion engines | 77 |
| Liver oil | 42 | Paper, paper boards | 76 |
| Heads of sewing machines | 33 | Coaches, freight wagons | 68 |
| | | Rails | 66 |
| | | Cotton fabrics | 56 |
| | | Rayon fabrics | 48 |

*5) Wage Differential between Big and Small Firms*

According to the Labor Ministry's monthly survey, if the wage index for enterprises of more than 500 employees should be taken as the base in the manufacturing industry, the index for enterprises with 100 to 499 workers dropped to 69.78 in 1958 from 79.5 in 1951. In the case of enterprises with 30 to 99 hands, the index dipped to 54.7 from 61.7. The situation was even worse in enterprises with five to 29 employees, and their wage index was 43.6 in 1958.

Even in 1959 when the wage differential between small and large enterprises was said to be narrowed down most appreciably, the wage index for enterprises of 100 to 499 workers was 69.6; enterprises with 30 to 99 workers, 56.1; and those with five to 29 employees, 44.3 (See Table 6). It is often said that Japan's labor wages are equivalent to about one-eighth of America's, one-third of Britain's, and half of West Germany's or France's. It is to be noted, however, that the wage differential among Japanese enterprises themselves is unfairly wide. Naturally a mere international comparison does not faithfully represent actual wage conditions in respective countries, since different methods are employed for different countries and the coverage of the investigation is

not always uniform. In view of the fact that petty enterprises employ many resident factory hands, a mere comparison of wages between small and large companies is misleading. Nevertheless these comparisons will display the general trend of wages in Japan.

Such a wide disparity between large and small enterprises is seen not only in monthly wages but also in semi-annual bonuses. The enterprises employing more than 500 workers paid bonuses in 1958 equivalent to 24.6 per cent of wages, but the smaller the scale of enterprises, the smaller the bonuses. In the same year, petty enterprises employing less than four hands could give a bare six per cent of the regular pay as the bonus. In large companies, there is the periodical wage hike system, but smaller enterprises cannot afford to raise wages regularly.

**Table 6: Wage Disparity by Scale of Enterprises in Manufacturing Industry**

(Enterprises with over 500 workers=100)

| Year | 100–499 pers. (employees) | 30–99 pers. | 5–29 pers. |
|---|---|---|---|
| 1954 ..... | 77.6 | 59.9 | — |
| 1955 ..... | 74.3 | 58.8 | — |
| 1956 ..... | 72.1 | 56.1 | — |
| 1957 ..... | 70.8 | 56.0 | — |
| 1958 ..... | 69.7 | 54.7 | 43.6 |
| 1959 ..... | 69.6 | 56.1 | 44.3 |

### *6) Long Working Hours*

Along with low wages, long working hours are another unwelcome characteristic of small industries in Japan. To make matters worse, the difference in working hours between small and large enterprises is ever widening. Taking the working hours in enterprises employing over 500 prsons as the base, the index of working hours for those hiring 100 to 499 workers was 102.5 in 1951 and rose to 105.48 in 1958. The index for workshops using 30 to 99 hands also rose to 109.5 by 1958 from 102.7 in 1951. Even in 1959 when the wage disparity between enterprises of different scales improved notably, the working hours in small enterprises were as long as ever. With enterprises with over 500 workers as the base, the index of working hours stood at 104.8 for companies using 100 to 499 persons in 1959, and 109.1 for those employing 30 to 99 workers.

The smaller the scale of an enterprise, the longer its working hours. The situation is particularly unwholesome in petty enterprises, and the Labor Standard Law which stipulates eight working hours a day is not actually observed at all. When business is booming, such ultra-small enterprises are apt to force their employees to work longer to earn more; when business is sluggish, they prolong the working hours to cover price declines. In other words, regardless of business ups or downs, the working hours are always long in these small enterprises. Since such workshops usually lack adequate sanitation or safety devices, many accidents befall employees.

*7) Problems of Latent Unemployment*

The low wages and long working hours upon which small industries are dependent are ascribed to the fact that these enterprises cannot afford to purchase more efficient machines and equipment to attain higher productivity, because of their weak financial power. The organizational weakness of labor unions in small industries may also be responsible for them. However, the strong pressure of latent unemployment in the farming communities which make these low wages and long working hours possible cannot be overlooked.

Among those who are engaged in agriculture and small industries, there are many potentially jobless people. They are working in these industries because they cannot find other jobs. The reasons for the high rate of latent unemployment are the over-population of Japan itself and also that mining and manufacturing industries have not been developed to such an extent as to absorb much of unemployment.

Agriculture still counts on family-workers ,and employment measures for second and third sons still remain big social problems. In the average farm household, which is making a meager living by cultivating a strip of land, second and third sons are a surplus population for the household from birth. When they reach a working age, they are compelled to flow into big towns to seek employment; once a business slump takes place, they lose their jobs, return to their native places and stay with their brothers, helping farm working. They are coming back to their native places not to work as farmers but to come upon the hands of their brothers. They are called the potentially jobless, and the existence of a good number of such potentially jobless people is prone to aggravate the wage level in smaller industries.

In addition, the fact that large enterprises would employ exclusively the new graduates of junior high school, has made labor market very closed. Since the progress of industrial modernization and rationalization results in reducing the employment-absorbing power of large enterprises, an increasing number of job seekers are forced to go to small industries. Large enterprises hardly hire employees of small industries; they employ mainly those fresh from junior high schools, adopting the system under which wages increase according to the length of service. Thus large enterprises make their employees stay on, thereby blocking the inflow of laborers from small enterprises. The freezing of labor movments also leads to a wage disparity between small and large enterprises.

In recent years, however, the wages of young employees in small industries have been improved to a considerable degree. This phenomenon began to show itself at the time of the Jimmu-keiki boom of 1956-57. It was partly as a result of increasing demand for such young workers and partly as a result of the need to obtain promising workers for industrial modernization by raising wage standards. All this had close bearings on enactment of the Minimum Wage Law which will be dwelt on later.

## 3. Development of Small Industries

The previous chapters have explained that small enterprises are playing a vital role in the phases of industrial production, export trade and employment in Japan. Then why have these small enterprises mushroomed in Japan?

This chapter purports to shed light on the historical background against which small industries have grown. Of course it was from the monopolistic stage of capitalism on which problems on small industries began to crop up in the present form. In order to realize the unique features of Japanese small industries, however, there seems to be the need to date back to the Meiji Restoration of 1868.

### 1. *Formation of Japanese Capitalism and Small Enterprises*

Japan's capitalism began to ferment about 100 years ago. Unlike in Britain and other West European countries, however, it was not based on the spontaneous growth of the popularity of civic strength. At that time Japan had no proper ground for capitalism as yet. The Meiji government which was bent on catching up with advanced capitalist countries quickly nursed it by inviting foreign technicians as well as importing machines and equipment to develop steel and other heavy industries under heavy state protection. Thus the so-called zaibatsu concerns had fortified their business foundations.

On the contrary, however, light industries except for spinning hardly enjoyed government assistance. They were those native industries which had existed since the Tokugawa Period—such as cotton yarn, raw silk, fabrics, ceramics, lacquer ware, Japanese paper, sugar, steel and copper industries. Abandoned by the Meiji government, these industries had no alternative but to be operated with the small capital which was saved up by landlords or rich farmers. In 1884 Mr. Masana Maeda in a statement of views on industrial development criticized the manner in which the government was fostering the national industry and said that it was just like putting the cart before the horse to be intent on importing a modern machinery industry from foregin countries, while ignoring the development of native industries which were the very pride of Japan.

Among these native industries, those which were not benefitted by the introduction of foreign technology and equipment strived for industrial modernization by themselves, while some others which were transplanted from foreign countries settled down in Japan as small industries. The former included cast metal, ceramics, lacquer ware, fancy matting and straw plait; the latter embraced knit goods, towels, watches, bicycles, matches, brushes, soap, shell-buttons, umbrellas and toys. All these were no better than cottage industries, and today they have become the nucleus of Japanese small industries. That is why small industries are engaged mainly in production of consumer goods and their management is outdated today. It can be said, therefore, that the unbalanced foster-

ing of a capitalist economy during the Meiji Restoration period is still having lingering influence.

Japan's capitalism founded itself on the induction of modern industries from foreign countries, but it was around 1887 to 1897 that it began to establish its niche. Around 1887, the cotton spinning industry established the mechanized production system, and on the strength of economic advancement resulting from the Sino-Japanese War in 1894, Japan's industrial capital was built up by about 1897, centering around light industries.

The development of the spinning industry was most outstanding in light industries. By 1895, cotton yarn exports were more than the amount of its imports after the Sino-Japanese War, and the increased production of fine counts of yarn enabled Japan to drive British products out of its markets. In the silk-reel industry which was the No. 1 export industry accounting for more than 30 per cent of the total exports, the production by silk-reeling machines exceeded that by hand by 1894, the production scale became the largest in the world by 1909, and nearly 70 per cent of the production was done by machine towards the close of the Meiji Era. However, about 80 per cent of the enterprises were small, and silk-reeling by hand remained as farmers' side line.

Along with the remarkable development of the spinning industry, the production of fabrics also rose sharply. The production of cotton fabrics was started around 1890 by spinners. The number of weaving machines in operation averaged 420 units per factory at the time of the Sino-Japanese War, but rose to 5,000 units by the time of the Russo-Japanese War (1904) and further to 25,000 units at the time of World War I. The production of silk fabrics also showed rapid development by the use of imported machines specifically in and after World War I. During this period, mechanization of the textile production made notable progress.

In the field of heavy industries, too, visible development was witnessed in steel and machinery industries, but it was far too smaller than that in light industries, especially spinning. It was after World War I that heavy industries attained remarkable development and caught up with light industries in growth tempo.

Thus Japan's capitalism was established, but feudalistic relations in production were retained. In agriculture, for instance, farmers were forced to submit to extremely low standards of living which indirectly pulled down the wage standards of urban workers and offered uniquely cheap labor. Such lowness of living standards inevitably narrowed down the domestic market, compelling Japan to seek markets abroad. As a whole the weight of Eastern countries was heavier in Japan's export markets than that of Western countries. Shipped to the Western markets were chiefly the products of native industries such as raw silk, habutae silk, brass, straw plaits, fish oil and china and porcelain. These exports were shipped in return for the importation of machines, steel, metal products, chemicals, etc. from Western countries. To Eastern countries, cot-

ton yarn, cotton fabrics, knitted goods, matches, marine products and watches were exported to earn the means to purchase raw cotton, foodstuffs, crude sugar, petroleum, jute, mineral ores, and what not from these countries. Japanese native industries were therefore playing an important role as export industries in securing raw materials and products for heavy and chemical industries.

2. *Emergence of Problems in Small Industries*

Japan's capitalism which had formed the foundation of industrial capital principally for light industries developed into the stage of monopoly through encouraging the concentration of capital since a little before the Russo-Japanese War. After World War I, monopolistic trends became pronounced, and financial capital began to be formed. Heavy and chemical industries thus took long strides during this period. In the steel industry, the state-run Yawata Iron Works which started operation in 1901 expanded its facilities, and several other iron works were established by the government. These iron works have grown up today to become the nucleus of the nation's intergrated steel industry. Marked development was also seen in machinery, munitions, shipbuilding, rolling stock and their parts industries. The production of automobiles and aircraft was also started. Many of the industrial machines were manufactured domestically, and spinning machines came to be exported. But the machine tool industry was unable to meet the domestic demand, although its production rose 18 times during World War I.

The cotton yarn and spinning industries also showed trends towards capital concentration, and these tendencies became prominent notably after the Russo-Japanese War. Stimulated by World War I, these industries made great strides both quantitatively and qualitatively. The suspension of the importation of quality products from Great Britain also encouraged the Japanese industries to shift their production emphasis to finer counts of yarns.

In the process of progress to a monopolistic stage, native industries gradually fortified their positions as small industries and developed their manufacturing or factory foundations by introducing motive power and mechanical power. World War I, of course, gave an impetus to this tendency.

It was to be admitted, however, that those small and petty enterprises which had counted much on manual work in production expanded their production scales by the use of machines, but their financial feebleness placed them under the thumb of wholesale dealers. In terms of production techniques, industrialization made progress, but socio-economically, industries were under the wholesale system.

Some of the small enterprises expanded themselves to small-scaled industries through mechanization, but by that time monopolistic large enterprises made new and startling development. The gap between small and gigantic enterprises had become too distinct to fill. And between them developed the relationship of master and servant. Monopolistic

large enterprises were dominating the production and import of raw materials, sales channels of products, and financial resources, thereby subjugating smaller industries. Their power over smaller enterprises grew bigger through business recessions after World War I. The result was that there were seen trends towards monopolization of capital and production by large enterprises on the one hand and impoverishment of small enterprises under the crushing pressure of large enterprises on the other. During this period of time, business failures in handicraft and cottage industries and small and medium scale businesses were taken up as social problems.

At the stage of capitalistic monopoly, numerous enterprises of small and medium sizes were dominated by a handful of gigantic enterprises, and their smooth growth was arrested. Their close relations with the farming community gave rise to various feudalistic problems in these smaller enterprises. Public concern over the problems of small and medium industries began to be aroused after the 1920 panic that followed World War I, particularly after the 1922 financial crisis caused by the disastrous earthquake in the Kanto area, and it was after the 1927 financial pinch that the industries' inherent problems came to be tackled squarely.

3. *War Structure and Occupational Problems*

The Manchurian Incident broke out in 1933. In 1937, the Sino-Japanese War and in 1941 World War II burst forth. The Japanese economy was switched to war structure, and during wartime, diminishing civilian demands and the drafting of workers brought about occupational change and unemployment problems in small industries first.

The outbreak of the Sino-Japanese War animated the nation's economic activities in the initial stage, but by the time when the National General Mobilization Law was enacted in 1938, war structure was established. Under the increasing scarcity of materials, small industries were regarded as considerable obstacles in the way of munitions production. With a view to consolidation and integration of small enterprises, therefore, the government pushed ahead their mergers by amending the Industrial Association Law. By the beginning of 1942, consolidation measures were taken one after another for machinery, steel, knit goods, agricultural implement, automobile parts, bicycle, small shipbuilding, iron rolling, cast metal, light metal processing, enameled ironware, glass, ceramics, rubber, leather, celluloid processing, glue-manufacturing, soap, confectionary, briquette and several other industries.

As the war situation progressed, the government announced enterprise reorganization measures for the purpose of strengthening the nation's war potential in 1943. These measures were designed to mobilize industrial potentialities to manufacture aircraft. Textile and daily necessities industries were converted to this end. These converted factories cooperated with ordering factories, and the relationship of parent factories and subcontractors was strengthened. In 1943, the Commerce

and Industry Association Law was instituted to replace the Industrial Association Law; it aimed at systematizing the machine tool industry.

Japan's machinery industry, especially the machine tool industry, was one of the most backward segments of industry, and its weakness was betrayed under war structure. The production of machine tools was possible, but large-sized machine tools to manufacture these implements were used only by military arsenals or a few gigantic enterprises. To strengthen and expand the foundation of machinery industries, many light industry plants were converted to subcontract for machinery manufacturers. But the desired purpose was not fulfilled.

Another characteristic of the reorganization and consolidation of small and medium enterprises during wartime was the driving out of wholesale dealers by industrial associations. This was done forcibly under the powerful pressure of a wartime economy, and wholesale dealers are still unable to revive their proper functions today.

4. *Postwar Small Industry Problems*

In August 1945, World War II ended with the surrender of Japan. The wars that had lasted for more than eight years since 1937 exhausted and destroyed the Japanese economy to a considerable degree. The first to wriggle out of the war ruins and resume production, however, were small industries. They concentrated on the production of daily necessities and sundry goods, while monopolistic large enterprises were hesitating to start production.

In the chaotic period immediately after the war defeat, a full-fledged resumption of industrial production was hopeless, and the production of consumer goods was done mainly by small enterprises. To make matters worse, the Japanese economy as a whole began to slow down its production tempo after September 1946 and assumed the aspect of a contraction of production. The direct cause of these phenomena was the lack of raw materials, electricity and coal, and inflationary trends as well as the rampancy of blackmarketeers also delayed the resumption of industrial production.

To cope with this situation, the government introduced the Enterprise Reconstruction and Reorganization Law in October 1946 to open the way for the fostering of larger enterprises. In reviving industrial activities, the priority production system was adopted to funnel state funds principally into coal and steel industries, raw materials as well as capital were provided with first priority to large enterprises, and the accumulation of capital was precipitated by inflationary policies. In this process of industrial rehabilitation, income taxes were levied on those small and ultra-small enterprises on which income tax was not imposed in prewar days. In other words, small industries were groaning under discriminatory heavy tax, while their importance in the Japanese economy was realized.

Notwithstanding these efforts, however, the nation's mining and

manufacturing production barely recovered to 54.6 per cent of its prewar level by 1948. The production increase was buttressed by such unstable props as deficit finance and U.S. economic assistance, and the incessant inflation resulted in the currency instability.

It was at this juncture that the U.S. policies towards Japan were revised drastically. In December 1948, the U.S. Administration issued a nine-point directive on the stabilization of the Japanese economy, and the deflationary "Dodge-Line" policy had been carried out between April 1949 and June 1950, shortly before the outbreak of the Korean Incident.

Under the Dodge-Line policy, the state budget was rigidly balanced, deficit finance was ended, a huge sum of subsidies for resumption of industrial production and deficit-covering financing were stopped. The tight-money policy dealt a severe blow to industry circles, but it was small enterprises which bore the brunt of it. The economy ran into depression, large capitalists lorded it over smaller enterprises, and those small businesses which were manufacturing substitute articles right after the war's end went out of business one after another. Strict collection of tax, arrears of subcontract money, setback in demand, and money-lending difficulties drove smaller industries into a corner by March 1950.

In June 1950, the Korean Incident took place. It put an end to the business stagnation and generated an economic boom, though its period was not so long. Benefitted by the short-lived bonanza, small industries buzzed, and after the armistice in Korea, both production and exports slackened again.

In 1953, production and commodity prices went up, but the bulging imports and inventories aggravated the international balance of payments. From the autumn of 1953, the government carried out tight-financing policies, under which smaller enterprises increasingly felt the pinch of hard times. As the centralization of economic strength progressed, small and medium enterprises were harassed by internecine competition among themselves, and the need of measures for stabilization of their businesses came to be felt acutely.

In 1955, the Japanese economy was lively, supported by economic buoyancy abroad. The following year saw the economy continue to expand, and it was called the best of the postwar years. In 1957, however, the Bank of Japan raised the official discount rate to apply the brake on economic activities.

In all these years, small industries also shared the economic prosperity, and their business conditions improved considerably. The increasing number of dishonored small bills reflected the fact that petty enterprises were still in straitened circumstances. Generally, the disparity between large and small-medium enterprises widened, and petty enterprises in particular were lagging. Perplexing problems in petty enterprises came to a head, and labor and social security problems in small and medium enterprises came to be taken up. Leaders of small and medium enterprises, on their part, began to show keen interest in improvement of management.

Now the measures that the government has taken in postwar years for small and medium enterprises will be introduced.

## 4. Countermeasures for Smaller Industries

As outlined so far, smaller industries occupy an important position in Japan's national economic activities to play a significant with major enterprises in point of productivity as well as the wages they can afford to pay, to constitute what is known as the dual structure of the national economy.

It is due in part to the way Japan's national economy and industrial enterprises have developed since the beginning of the Meiji Era (1868-1912) that such dual economic structure has come into existence. It is, however, also due to various kinds of inconsistency that are innate in the management of these smaller industries. To leave smaller industries as they stand today would be tantamount to leaving obstacles in the way of stabilized future growth of Japan's industrial structure which is bound to be supported at a higher plane.

It is in the face of such a situation that the Japanese Government, in 1948, organized the Smaller Enterprise Agency to deal exclusively with problems pertaining to small and medium sized industries.

This agency has exercised much effort toward the organization of smaller enterprises, constitutional improvement, better financing, and modernization of their business management. At the same time, efforts were also made to seek an amicable solution to problems in the related industries in order to improve the "economic surroundings" of smaller enterprises.

A peculiar situation in Japan is that such efforts sometimes deal specially with problems affecting the smaller industrial enterprises, but generally speaking, smaller commercial enterprises are also included when they speak of countermeasures to cope with the smaller enterprises.

In the present article, however, such countermeasures having special significance to the smaller industrial enterprises are to be taken up as main subject for study.

### 1. Organization of Smaller Enterprises

The system of promoting industrial unions, which comes first in the better organization of smaller enterprises, dates back to the early days of the Meiji Era or to the closing period of the last century. Nevertheless, it has made a new start after World War II, along with the fundamental change of political and economic structures.

The organization of smaller enterprises is pushed by two legislative

measures. One is the "Smaller Industries, etc. Cooperative Association Law" and the other is the "Law Concerning the Organization of Smaller Industries. The former deals with the cooperatives while the latter concerns the Commerce and Industry Cooperative system.

The cooperative system aims at the promotion of strong union among smaller industrial enterprisers, in order to enlarge the unit of their industrial activities through mutual cooperation to the extent that individual enterprisers cannot attain on their own; it is designed that these enterprisers will become able to carry out business readjustment on a larger scale, or acquire better terms in business transactions on an equal footing with major enterprises, on the strength of their combination.

On the other hand, the commerce and industry cooperatives aim at the elimination of excessive competition among the fellow entrepreneuers through their joint efforts. It will be recalled that there are cases in Japan in which a large number of small enterprisers, whose individual financial position is none too strong, is engaged in a same line of business. Then they inevitably begin competing with each other at the sacrifice of their common interests. With such competition eliminated, they will be able to run business under better, stabilized conditions.

The organization of smaller enterprises with such aims and intentions is designed to pave the way toward modernization of smaller business. It should therefore be the starting point of any countermeasure to deal with problems affecting the smaller enterprises.

## 2. Organization by Means of Small Industries Cooperative System

The Smaller Industries, etc. Cooperative Association Law was enacted in 1949, and it has been revised by a series of 11 amendments.

As of the end of May, 1960 there were 25,122 Common Facilities Cooperatives, 10, Minor Common Facilities Cooperatives, 33 Fire Mutual Aid Cooperatives, 462 Credit Cooperatives (including one Federation of Cooperatives), 279 Federations of Cooperatives, and 10,513 Joint Enterprise Cooperatives or a total of 36,420 cooperatives, organized according to the Smaller Industries, etc. Cooperative Associations Law.

The Common Facilities Cooperatives are made up of smaller entrepreneurs. As a rule, they are industrial undertakings employing less than 300 persons inclusive, and commercial or service undertakings employing less than 30 persons inclusive. These cooperatives are to carry out such undertakings as production, processing, marketing, stocking, transportation, safety maintenance, acquirement of operation funds, education, intelligence service and other joint undertakings that any member entrepreneurs cannot carry out individually; and such undertakings are carried out with cooperative's joint investments. It is designed that member entrepreneurs will become able to run their business on a larger scale, to carry out business readjustments, and to acquire business terms equal to those of major enterprises by taking cooperative actions.

The Federation of Common Facilities Cooperatives undertakes enterprises which individual cooperatives are unable to carry out on their own, thereby contributing to improvement of the business of its member cooperatives.

These two types of organizations constitute the nucleus of the Government efforts to organize smaller enterprises, since they are the most representative form of unions promoted by virtue of the Smaller Industries, etc. Cooperative Association Law.

Next, there are the Minor Common Facilities Cooperatives, which are made up of still smaller entrepreneurs who depend mainly upon their own manual work. As a rule, the number of their employees is not more than five persons in the case of industrial undertakings, and also the number is not more than two persons in the case of commercial and service undertakings. These "minor" cooperatives also carry out joint enterprises just in case of regular cooperatives by means of members' joint investments.

The third is the Fire Mutual Aid Cooperatives which aims at undertaking mutual aid enterprises to help members in the spirit of comradeship, especially on occasions of fire damage to their property, thereby helping promote the welfare of fellow entrepreneurs.

There are two types of Fire Mutual Aid Cooperatives. One is open to all the local smaller entrepreneurs for its membership with a prefecture as a unit (one unit for Hokkaido, Tokyo Metropolis and Kyoto and Osaka Prefectures with the exception of those engaged in agricultural, forestry and maritime (fishing) industries. The other is a cooperative union for one kind of enterprise with Japan as a whole as a unit for its membership. Incidentally, most of prefectural governments have a special budget to compensate their local Fire Mutual Aid Cooperatives for their disbursements.

The fourth is the Credit Cooperatives which are organized by joint investments by more than 300 members who are either smaller entrepreneurs or working men. With the capital thus raised, the cooperative will advance loans to its members, discount their bills, accept deposits or savings of its members, and carry out various other enterprises that a financing organ would undertake, in an effort to augment the economic position of its members.

The fifth is the Joint Enterprise Cooperatives which constitute a unique form of cooperative organization. For one thing, the members pool their capital as well as manual labor with the union; they give up their independence as individual entrepreneurs; the union itself constitutes one body to carry out its enterprises. As a result, each member of a Joint Enterprise Cooperative not only participate in the management of the union's enterprises but also takes part in the operation thereof, thus to receive remuneration as if he were a salaried man in the employ of the cooperative.

### 3. Organization by Means of Commerce and Industry Cooperatives

The Commerce and Industry Cooperative as a system aims at elimination of excessive competition among smaller industrial enterprises to facilitate the stabilibation of their business. They are organized under the Law Concerning the Organization of the Smaller Enterprises, which was put into practice in April 1958.

Already in 1953, however, the Smaller Enterprises Stabilization Law was enacted to promote "readjustment unions" in order to eliminate excessive competition among smaller enterprises, thereby to stabilize their business. These unions accomplished much in improving business.

It so happens, however, that the 1953 law recognized the organization of such readjustment organs only among the smaller industrial enterprises; it did not recognize the promotion of a joint economic enterprise. If a number of entrepreneurs were to promote a joint economic enterprise, therefore, they had to have a new legislative measure to legalize such activities. The readjustment union system, consequently, was subjected to re-examination, it eventually leading to the establishment of new commerce and industry Cooperatives by virtue of the Law Concerning the Organization of the Smaller Industries of 1958.

A Commerce and Industry Cooperative may be organized by any specific line of business provided that there prevails such a situation as to necessitate the formation of such a body e.g., an excessive competition among the fellow entrepreneurs which hampers a smooth progress of business transactions, threatening the stability of many entrepreneurs' businesses.

It is conditional, however, for the promotion of such a commercial and industrial cooperative, that more than one-half of the total number of the fellow entrepreneurs become affiliated with the cooperative, and that more than two-thirds of the membership is comprised of smaller enterprises.

Such restrictions have been introduced into the establishment of the commerce and industry cooperatives because the enterprises that such a cooperative will carry out inevitably produce a significant effect upon not only the welfare of other fellow entrepreneurs but also upon the general public as well as those engaged in related enterprises.

The primary objective of a commerce and industry cooperative is to carry out business readjustments, such as quantitative restrictions on production, restrictions pertaining to the methods of marketing, restrictions on selling prices, restrictions on the productive equipment and other measures designed to eliminate excessive competition.

In addition, these cooperatives may carry out joint enterprises similar to those undertaken by Common Facility Cooperatives.

Up to the end of June 1960, a total of 569 commerce and industry cooperatives were organized, this number including 23 federations of these cooperatives.

## 4. Measures for Encouragement of Formation of Cooperatives

There is no room for argument as regards the necessity of organizing smaller enterprises. Nevertheless, there are a number of unorganized smaller enterprises for various reasons. Outstanding among such reasons is the absence of the spirit of cooperation among the entrepreneurs concerned, due largely to differences in their subjective interpretation of the general business outlook. It then becomes necessary to do some enlightenment campaign in order to create the atmosphere of cooperation among the entrepreneurs concerned, so that they may be organized into cooperatives.

Among the Government measures put into practice for the purpose of facilitating the organization of smaller enterprises are:

*a) Guidance of Cooperatives:* The establishment and popularization of cooperatives show a satisfactory progress on the whole. However, there are some cooperatives which are not properly functioning to realize their primary objectives. The Smaller Enterprise Agency, consequently, has distributed various printed matters to guide the management of various types of cooperatives. And, with the cooperation of such government offices as the International Trade and Industry Bureaus and prefectural government offices (which are in a position to supervise the activities of cooperatives), the Agency has approached various cooperatives to give them guidance. At the same time, what is known as the consultation system was inaugurated to make an analysis of their enterprises to point out whatever defects in management, as well as to advise measures of improvement, thereby contributing to the qualitative betterment of cooperative activities.

Among other guidance activities is the holding of lecture meetings by cooperative officials and staff members for their adult education, with the cooperation of local prefectural governments.

*b) Advance of Loans to Cooperatives, etc. for Establishment of Joint Facilities:* Cooperatives find it necessary to own joint facilities to carry out such enterprises as production, processing, inspection of products, safe maintenance, transportation and so forth. The operation of these joint facilities constitutes the nucleus of cooperative activities.

The Government earmarks appropriations to give subsidies to the establishment of such joint facilities and cover part of such disbursements on the part of the cooperatives. The history of this subsidy system is rather old. In 1956, however, some amendments were incorporated into the system to draft a new law called the Smaller Enterprises Promotion Capital Subsidy Law. As the result, this system has since been operated in compliance with this law.

According to the foregoing subsidy law, prefectural governments have come to appropriate special budgets to advance loans to the cooperatives of smaller enterprises to finance their establishment of joint facilities, and also later, to facilitate the modernization of their facilities. As the prefectural governments transfer part of their budgets

from ordinary accounts to special accounts, the central government will grant subsidies to the prefectural governments concerned up to the limit of an identical amount thus transferred. Then the prefectural government will use both its own special account funds and the subsidies obtained from the central government for financing of loans to smaller enterprises as well as their cooperatives.

Such loans of the prefectural governments to smaller enterprises and their organizations are carried out mainly under the following conditions: (1) the loans are advanced up to one half of the total amount of capital required for the establishment of the projected facilities; (2) no interest is payable on these loans; the repayment is carried out either by the annual installment basis or the semi-annual installment basis, beginning in the second year to complete the payment within four years thereafter, at an even rate.

*c) Reinforcement of Financial Position:* In view of the fact that the financial position of cooperatives of smaller enterprises is not strong because of their insufficient capital accumulation, there are many instances in which they find it desirable to obtain loans, in executing their joint undertakings related to production, processing, stocking and marketing; there are also instances wherein these organs of smaller enterprises must obtain joint loans on behalf of their members, or when they want to advance loans to their members on their own account. This is very important for them in view of the fact that smaller entrepreneurs are almost always short of funds.

It is for the purpose of taking care of such needs systematically that the Central Bank of Commercial and Industrial Cooperatives has been promoted, with joint investments by the Government and the affiliated cooperatives, to advance both long-term and short-term loans to the cooperatives.

In addition, there are the Smaller Enterprises Credit Guarantee Corporation and the Smaller Enterprises Finance Bank which give priority to the requirements of smaller enterprise cooperatives.

*d) Tax Exemption or Reduction for Cooperatives:* The Government takes various special tax measures to foster the growth of the cooperatives of smaller enterprises.

### 5. Guidance and Assistance to Central Council for Small Business Cooperatives

There are the Central Council for Small Business Cooperative functioning as an organ for giving guidance and assistance to the cooperatives. In Tokyo, there is the Central Council of all-Japan Small Business Cooperatives while in each prefecture there is the Prefectural Central Council for Local Small Business Cooperative.

These central councils render guidance to various cooperatives, give information and conduct surveys.

Meanwhile the central government gives guidance to these central councils in order that they will function properly to give full display to their primary purposes. Furthermore the central government grants subsidies to these central councils to finance their activities such as the dispatching of central instructors to various cooperatives, the activities of cooperative leaders, and the holding of lecture meetings.

## II.

## Structural Improvement of Smaller Enterprises

In regard to the present activities of smaller industries, it is generally said that there are some defects in their business management and also that their production techniques are inferior to those of larger enterprises. It is a fact, however, that even smaller enterprises must always endeavor to improve their business management and production techniques, in order to survive severe competition that is always the order of the economic world at any time and at any place.

Meanwhile the Government must take steps to improve the backward management of smaller industries in an effort to expedite the growth of the national economy as a whole. It must encourage the structural improvement of smaller industries by helping industrial modernization. There are three channels through which such assistance can be given, viz., (1) the consultation system for smaller enterprises, (2) guidance in technical improvement, and (3) modernization of production facilities.

### 1. Smaller Enterprises Consultation System

The importance of scientific business management is beginning to be recognized in Japan's commercial and industrial circles. Such a trend has been fostered after the postwar competition which has been intensified by the adoption of modern facilities in sequence to the worldwide technical innovation.

The scientific business management is something which must be adopted not only by major enterprises but also by smaller industries in a manner becoming to them.

In the present-day business management of smaller industries, however, there are still many remnants of "pre-modern" traits, and they constitute a factor which accounts for various difficulties that smaller enterprises are confronted with at present.

The smaller enterprises consultation system has been introduced with the object of doing away with the afore-mentioned "pre-modern" traits

found in the management of these smaller enterprises. Actually, such public organizations as prefectural governments and the "big five" cities assign technical experts to inspect the management of smaller enterprises, analyze whatever questions at issue, advice measures for improvement of the situation, and also give guidance in putting such advices into practice. The experts are known as "shindan-in" or smaller enterprise consultants.

As regards the kinds of consultation undertaken, they are:

*(1) Individual Consultation:* This system was put into practice in 1948, centering around individual factories and commercial stores. Mining enterprises were also added. These "individual consultations" have been carried out upon the request of individual enterprises; the consultants are sent into the enterprises to look into their financial conditions, production, marketing, and inventories, as well as the top management of the said enterprises as they stand. Just in case the entrepreneur desires consultations for any specific department of his enterprise, the consultation is limited to the department concerned—as it is called the departmental consultation. After the diagnosis, managerial defects, if any, are analyzed and advisable remedies are offered.

This system is effective in propagating the knowledge of scientific management and thereby facilitating the modernization of the specific enterprise concerned. And this is the kernel of the consultation system.

*(2) Collective Consultation:* After the individual consultation system was put into practice for some time, it was found that individual consultation was not sufficient in some cases to bring about a general improvement in an enterprise as a whole. In view of the fact that smaller enterprises are in a disadvantageous financial position as compared with larger enterprises, it becomes necessary that the surrounding conditions in general should be better organized so that efforts for improving any individual enterprise may attain the desired outcome. It is in consideration of such circumstances that the system of collective consultation has come into effect. This system will take up any specific enterprise as a whole collectively, to find a common defect in management and to work out plans for general improvement of the enterprise as a whole through the improvement of the surrounding conditions.

In the case of collective consultations, a specific name is given to the system according to each individual kind of enterprise taken up as the object of consultation.

*Consultation of Shopping Center:* The whole bloc of a shopping center is taken up as the object of consultation to study the local economic geographical conditions, the manner and facilities of attracting prospective customers, and also the techniques of marketing. As a result of such studies, an all-round selling capacity of the center as a whole is analyzed in order to work out a plan to enhance the utility value of the specific shopping center. In case a defect in management common to all the stores constituting the shopping center is found, some remedial measures will be advised to improve the management of the

center as a whole.

*Survey of Vertical Connection System:* Many of smaller industrial enterprises are operated as subcontractors for larger enterprises. Any improvement of business of such smaller enterprises may only be considered in relation to the manner of their affiliation with the larger enterprise concerned. Regardless of how commendably smaller enterprises are managed, if the orders (contracts) awarded by larger enterprises frequently fluctuate quantitatively, or if smaller enterprises are obliged to operate at the sacrifice of their costs, the subcontractors must of necessity run their business in precarious conditions.

In the survey of this vertical connection system, therefore, primary efforts will be directed toward analyses of such relationships, e.g., large enterprises' dependency upon these subcontractors, and the preparedness on the part of the subcontractors to accept such orders, in the light of the effects of such relationship upon the business welfare of both large and subcontract enterprises.

With the special features and defects of such relationships between large and small enterprises made clear, consultants may work out measures for improvement affecting the manner of transactions between them, the alleviation of subcontractors' difficultis in securing finance and raw materials, and promotion of closer cooperation between the two parties concerned, thereby readjusting the relationship between them.

With the remarkable technical progress in recent years, along with the prospects of liberalization of foreign trade, indications are that a substantial change is taking place in the relationship between the larger enterprises and smaller subcontractors. Incidentally, the importance of this consultation system for their vertical connection has been enhanced.

*Survey of Production Centers:* There are the smaller enterprises which have developed as a group in certain specific areas under special historic or geographical circumstances. They are collectively known as "production center" group. Such group of producers, as well as producers of related industries, enhance their efficiency of production and distribution by being concentrated in one locality, and they have come to establish special relationships with their markets. These smaller manufacturers as a group have been able to find a solution to their problems that as individual entrepreneurs they might not have been able to solve. So the very fact that they are banded together in one locality is the essential factor which has precipitated their economic activities.

In the case of these production centers, it is important that each individual enterprise will improve its own condition of business management, but it is all the more important that they as a group will take advantage of their collective activities to promote local business as a whole.

In the consultation of production centers, therefore, consultants will first of all grasp the specific features of the given specific locality as well as questions at issue, and as the result, the all-round study of the outstanding situation.

The consultants will then learn what is the target of the business readjustment of individual enterprises that collectively constitute the production center, so that they may become able to advise the manufacturers as regards the selection of specific items of products, betterment of the existing method of business transactions, expansion of the market, solution of financial difficulties, and promotion of better cooperation among fellow entrepreneurs.

The consultants will aim at improvement not only of the economic activities of the locality as a whole but also of the related factors which have direct bearings upon the general welfare of the specific locality.

With the recent betterment of the means of communications and traffic, along with the change in the taste of end-users, the so-called production centers show a tendency, to lose the peculiar advantageous position they used to enjoy. There are, consequently, some production centers which are in need of finding a way out of the stagnation. Hence the survey of the production centers as a whole by some local public organizations.

*General Consultation Classified by Specific Enterprises:* It has been reiterated already that it is of greater importance to bring about the readjustment of surrounding factors than to help improve any specific individual enterprises. Such a need is specially pronounced in the survey of production centers. Even in this case, however, the object of survey is limited to a certain specific area or a given specific products. So the survey of any production center is found to be still inadequate to serve the major purpose of readjustments of surrounding economic factors affecting any given industry.

In the general survey of smaller enterprises as classified according to individual lines of business, the object of the study is enlarged to the whole of this specific industry, to study problems of the said industry in relation to other related industries as well as the market situation, so that counter-measures of general improvement of this specific industry or the readjustment of the related industries may be worked out, in point of production and distribution of products.

*Consultation of Cooperatives:* The survey of cooperatives (including common facility cooperatives, federation of common facility cooperatives, and joint enterprise cooperatives) is different in form from any of the individual survey or collective survey mentioned so far.

As it was previously mentioned, the organization of smaller enterprises in the form of cooperatives is of primary importance for the promotion of smaller enterprises. At present, however, these cooperatives are not always functioning properly due to insufficiency of knowledge and experience on the part of men who run them. Here comes in the consultation of cooperatives to study the outstanding state of affairs of any specific cooperative as well as whatever questions at issue, in relation to the economic conditions affecting the cooperative and its individual members. The consultants will then advise the cooperative and its members as regards the organization, accounting, and the enterprises

operated by the cooperative, so that the fine effects of organization may be fully realized.

In view of the fact that the consultation is carried out on a specific organism called a union, it is different from the collective consultation, but it cannot be included in the individual consultation because the consultation affects the entire membership which constitutes the cooperative. It is thus a specific form of survey of its own.

These consultations are undertaken mainly by prefectural governments and the municipalities of the "Big Five" cities. But the central government sometimes carries it out under its direct management when the survey covers a wide arae, notably on such occasions as the survey of a specific smaller enterprise as a whole on the national scale.

The enterprise consultations carried out up to the fiscal 1959-60 were as follows: factory consultation, 31,857 cases; commercial stores consultation, 69,599 cases; shopping center consultation, 4,605 cases. system affiliation relationships) consultation, 109 cases; production centers consultation, 453 cases; cooperative consultation, 1,938 cases, mining enterprises consultation, 377 cases; general consultation of enterprises classified according to a kind of business, 11 cases.

The central government, since 1950, has granted subsidies to prefectural governments and the governments of the Big Five cities to cover part of the expenses required for the undertaking of these consultations, as these public organizations appropriated the budget thereof to an equal amount corresponding to the subsidies obtained from the central government. These consultations cost nothing to the enterprises which had applied for the consultations. The appropriations of the central government in the form of subsidies to local governments amounted to ¥707 million up to fiscal 1960-61.

The consultation of smaller enterprises, especially that of individual enterprises, represents a special work that requires profound expert knowledge of all the phases of any specific enterprise concerned. Furthermore, the success of such a consultation depends largely upon the qualification of the person(s) who carries out the actual consultation.

In view of the foregoing importance of the qualification of consultants, regulations pertaining to the system of registration of consultants were promulgated in 1952, in order to have the names of capable consultants registered with the central government. As of April, 1960 there were 4,939 persons registered as qualified consultants of smaller industrial and commercial enterprises.

## 2. Guidance in Production Techniques

Along with the general improvement of production techniques in recent years, a remarkable change is noted in the variety of products, selection of raw materials, the method of production, and the scale of productive equipment, leading to the expansion of the scale of production

and also to the reinforcement of business connections among enterprises. Such a strengthening of the technological foundation of business, however, has been carried out mainly among major enterprises. Most of the smaller enterprises remain unimproved. The result is inevitably a significant difference now seen in the standards of production techniques between major and smaller enterprises. What is specially important about such a development is that the smaller enterprises that depend upon the promotion of exports are becoming backward in point of the international criterion of production techniques.

In the face of such a bleak outlook, it is now considered a matter of urgent importance for Japan's smaller enterprises to introduce some structural improvement. And it requires better financing, modernization of their production equipment, and elevation of their standards of production techniques in order that smaller enterprises may keep abreast of the international progress.

It is a cold fact, however, that smaller enterprises are short of funds and that they cannot afford to maintain a staff of many technical experts. It means that they are unable to carry out such improvement programs all by themselves. Hence the need of help from the central or local governments, in addition to that from larger enterprises with which they are affiliated, for the introduction of higher standards of production techniques.

It is with a view to dealing with such requirements that the central government has enacted legislative measures to advance loans to smaller industrial enterprises to finance modernization of their productive equipment.

Furthermore the Government grants subsidies to various local public experiment and research institutions to modernize their equipment and also to facilitate their research work, so that these institutions in turn will give technical aid to local smaller industrial enterprises in connection with their modernization of machines and equipment and improvement of their production techniques. Such subsidies are known as technical research funds for the promotion of exports by smaller industrial enterprises, and also the funds for encouragement of trial manufacture with a view to the promotion of exports by smaller industrial enterprises.

These institutions also establish special courses for smaller industrial enterprises to popularize new and higher standards of modern and rationalized production techniques, holding such courses classified by specific lines of industries; they publish pamphlets designed to give instructions on new production techniques, or sponsor contests of new designs, or exhibitions of new products, as well as contests for various fundamental production techniques.

Such enlightenment efforts have so far proved satisfactory with some tangible achievements attained. Such efforts will be continued in the future, too.

### 3. Modernization of Facilities

It is generally recognized that smaller enterprises are in urgent need of industrial modernization to raise efficiency and replace superannuated facilities with modern machines and equipment.

A recent survey concerning their productivity finds that the index of value added of factories employing from 50 to 99 persons is 45.5 per cent against 100 for major enterprises employing not less than 1,000 men.

As for the productive equipment, up to 60 per cent of mechanical machines and equipment of smaller enterprises is older than 10 years.

Government subsidies are one of the measures to encourage industrial modernization. This measure is legalized. There are also special tax measures including the special redemption system on the mechanical equipment of smaller industrial enterprises.

*a) System for Industrial Modernization Loans*—The system of advancing loans via official channels to facilitate the modernization of industrial facilities in smaller enterprises has been in practice since 1954 under the joint auspices of the central and prefectural governments. In 1951, this system was expanded to apply it on a larger scale in a more effective way through the enactment of a law for financial assistance to the development of smaller enterprises. (As regards the operation of this legislative measure, the reader will refer to (b) Advance of Loans to Cooperatives, etc. for Establishment of Joint Facilities, of (3) Measures of Encouragement for Cooperatives, of Section 1. Organization of Smaller Enterprises.) The modernization funds advanced under this legislative measure amounted to ¥7,780 million up to fiscal 1960-61. Loans advanced up to the fiscal 1959-60 amounted to ¥6,433 million, the number of smaller enterprises involved amounting to 10,267.

*b) Special Tax Redemption for Smaller Enterprises*—In the Japanese taxation system, the period of redemption on mechanical equipment is generally longer than what is observed abroad. To readjust various inconveniences arising from this system, a special redemption system came to apply to smaller industrial enterprises since 1951. As regards the redemption of specifically designated industrial facilities, an advance redemption by 50 per cent of a period of the first three years is recognized. This measure was intended to facilitate the acquirement by the smaller entrepreneurs of desired equipment through tax manipulations, thereby helping them to modernize their machines and equipment.

In the original legislative measure, however, the designated machines and equipment were of the kind and capacity that could be operated by major enterprises; they were the kind that the smaller entreprneurs could hardly afford to obtain. In and after 1957, therefore, this legislative measure was amended so that the machines and equipment that smaller enterprises could afford to obtain came to be designated as objects of special redemption.

# III.

## Financing of Smaller Enterprises

The financing of smaller enterprises seems to be the focal point of the whole problems. It is because smaller enterprises must in most cases obtain funds from financial organs, instead of through such means as a capital increase or floatation of debentures, due to their inability to raise funds by these latter means. On the other hand, city banks in general are reluctant to advance loans to smaller enterprises unless they are convinced of the safety of such investments. This is but natural because the banks are also profit-seeking enterprises. Under such circumstances, the ability of smaller enterprises to raise funds inevitably becomes limited. For one thing, their economic and social position is none too reassuring. Moreover, their credit is not very high, and they do not have much to offer as collateral.

Difficulties in the business management of smaller enterprises can thus be focused on fund-raising difficulties.

Hence the Government (1) encourages city banks to extend more positive financial assistance to smaller enterprises, (2) establishes financial organs with Government funds to funnel loans into smaller enterprises, and (3) readjusts the business management of smaller enterprises in such a manner that financiers may feel safe in advancing loans to them.

### 1. More Loans to Small Enterprises

It is important that smaller enterprises will be assisted in such a manner that they would be able to obtain loans from financial organs in general whenever they are in need of such financing. To this end, it would be necessary to furnish financial organs with more financial resources with which they may finance smaller enterprises, and to make financial institutions feel willing to finance smaller enterprises.

One of the measures that the Government can carry out in connection with the afore-mentioned need is to set up a Government-run financial organ to specialize in the financing of smaller enterprises. (This question will be dealt with later.) In addition, there are the following measures:

*1) Use of Government Investments and Loans*—What is meant by the Government investment and loans is the employment of Government funds in furnishing private enterprises with industrial funds, to invest or advance loans to the Government-operated enterprises, and underwriting of bonds issued by local governments. The said Government funds consist of the surplus that belongs to the general account in the state budget, the special account for funds of industrial invest-

ments or loans and funds raised from the non-governmental circles such as postal life insurance funds and postal savings funds.

As a matter of fact, the Government carries out the financing of smaller enterprises in the form of advancing loans to such institutions as the People's Finance Corporation, the Smaller Enterprises Finance Bank, the Central Bank for Commercial and Industrial Cooperatives, and the Smaller Business Credit Guarantee Corporation, by utilizing Government funds. Moreover the Government underwrites debentures issued by the Central Bank for Commercial and Industrial Cooperatives.

**Government Investments and Loans to Finance Banks for Small Businesses**

*(Unit: ¥100 million)*

| Fiscal Year | People's Finance Corp. | | | Smaller Enterprises Finance Bank | | | Central Bank for Commercial & Industrial Cooperatives | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Investments | Loans | Total | Investments | Loans | Total | Investments | Bonds | Loans | Total |
| 1955—56..... | 5 | 105 | 110 | 5 | 115 | 120 | 10* | 4 | 0 | 14 |
| 1956—57..... | 0 | 140 | 140 | 0 | 155 | 155 | 0 | 0 | 19 | 19 |
| 1957—58..... | 0 | 270 | 270 | 0 | 300 | 300 | 15** | 70 | 0 | 85 |
| 1958—59..... | 0 | 255 | 255 | 0 | 295 | 295 | 0 | 51 | 0 | 51 |
| 1959—60..... | 0 | 250 | 250 | 0 | 275 | 275 | 12** | 20 | 0 | 32 |

* General Account. ** Industrial Investment Account.

*2) Measures to Encourage City Banks to Finance Smaller Industries*

A balance sheet of financing to the smaller enterprises by all the financial organs inclusive of those which operate with the Government funds finds that up to 90 per cent of the total loans was advanced by city banks. It is thus found that city banks occupy an overwhelmingly important position in the financing of the smaller enterprises, in point of the amount of money involved. It means that the fluctuations in the amount of financial accommodations given by these city banks have direct bearing upon the financial conditions of these smaller enterprises.

It is assumed, in the face of the foregoing situation, that the smooth financing depends much upon the encouragement of these city banks to accommodate these smaller enterprises.

The Government is well aware of this fact, while the city banks are also willing to cooperate with the government policy to help out the smaller enterprises.

It is under such circumstances that the Government takes special measures of encouragement in behalf of city financial organs to facilitate their advancing of loans to the smaller enterprises. Included among these are: (1) Special consideration on taxation upon city financial organs' reserves to cover the risks of bad loans in connection with their financial accommodations to the smaller enterprises; (2) the establishment of "special stores for financing of the smaller enterprises" by metropolitan banks; (3) the fostering and strengthening of financial organs specializing in the financing of the smaller enterprises, such as

the mutual aids banks, credit banks, and credit associations.

*3) Local Public Institutions' Measures for Smaller Enterprises*

Generally speaking, the smaller enterprises are endowed with the characteristics of being local enterprises. The local public institutions, consequently, have worked out various measures to mitigate the financial difficulties the smaller enterprises, along the line advocated by the central government. Among the direct measures designed to alleviate the financial difficulties of smaller enterprises is the following: the local public institutions deposit their financial funds with some specific financial organs, so that the latter will finance the smaller enterprises to the extent of several times more than the deposited funds of these local public institutions.

## 2. Rationalization and Strengthening of Governmental Financial Organizations Specially for Smaller Industries

In order to facilitate financing for medium and small enterprises, it is necessary to supplement, based on the actual state of such enterprises, quality-wise as well as quantity-wise, the funds financed by municipal financial organizations for such smaller industries. For this purpose, the rationalization and strengthening of governmental financial organization are planned. There have been established the People's Finance Corporation, which extends loans to petty enteprisers who are unable to obtain financial assistance from city financial organizations, and the Smaller Enterprise Finance Bank, which specializes in providing smaller enterprises with long term loans which ordinary financial organizations cannot provide.

The existence of governmental financial organizations is significant in the following respects:

(1) Funds are supplemented quantity-wise.

(2) Funds are supplemented quality-wise.

(3) Funds are supplied at low interest rates.

The People's Finance Corporation and the Small Enterprise Finance Bank are mainly to accomplish the function (2) above.

Furthermore, there is, along with the two financial facilities mentioned above, the Central Bank for Commercial and Industrial Cooperatives, which is a semi-governmental organization operated for the cooperatives of smaller industries.

(1) The People's Finance Corporation: This Corporation was established in 1949 in accordance with the "People's Finance Corporation Law". The characteristics of this finance corporation are as follows: (a) The entire amount of funds is financed by the Government; (b) Capital is to be supplied by the Government only; (c) The competent Minister is involved in the appointment of directors; (d) In the ap-

plication of penal provisions, the same provisions set forth for public service personnel are adopted; (e) Business methods and plans and financing plans must be approved and directed by the competent Minister; (f) Budget and balance sheet of accounts are submitted to the Diet; (g) Profits go to the National Treasury.

As of the end of March 1959, the total capital was ¥20,000 million, the balance of governmental loans ¥78,900 million and the balance of credits ¥106,800 million. Maximum possible loan is ¥200,000 for individuals and ¥500,000 for corporations, but for special businesses, the sum may be raised to as high as ¥1 million ¥2 million. The period of loan is less than five years, interest rate is 9.0 per cent per annum and repayment is to be made in instalments.

(2) Smaller Enterprise Finance Bank: This bank is a governmental organization established in 1948 in accordance with the "Smaller Enterprise Finance Bank Law." It is the same as the People's Finance Corporation in nature. But this bank is for comparatively higher layers of the smaller industries, in contrast to the People's Finance Corporation, which handles financing for petty enterprises.

Loans may be extended to companies and individuals whose capital does not exceed ¥10 million or whose employees are not more than 300 (30 for commerce and service business and 1,000 for mines) and they must be those who operate special business designated by Government ordinances (20 at present) or cooperatives of smaller industries such as the smaller industries cooperatives, commercial and industrial cooperatives, etc. There is a condition that the loans will be used for equipment and long term operational funds only. Period of loans is as a rule one year to five years, interest rate is 9.0 per cent per annum and repayment is to be made in instalments. Maximum loan is ¥10 million (¥30 million in special cases). In the methods of loaning, there are "direct loans" performed by the main and branch offices (12 offices) of the Finance Bank and "agent loans" in which ordinary financial organizations act as its agents, and the number of such agents is 626.

As of the end of March 1959, the capital was approximately ¥24,100 million, the balance of governmental loans was ¥100,300 million. The balance of loans handled by agents as of the end of March 1959 was 78,238 cases, amounting to ¥109,800 million and that of direct loans was 3,154 cases, amounting to ¥21,100 million, bringing the total to 81,392 cases valued at ¥130,900 million.

(3) The Central Bank for Commercial and Industrial Cooperatives: This bank was established in 1936 in accordance with the "Commercial and Industrial Cooperatives Central Bank Law" as a financial institution for cooperatives comprising such medium and small enterprses as the smaller industries cooperatives, and commercial and industrial cooperatives. This is a semi-governmental organization and, of the present capital of ¥6,600 million, of which ¥3,700 million is financed by the government and the rest, ¥2,900 million is financed by the cooperatives.

This bank is aimed at financially facilitating the organization of

the smaller industries and therefore loans are granted only to those co-operatives and their members who have invested in this bank. Another characteristic of this bank is that the procurement of the capital can be performed through the issuance of "Industrial and Commercial Bonds." The balance of bonds issued, which amounts to ¥101,800 million as of the end of March 1959, occupies an important place in the funds available for loans.

As for the conditions for loans, there is a condition that the loans will be used for equipment and operational funds only. The maximum loan is ¥100 million for cooperatives and the maximum direct loan to the members of the cooperatives is ¥10 million. Interest rate is 0.025 yen per day per ¥100 for short term loans (discounting of bills, draft loans, bond loans of short terms of less than one year), 9.4 per cent per annum for long term loans of more than one year and less than two years, and 9.6 per cent per annum for loans of more than two years.

As for the number of offices, there are one main office, 53 branch offices, 2 sub-branch offices and 2 offices, totalling 58. In addition to these, there are 133 credit associations operating as agents.

As of the end of March 1959, the balance of loans was ¥31,200 million for equipment and ¥108,400 million for operational funds, totalling ¥139,600 million.

## IV.

## Rationalization and Improvement of Credit Supplementary System

So far explanations have been made of the measures to expand the source of funds directed towards smaller industries and the rationalization and strengthening of governmental financial organizations for smaller industries. These are aimed at securing funds for smaller industries to solve the financial difficulties they are confronted with as well as to rationalize the channels for such financing.

As a means to facilitate financing smaller industries, however, there is another measure, besides the two just mentioned, which is to place smaller industries on financial channels, that is, to make it easier for smaller industries to obtain financial aid. This may be in a sense interpreted as the rationalization and modernization of smaller industries as a whole in an attempt to improve their structure. However, mention will herein be made of the credit supplementary system, i.e. credit guarantee and credit insurance systems only.

*(1) Credit Guarantee Association:* The purpose of the Credit Guarantee Association is to facilitate financing for the smaller industries

in their attempt to obtain financial assistance from banks and other financial organizations, by guaranteeing their obligations resulting from the loans, and this association is established exclusively by local public entities. (It was first established in Tokyo in 1937 as a corporation under the Civil Law). Later, to meet the necessity to strengthen the financial basis of the association and to legally define the scope of its activities as well as to place it under governmental control, the association was reorganized into a special corporation when the "Credit Guarantee Association Law" was enacted in 1953. There are presently a total of 52 such associations, 46 in prefectures and 6 in cities.

As of the end of March 1959, the number of cases handled by the Credit Guarantee Association is 232,132, amounting in value to ¥93,900 million.

*(2) Smaller Business Credit Guarantee Corporation:* This system is aimed at facilitating providing the smaller industries with their business funds. This system came into being in 1950 under the provisions of the "Smaller Business Credit Guarantee Law", in order to obtain governmental insurance of the loans extended by financial organizations or the Credit Guarantee Association to the smaller industries. This insurance system was at first operated in the Government's special accounts for the smaller industries credit insurance. However, with the enactment of the "Small Business Credit Corporation Law" in 1958, the special accounts for the smaller industries credit insurance were abrogated and insurance activities have since been carried out by the above-mentioned corporation.

This corporation is the same as other financial corporations in nature and its mission is to insure the financial organizations claim with regard to their loans extended to the smaller industries or to insure the guarantee made by the Credit Guarantee Association as well as to provide the Credit Guarantee Association with the funds necessary for their insurance activities.

Of the total capital of some ¥14,700 million of this corporation, the funds for financing the Credit Guarantee Association amount to ¥6,800 million.

In insurance activities, there are the "Finance Insurance" for financing organizations and the "Guarantee Insurance" for the Credit Guarantee Association. The former is a system designed to insure the financial organizations' claim, thereby enabling them to cover any losses arising from inability of medium and small enterprisers to make repayment of the loans extended them. The latter is a measure whereby any losses incurred upon the Credit Guarantee Association in its fulfilment of insurance in case of unexpected failures, can be covered by insuring the obligations of the smaller industries to whom loans have been extended.

As for the utilization of credit insurance, there were, during the period April 1958 through the end of March 1959, 294,316 cases of credit insurance amounting in value to ¥91,400 million and 3,349 cases of finance insurance amounting to ¥6,000 million.

Loans are extended to 52 Credit Guarantee Associations all over the country. There are long term loans for a period of two years at an interest rate of 2.5 per cent per annum and short term loan for a period of 6 months at an interest rate of 2 per cent per annum.

As seen above, business to supplement credit for the smaller industries is generally carried out by the Credit Guarantee Association. The Small Business Credit Guarantee Corporation for the smaller industries backs up and supports the association as an agent that conducts re-insurance of the guarantee made by the Credit Guarantee Association, and also as an agent that strengthens the Credit Association or supplies the funds necessary for the expansion of business. And these two are contributing to the promotion of the credit supplementary system for smaller industries.

## Modernization of Labor in the Smaller Industries

Irrationality of management, superannuation of equipment and low productivity in the smaller industries are as stated before. However, the unfashionable labor-management relations existing in smaller industries can also be pointed out as another factor that is hampering the development of medium and small enterprises. This can be ascribed to the fact that apprentice-like labor management relations have long existed in the smaller industries. The Government, however, has been making efforts to establish new labor-management relations for the development of the smaller industries in the belief that such new relations will stabilize the management of the smaller industries and bring about an increase in profits.

As a step to modernize the management of the smaller industries, there is a measure to strengthen the management of such industries itself or to enrich the source of wages and also a more direct measure aimed at improving labor conditions and promoting welfare. For example, there are the minimum wage system which determines the minimum wages of workers, and the retirement allowance mutual benfit system under which various considerations are made with regard to the workers' retirement allowances. Furthermore, much can be expected for the smaller industries from the utilization of the unemployment insurance and the worker's accident insurance, although these are not primarily intended for the smaller industries. In addition to these, guidance of labor management based on the actual conditions of the smaller industries in line with the smaller industries physical examination system, the technician training system which eliminates the defects in the apprenticeship in the past, mutual vocational training system, etc. may be mentioned.

Nowadays, the management, too, show very much interest in and

are intent on the improvement of labor conditions to solve various difficulties resulting from the lack of technicians.

Measures to improve the labor conditions and promote the welfare for workers in smaller industries are established independently by the Ministry of Labor. Of these measures, explanations will be made about those measures directly related to smaller industries.

## 1. The Minimum Wage Law

The Minimum Wage Law was enacted in 1958. It is needless to say that the wage is, along with working hours, the most fundamental thing in labor conditions. As far as working hours are concerned, due protection is given to the workers in accordance with the Labor Standards Law which was enacted in 1947.

The direct objective of this law is to improve labor conditions (details of labor contract such as the nature of work, working hours, the amount and the method of payment of wages, recesses, holidays, paid vacations, etc.) by insuring the minimum wage and to contribute to the stabilization of workers' life.

The minimum wage system has brought about qualitative improvements on labor and stabilized employment in small and medium industries. In view of the structure of smaller industries in Japan, excessive competition among enterprisers is almost inevitable, often resulting in undue reduction of wages. Under the minimum wage system, however, competition among enterprisers is made on the same conditions, thereby contributing to the prevention of unfair cometition. As competition among enterprisers is made under the same conditions and labor costs increase, the management have to, whether they like it or not, improve their operational methods or their equipment and facilities in an effort to bring down overall production costs, and the modernization and rationalization of enterprises are thus facilitated.

The minimum wage system of Japan does not define the amount of the minimum wage but stipulates the principles and procedures for the determination of the minimum wage.

There are the following four categories in the minimum wages, classified according to the procedures to be followed in the determination of the minimum wages.

*1) Minimum Wage in Accordance with Agreements between Enterprisers:* Under this system, an enterpriser who has concluded agreements with other enterprisers submits an application to the Government requesting the determination of the minimum wage in accordance with the agreements. The Minister of Labor or the chief of the Prefectural Labor Standards Bureau in turn deliberates the matter with the Minimum Wage Council and determines the minimum wage, duly taking into consideration the opinions of all parties concerned.

*2) District minimum wage in accordance with agreements between*

*enterprisers:* When the minimum wage determined in the system (1) above is applied to the majority of the workers and their employers engaged in the same kind of work in a certain district, the minimum wage applicable to the management and labor engaged in the same type of work in the same district is determined based on that minimum wage, upon request by the majority of employers to whom the determined wage applies.

*3) Minimum Wage in Accordance with Labor Agreement:* When a labor agreement concerning the minimum wage is applicable to the majority of the management and labor engaged in the same type of work in a certain district, the minimum wage applicable to all of the management and labor engaged in the same type of work in the same district is determined based on that minimum wage, upon request by both parties or all members of one of the parties to whom the Labor Agreement applies.

*4) Minimum Wage Based on Deliberations by Minimum Wage Council:* In case it is difficult or inappropriate to determine the minimum wage by any of the above-mentioned three systems, the Labor Minister or the chief of the Prefectural Labor Standards Bureau requests investigations and deliberations by the Minimum Wage Council, and determines, in full considerations of its opinions, the minimum wage for a certain type of business or a certain district.

The number of cases of dermining minimum wages as of August 31, 1959, amounts to 164. Of these, the number of minimum wages determined in accordance with agreements between enterprisers is 155 and that of district minimum wages determined in accordance with agreements between enterprisers is nine. The minimum wage system is applied to 16,407 workshops and to 293,336 workers.

## 2. Retirement Allowance Mutual Benefit Association for Small Industries

The employees of the smaller industries are far less blessed in welfare than those of large enterprises. In the retirement allowance system also there are many smaller industries which do not even have such a system, whereas all large enterprises have a complete and substantial retirement allowance system. This is because the smaller industries do not have very much capital and it is very difficult for individual enterprisers to establish a retirement allowance system worthy of its name.

In view of this situation, the "Smaller Industries Retirement Allowance Law" was enacted based on the spirit that the smaller industries should assist one another for the benefit of those medium and small enterprisers who are unable to establish a retirement allowance system for themselves. This system is operated by contributions from different enterprisers and is aimed at promoting the walfare of the employees in the payment of retirement allowances as well as developing th smaller industries by stabilizing employment and promoting the employees' will

to work.

The "Smaller Industries Retirement Allowance Law" was enacted in 1950 and under the provisions of this law, (1) A mutual benefit organization for the smaller industries retirement allowance system is established. (2) The smaller industries with the number of employees less than 100 (30 in commerce and service) conclude with the organization an agreement on mutual assistance by means of retirement allowance and the enterprisers of such industries pay premium monthly. (3) When an employee of such industries retires, he is paid retirement allowances by the organization. (4) Operational expenditures required by the organization and part of the funds for the payment of retirement allowances (for those whose monthly premium is 200 yen, five per cent if payment of premium has been made for five years but less than 10 years, 10 per cent if premium has been made for more than 10 years) are partly financed by the Government.

The organization has been accepting applications since November last year and 15,000 workshops, employing 180,000 workers, have joined the organization as of the end of July this year. The average number of workers per workshop, joining this organization, is 11.88 and the average amount of monthly premium is 428 yen.

### 3. Mutual Vocational Training for Smaller Industries

In the smaller industries, workers' technical level is generally quite low compared with that in large industries and this, together with the limited amount of capital and equipment, brings about low productivity and low wages.

However, as stated before, smaller industries are now obliged to promote the quality of labor as well as to modernize their equipment, depriving themselves of low efficiency, long working hours and low wages, and therefore future development of vocational training in the smaller industries is strongly hoped for.

There is mutual vocational training as a system to train technicians in the smaller industries. This is a vocational training conducted by an organization mutually formed by enterprisers who are unable to put into force vocational training system for themselves. Under this training system, trainees gather at a place where they attend classes in various subjects and also practise together as many fundamental techniques as possible. Training in applied practice is conducted in the workshops to which the trainees belong. When training is conducted under this training system, approval is given by the prefectural governors in accordance with the Vocational Training Law and those who conduct the training following specified programs may be favored with the following advantages and conveniences.

(1) The expenditures required for training are partly financed by the prefecture in order to alleviate the economic burdens imposed on the enterprisers as a result of vocational training.

(2) Assistance necessary for training is preferentially extended by public vocational training facilities.

(3) Exceptional authorization will be granted on the period of contract, restrictions on operations involving harms and dangers, and prohibition of work in mines as defined in the Labor Standards Law.

(4) Those who have completed the training course are treated favorably in their qualification for examinations for engineer's licence and for instructors in vocational training.

The effects of the training are noted in the following: (a) the trainees acquire techniques and skills about twice as quickly as other workers hired at the same time and productivity is raised; (b) the trainees' power of creation and judgement is fostered and work efficiency is elevated; (c) power of application is fostered and they can promptly adapt themselves to new production systems and renovation of equipment and facilities; (d) their sense of responsibility is enhanced; (e) they have favorable effects on other workers in the maintenance of workshop regulations, fostering of ambitious attitudes, elevation of overall technical level and efficiency, etc.

The overall statistics on the vocational training for the smaller industries are not definitely known, but mutual vocational training (approved) is conducted, as of April 1959, in 467 organizations comprising 18,123 companies, and the number of trainees is 38,894.

## V.

## Other Measures

So much for chief measures being taken to foster and promote smaller industries. In the following, an outline will be given of some other measures, such as those for tax reduction, improvement of economic circumstances, as well as those recently considered as promotive measures by industry and those for industries of a still smaller scale.

### 1. Tax Reduction

At present, the Taxation System Investigation Committee (an advisory organ to the Prime Minister formed in 1959 to deliberate on matters necessary for the streamlining of tax administration and for the establishment of a new system under which both national and local taxes can be collected on a realistic and rational basis) is engaging in a fundamental review of the taxation system in Japan.

In the reexamination of systems for special measures and enterprise

taxation system, such problems are being taken up, the materialization of what has long been awaited by smaller enterprises: (1) reduction of durable years of machinery and equipment employed in a major portion of smaller enterprises: (2) maintenance of proper balance between the tax burden levied on individual enterprises and that on incorporated enterprises; (3) reduction of tax load to family corporations; (4) increase of full-time employee deduction, etc.

It will be sufficient here only to enumerate those steps so far taken in the taxation system for smaller enterprises.

*1) Reduction of Corporation Tax:* To reduce tax load imposed on small and medium corporations, a reduced tax rate of 32 per cent is applied to yearly incomes not exceeding ¥2 million (in the case of incomes above ¥2 million, 38 per cent to the portion exceeding ¥2 million).

*2) Reduction of Enterprise Tax:* To contribute to the reduction of smaller enterprisers' tax burden, graded tax rates are applied to individual and incorporated enterprise taxation. In addition, a basic deduction of ¥200,000 a year is approved in the individual enterprise taxation.

*3) Approval of Special Depreciation for Machinery Equipment in Joint Enterprises and Smaller Industries:* A 50 per cent increase in the special depreciation is approved for three years, when smaller enterprises come into possession of such specific machinery as is designated in the Taxation Special Measures Law as contributing in various respects to be the rationalization of a joint enterprise participated in by several cooperatives, or of such specific machinery as is designated in the taxation special measures Law as necessary for modernization of equipment in export and important basic industries or in kinds of industries related with the said categories and whose major portion is occupied by smaller industries.

Thus, advance depreciation has been approved for the designated types of machinery so as to provide enterprisers with easier approach to them in point of tax, as well as to accelerate the management improvement and equipment modernization. At present, the specified items of machinery are as follows: in the first category, there are a total of 543 types, namely, 170 types of general machinery and 373 types of exclusive machinery, while in the latter, there are a total of 672 types.

Further measures favorable for a member of smaller industries' union include the application of tax rates lower than those for ordinary corporations to corporation and enterprise taxes, since smaller industry of this kind enjoys the status of special corporation, and is exempted from the stamp duty, municipal property tax, etc.

## 2. Improvement of Economic Circumstances for Smaller Enterprises

The fundamental aim of measures taken for smaller enterprises is undoubtedly directed towards the guidance and fostering of smaller

enterprises by means of rationalization, technical improvement or union based on their voluntary move so that they may be able to compete with major industries in the common market. Moreover, the Government will continue to devise special protective measures for smaller enterprises in financing and taxation in an effort to expedite the strengthening of their competence.

Turning, however, to the actual state of Japanese economy, keen competition among the numerous and lesser industries themselves is observed, while, at the same time, major industries with enormous economic power exert overwhelming influences, intentionally or unintentionally, upon the smaller industries, with the result that the smaller industries are driven into even more excessive competition.

To cope with this situation, government controls regulating larger enterprises and labor policies mentioned before are necessary, side by side with measures to secure the stand of smaller industries and to promote them from the viewpoint of national economy. Intense centralization of economic power often stands in the way of free and fair competition, unduly affecting economically weaker industries in terms of either dealings or subcontracts. It is essential to put under control such antisocial practice on the part of huge economic power by law, and to uphold the principle of free competition. For these purposes, there are policies aiming at prohibition of private monopoly and rationalization of subcontract business.

*1) Policies against Private Monopoly:* In 1947, the "Private Monopoly Prohibition and Fair Transactions Maintenance Law" was enacted in order to create healthy circumstances in which every industry can engage in normal and fair competition on an equal footing by prohibiting private monopoly, unreasonable restraint of trade or unfair mode of transaction. As already mentioned, however, smaller industries are allowed to form a cartel on conditions stipulated in law for their healthy development.

*2) Policies for Rationalization of Subcontract Business:* The "Law on the Prevention of Delay in Payment to Subcontractors" enacted in 1916 is an integration of protective measures for subcontractors, most of them being smaller enterprisers. Under this law, they are assured of fair transactions and protected from their parent companies' delay in payment or unreasonable actions which will harm the subcontractors' interest.

### 3. Promotion Measures by Industry and Measures for Smaller Industries

The measures mentioned so far are intended for the small and medium enterprises in general. It must then be pointed out that problems to be resolved do differ according to the type, business status and scale of the industry. To render those steps to promote small industries more effective, therefore, it has been considered necessary that more detailed measures should be worked out in accordance with industrial classification to match their actual conditions, and that special attention should

be taken to the lesser industries whose scale falls under a certain standard. The former consideration took shape as the enactment in 1960 of the "Classified Smaller Industries Promotion Provisional Law" and the latter as the "Law on the Organization of Commerce & Industry Associations."

*1) Classified Smaller Industries Promotion Provisional Law:* This law, as already mentioned, is originally intended to carry out detailed promotive measures, based on investigations into facts about each kind of industry.

Under this law:—1) A type of industry is designated by estimating the degree of its contribution towards the stability and prosperity of national economy, and its urgency in terms of need for encouragement; 2) Researches are conducted on the actual condition of the said type of industry, and collection of data so as to clarify the points to be improved upon; 3) Based on these points, a goal of management is set at a level attainable through the small enterpriser's efforts, by formulating and publicizing such related matters as rationalization of management, improvement of equipment, advancement in techniques and the quality of the produced goods, establishment of common facilities, normalization of competition, improvement in business connection, opening of new market, etc; 4) Furthermore, in order that these matters for improvement may be materialized, considerations are given to priority in financing from such sources as the government-authorized Smaller Enterprise Loan Corporation, Central Bank for Commerce and Industrial Associations, or to the financing for equipment modernization by application of the Smaller Enterprise Promotion Fund Subsidy Law; The competent Minister issues directions and recommendations as occasion arises. The competent Minister's recommendations are addressed to smaller enterprisers and the correlated industrialists when he considers them necessary for the smooth effectuation of the measures, if prescribed, for improvements, such as normalization of competition and improvement in business connections; 5) The Smaller Enterprise Promotion Council has been established as the Minister's consultative body. The organ studies and deliberates on important matters related to the promotion of smaller industries, and it is consulted whenever matters for improvement are to be formulated, recommendations issued, and reports gathered. It will be seen from the above that this law may be regarded as a fundamental law to materialize promotive measures by industry. In carrying out actual improvements, proper steps are taken in the light of the various existing laws related to smaller enterprises.

### 4. Law on Organization of Commerce and Industry Associations

Although both come under the same category of smaller enterprises, there are great qualitative differences between enterprises of a medium scale and upwards and those of a lesser scale (under 20 employees in manufacturing industries and under five in commerce and the service trade) and recently it is urgently needed to devise special measures for

the latter's modernization and rationalization so that such differences may be minimized. When special measures for petty enterprises are considered, it is naturally important to expand or consolidate the hitherto adopted system—measures for financing, social security and reasonable taxation but examining those industries closely from the viewpoint, for example, of business status, composition of employees, knowledge on management on the part of operators, or leisure hours for employees, it is essential to carry out fundamental activities directed to the managers for the improvement of business, namely, (1) itinerant guidance for the rational solution of problems arising from daily operation; (2) introduction and explanation of various relevant systems or methods of management control accompanied, if necessary, by vicarious execution of difficult and complicated procedures to encourage the utilization of the systems. Therefore, the establishment of a system devoted to the guidance and information may be deemed indispensable to the effective and continuous activities of this kind.

It is interesting to note that more than 2,600 commerce and industry associations have long been organized in a spontaneous way as independent local bodies found in each town or village in suburban districts, and that they have been extending some assistance to lesser industries in the area. In the urban districts, chambers of commerce and industry have been playing the role of consultants to lesser enterprisers. The Law on the Commerce and Industry Associations is based on these two kinds of instructing bodies for lesser enterprises—commerce and industries associations in rural areas and chambers of commerce and industries in urban areas.

The gist of this law is that commerce and industry associations may be incorporated provided that they are able to execute those stipulated duties concerning their constitution, activities, superintendence, etc., and that the Government extends assistance to commerce and industry associations and chambers in their efforts to improve management or techniques. Firstly, the commerce industry association is made a special incorporation whose duty it is to work for general improvement and development of commerce and industry in the area and, as a rule, only one association is admitted in a village or town and no concurrence with another commerce and industry association or chamber on the same site is permitted, with the exception of some cases involving amalgamation in municipalities. Any enterpriser who has operated an office or a workshop in an area for the duration of more than half a year may be admitted to the association in the area, while establishment of an association is formally approved by the governor provided that more than half of those eligible enterprisers in the area join it.

The activities of the association include such items as advice and guidance on problems of trade and industry, collection and presentation of various study materials as well as information, opening of lecture meetings and study classes, publication of the association's own opinion at need, reporting and proposal to the administrative agency, vicarious

execution of business matters at the request of enterprises, etc. The association is democratically operated by the general meeting, representatives' meeting, as well as by the staff.

Secondly, mention must be made of the subsidies granted to commerce and industry associations or chambers for the improvement and advancement of management or technique of lesser enterprises. The Government makes a point of applying indirect subsidization; that is, it covers part of the subsidies issued from prefectures for that purpose, and in fiscal 1960, a total of ¥390 million was appropriated in the national budget for petty enterprise subsidy, intended to cover 50 per cent of them. With this appropriation it has been so arranged that 2,451 advising officials are dispatched to commerce and industry associations and chambers to engage in the active guidance of smaller as well as petty enterprises throughout the nation. It is expected that in the next fiscal years, 4,317 advisors will be stationed, in the ratio of one official to every 700 lesser enterprisers.

# PRODUCTION STRUCTURE OF SMALLER INDUSTRIES

## I.

## Fiber Industries

### 1. Cotton Spinning and Weaving

*1) Development of Cotton Spinning and Weaving Industry*

The history of the cotton industry in Japan dates back to very olden times. One version says that cottonseeds were imported into Japan from abroad during the period of Fifteen Hundred, and that they came to be cultivated widely later. And as the use of raw cotton is popularized, the the cultivation of such fiber plants as hemp, paper-mulberry, "cho" (a kind of hemp) and arrowroots declined; these plants used to be the fiber supply source to weave fabrics used by common people, but raw cotton took their places.

In the very beginning, the cotton industry was started as a side business of farmers. The cultivation of raw cotton, hand spinning thereof and then the weaving of cotton fabrics were carried out within the same farming household. It was during and after the middle of the Tokugawa Shogunate regime, when the merchandise-economy had developed to some extent, that these three stages of production process came to be operated by a division of labor.

As the demand for raw cotton increased, there appeared men who would buy all the raw cotton cultivated by farmers in the cotton growing villages. They were the brokers known as "Men-kai" (cotton buyer) who monopolized the raw cotton supply of growers to distribute it to spinning farmers in order to obtain cotton yarn. Furthermore, "Men-kai" furnished loom-operating farmers with either raw cotton or cotton yarn to make them weave cotton fabrics. It was under such circumstances that wages-earning spinning and weaving farmers have come into the existence.

There was no substantial change in such relationships between the brokers and growers (as well as between the former and spinners and weavers) even after the Tokugawa Shogunate regime ended, and is succeded by the Imperial regime of Meiji (1868), at least in the early stage of the new era. Farmers continued to grow raw cotton, spin yarns, and weave cotton fabrics with their primitive looms for the brokers.

In the third year of the Keio Era (1867), however, the feudal government of Kagoshima inaugurated the cotton spinning industry. In the third year or the Meiji Era (1870), the Sakai cotton spinning mill, a branch factory of the Kagoshima mill, was opened to business. And in

the fifth year of the Meiji Era (1872), moreover, the Takinogawa cotton mill was established in Tokyo.

With the rise of these modern cotton spinning mills, farmers' hand spun cotton yarn was no longer wanted. In or about the 20th year of the Meiji Era (1887), farmers were entirely shut out of the raw material market.

As regards the cotton weaving, the production by power looms also rose in or around the 20th year of the Meiji Era, following the establishment of such companies as the Kyoto Menshi Orimono, Osaka Shokufu, Onagigawa Mempu, Kanakin Seishoku and so forth.

In the cotton weaving, however, mechanized large scale industry was not realized all of a sudden, as in the case of the cotton spinning industry. Large factories had their strong point in the production of white cotton and sheetings, but hand operated looms of olden times continued to hold their own in the weaving of striped cotton. Consequently, the homecraft industry continued to prevail for a long time as part of Japan's agricultural economy.

Japan's cotton spinning and weaving industry made a sudden development in or around the 20th year of the Meiji Era (1887) and thereafter, thanks largely to the protective policy followed by the Meiji government.

The three pioneer spinning mills which were referred to previously had made-in-England spinning machines installed. Nevertheless, the production techniques of the factory hands were of primitive level, and the combined total number of spindles was approximately 6,000. It was utterly out of the question to match the cotton industry of the advanced capitalist nations abroad in those days. The Japanese import of cotton goods, therefore, kept on increasing enormously. During the first several years of the Meiji Era (1868-1912), cotton goods always constituted one-third of the total imports into Japan.

The Japanese Government of Meiji, consequently, decided to take a policy to protect Japan's cotton industry in or about the 10th year of Meiji Era (1877) primarily for the purpose of discouraging the cotton goods imports.

In 1878, the Government imported two units of cotton spinning machinery of 2,000 spindles each from England to establish government-operated model spinning mills in Aichi and Hiroshima Prefectures, which were the cotton growing centers at that time.

In 1879, moreover, the Government imported 10 units of 2,000-spindles spinning machinery to re-sell them to private enterprises on special terms of 10-year installment payments without interest, in addition to financing private mills in their import of spinning machinery.

On the strength of such protective measures, the Japanese domestic cotton yarn output became larger than the import for the first time in 1890. The Japanese export of cotton yarn was 43 per cent of the import

in 1895 but it amounted to 264 per cent of the import in 1897; that is, Japan imported 53,000 bales and exported 14,000 bales. Thus Japan turned from a cotton yarn importing nation into an exporting nation. During this time, the number of mill hands also increased, from 1,362 in 1882 to 84,832 in 1899.

In the cotton weaving industry, the domestic production amounted to 185 per cent of the import in 1885. In 1909, moreover, the export began to exceed the import. And Japan developed into a cotton textile exporting nation from a cotton yarn exporting nation.

Japan's cotton spinning and weaving industry had shown such a remarkable development with the 20th year of the Meiji Era (1887) as a turning point. Incidentally, however, it represented the concentration of capital by major enterprisers. Such concentration were carried out during the depression that followed the Sino-Japanese War (1894-5) and it was further accelerated after the Russo-Japanese War (1904-5).

Speaking mainly of the cotton spinning industry, the Mie Boseki absorbed Ise Chuo Boseki in 1896, and it was the beginning of active amalgamation by major spinning companies with smaller ones. The number of companies, after it reached the peak of 76 in 1900, began decreasing steadily until it fell off to 34 or less than one-half in 1911.

In 1913, moreover, the seven major companies including Kanegafuchi, Osaka, Mie, Settsu, Amagasaki, Fuji Gassed and Osaka Godo boasted of having the paid capital which corresponded to 57.7 per cent of the combined total paid up capital of 44 member companies, and they operated 58.7 per cent of the combined total number of spindles. The monopolistic control by major companies of Japan's cotton spinning industry was thus established.

In 1914, moreover, the Osaka and Mie were amalgamated into the Toyo Boseki, while Amagasaki and Settsu were amalgamated into the Dai Nippon Spinning in 1918. The seven major spinning companies were boiled down to the five major companies.

Such amalgamations and absorptions among the cotton spinning companies were carried out after World War I as well. A large number of medium and small sized cotton spinning mills, which were promoted during the war boom period, were badly affected when the reaction set in after the war; many of them were therefore purchased by major cotton spinning companies, incidentally it accelerating the concentration of larger capital.

While the cotton spinning industry went on developing its monopolistic characteristics as outlined above, the cotton weaving industry—which had continued operating for years as a peculiar industry of the nation —witnessed a gradual wane of its trait of being an agrarian side business for earning wages, during the boom years that followed the Russo-Japanese War and World War I, in part affected by the development of overseas markets. Large scale modern management of weaving mills took place in the erstwhile handicraft management.

During the years of 1915 to 1916, electric power became available in a wider area with a result that power driven weaving machines came to be installed at medium-and small-sized factories, it facilitating the transition from the hand-weaving to machinery weaving industry.

These smaller weaving enterprises, in spite of the fact that they have installed power-driven looms, were not free from the control of monopolistic major cotton spinning enterprises. They came to be affiliated with these major enterprises in the end.

Depression set in after World War I, accompanied by the export inactivity, and the cotton weaving industry was badly affected, it giving rise to serious problems affecting smaller industries.

During the 12 year period from World War I to the outbreak of the Manchurian Incident, Japan's cotton spinning and weaving industry experienced hard times continuously. So much so that the 9th series of agreement-curtailment of the production was put into practice in the spring of 1920. As the financial panic broke out in April, 1927 the industry had to carry out the 10th series of production curtailment. The output went on decreasing steadily.

During this time, however, the readjustment of smaller enterprises of weak financial foundation progressed, in the form of merger. On the other hand, new machinery of higher efficiency was installed to replace obsolete units.

It is especially worthy of note that Japanese spinning mills began producing higher counts of yarn, instead of concentrating on lower counts them. In addition, they also began operating fabric weaving and dyeing in addition to spinning. And the six major companies inclusive of Toyo Spinning, Dai Nippon Spinning, Kanegafuchi Spinning, Fuji Spinning, Nisshin Cotton Spinning and Kurashiki Spinning came to own approximately one half of the combined total number of spindles of Japan.

Similar development was witnessed in the cotton weaving industry as well. It made a spectacular development with World War I as a turning point, and it also suffered a severe setback in the postwar depression and the financial panic. The industrial readjustment was ievitable also.

The readjustment was carried out not only among major enterprises but also among smaller enterprises. The Menkoren (Japan Cotton & Staple Weavers Association) was organized in 1928 to carry out the production control as well as the inspection of products.

While large cotton spinning companies concurrently operating weaving enterprise endeavored to improve their production techniques by having automatic looms installed, smaller enterprises specializing in the weaving were obliged to hold their own by means of low wages.

As the international situation turned for the better, eventually leading to the outbreak of World War II, the cotton spinning and weaving

industry was placed under a severe wartime control in earnest. Looms were scrapped according to the wartime enterprises consolidation program, while fiber factories were either closed or amalgamated. The number of looms in Japan amounted to 356,000 units before the enterprises consolidation program was put into practice; at the close of the war, the number had dwindled to about one-third or 121,000 units.

In the wake of World War II, there were the so-called ten major cotton spinning and weaving companies surving the severe wartime control. They were: Tokyo Spinning, Dai Nippon Spinning, Kurashiki Spinning, Daiwa Spinning, Shikishima Spinning, Kanegafuchi Spinning, Fuji Spinning, Nitto Spinning, Nsshin Cotton Spinning and Kureha Spinning. In 1947, a memorandum was made public by the General Headquarters, SCAP, directing that the restoration of Japanese cotton spinning industry to the extent of 400,000 spindles would be approved. As the result, 25 "new" companies came into existence.

In June 1951, moreover, the General Headquarters, SCAP lifted all the restrictions pertaining to the cotton industrial equipment in Japan. Incidentally there was the Korean War to stimulate Japan's business activities. And a total of 94 so-called "new-new" companies were promoted.

These "new" and "new-new" companies were called the "smaller" enterprises in relation to the aforementioned 10 major companies. For one thing, the major companies operated 70,000 spindles per mill on the average whereas the "smaller" companies had 40,000 spindles per mill and "new-new" mills, 10,000 spindles. Thus a remarkable difference has come into existence between the major and smaller enterprises in their scale of structural composition.

Competition among these ten major enterprises then gave rise to a new trend of bringing small-and medium-sized mills into their respective spheres of influence through affiliation, in the manner of making them either subsidiaries or plain branch mills.

Similar trend was also witnessed among the weaving mills. The alignment of smaller weaving mills into the system of major enterprises started already in 1938 when the export link system was enforced as part of the wartime control program. In postwar years, the B.S. contract system was put into practice in 1948 to take the place of the state-owned cotton processing system; under the new system, the U.S. cotton was allocated to export fabric weavers. Cotton weavers were thus placed under the control of the spinners, to be engaged in piecework. And this trend of alignment became all the more conspicuous during the depression that followed the termination of the Korean War.

Such synthetic fibers as nylon and vinylon came to be manufactured on industrial basis in 1949, and furthermore, they came to be produced on mass-production basis by large cotton spinning and chemical fiber enterprises in and after 1953. The synthetic fibers have thus become a formidable rival of cotton, silk and rayon filament.

As for synthetic fiber manufacturers, they realized that it was neces-

sary not only to produce and sell the raw material and yarns but also to turn out finished products in one integrated process, in order to secure the market in competition with the existing fibers, such as cotton, silk and rayon. Consequently, they have come to embrace small and medium enterprises in various stages, such as weaving, dyeing, and sewing, within their system.

There were, therefore, not many small and medium enterprises that carry on weaving on their own; they increasingly came to be operating under contracts with cotton spinning companies.

What is the outstanding situation of Japan's cotton spinning and weaving industry then? That will be the subject for review in the next section.

*2) Production Structure of Cotton Spinning and Weaving Industry*

1. Cotton Spinning

Statistical returns for the fiscal year 1958-59 shows that there were 145 cotton spinning companies which maintained 9,019,000 spindles that were in workable condition, and that they had 72,000 persons (12,000 males and 60,000 females) on their payroll. Their combined total production was 904 million lbs., 50 per cent of which was produced by the ten major enterprises.

The raw cotton consumed amouned to 1,000 million lbs., of which almost the entire supply was imported from abroad. Moreover, half of the imported raw cotton came from the United States. A general trend in the worldwide raw cotton market was that the quotation was on the decline, but the U.S. cotton alone was supported at a relatively higher level than others. In view of the Japanese cotton industry's heavy dependence upon the supply of American cotton, this was a problem.

The cotton yarn output showed a tendency to exceed the demand. The surpluses of cotton yarn and fabrics piled up, in spite of the fact that the Ministry of International Trade and Industry effected the production readjustment measures in September 1957. The inventories on hand amounted to a postwar new high of 62 million lbs. in March 1958. In order to deal with such a situation, the Ministry advised the industry to carry out the curtailment of production for the third time since the war, by sealing 30 per cent of the productive equipment at a uniform rate. The cotton spinning machines thus sealed amounted to 2,600,000 to 2,700,000 in terms of spindles.

The Japanese export of cotton products is on the wane. It is a general trend throughout the world that the export trade in cotton goods is shrinking due in part to the postwar development of this industry in the less advanced countries. The rise of the cotton industry in Communist China and India is particularly noteworthy. Inevitably Japan's cotton textile export trade can not stay free from the effect of such changes in the world situation. The fiscal 1958-59 export of cotton yarn dropped to 22 million lbs. The destination included Hong Kong, Indonesia, Burma, Thailand, East Germany, South Vietnam and Pakistan. As for the

variety, the export of yarns of higher counts was larger than that of lower count yarns.

2. Cotton and Rayon Staple Weaving Industry

Japanese cotton and rayon staple textiles can be classified into two kinds, viz., "wide" and "narrow" widths. Enshu, Chita, Senshu and Banshu are the principal production centers.

"Wide" fabrics are produced under contracts with either spinning companies or trading houses mainly for export, and broad fabric weavers operate on a larger scale than weavers of narrow fabrics in their factory structure.

As shown in Table 1, there were 9,644 enterprises as of February 1959 where they had 316,099 units of looms installed. Seen from the angle of mill hands, factories employing less than 30 persons numbered 7,903 or 82 per cent of the combined total number of enterprises. The number of factories employing more than 300 persons was 100 or a bare one per cent. Seen in the light of the number of looms owned, the former had 71,119 units or 28 per cent while the latter had 58,454 units or 25 per cent.

As for the narrow fabrics which are produced mainly for domestic consumption, there were 5,370 enterprises possessing 86,973 looms. The number of enterprises that employ less than 30 persons was 4,743 or 87 per cent while the number of enterprises employing more than 300 persons was only 0.2 per cent of the total.

In the case of narrow fabric weaving, there are an overwhelming number of enterprises which are operated in the manner of an agrarian side business in an extremely small scale.) As seen in the light of the number of looms owned, the former had 41,416 units or 48 per cent while the latter possessed 5,903 units or six per cent.

As it may be seen by the foregoing description, the cotton and rayon staple weaving industry is run almost entirely by smaller enterprises. It is mainly by major enterprises that both spinning and weaving are operated in this field, the largest of them being the ten major cotton spinning companies. Smaller enterprises almost entirely specialize in weaving.

The yearly production in 1958 (See Table 2) reveals that the cotton textiles amounted to 3,133 million square yards, rayon staple fabrics, 1,203 million square yards. Both of these production figures are smaller than those of the preceding year. Of these totals, cotton textile exports amounted to 1,888 million square yards while that of rayon staple fabrics, 681 million square yards. The combined total exports of cotton and rayon staple fabrics for 1958 were less than those of the preceding year by approximately 300 million square yards.

In spite of such a decrease, the Japanese export of cotton textiles was by far larger than that of India, the United States and the United Kingdom, and thus continued to be at the top of world cotton fabrics

exporting nations. Not only that, the Japanese exports revealed a favorable trend of selling more fabrics of higher grade as well as of advanced processing. In the Japanese export to the United States, much is expected of better trade in the future in sequence to the prospective business recovery of that nation. During this time, arrangements are being made for Japanese processing of raw cotton for Burma, and also the inclusion of cotton textiles among items of reparations in kind to Indonesia. Such being the situation, the long range outlook of the Japanese cotton industry seems brighter.

In contrast, the domestic situation is far from encouraging. The financial stringency policy taken by the Government in 1957 as a turning point, there was a general decrease in the consumer demand, the subsequent depression of the market, and the accumulation of stock on hand, on top of the decrease in the export. The domestic market quotations of cotton and rayon staple fabrics declined to aggravate the operation cost accounts. The situation was so bad about June 1958 that the market prices of finished products were lower than the prices of raw materials.

There has been an improvement of the market situation in recent months, and yet the "below-cost" production is being carried on, so that a number of smaller weavers either went bankrupt or got out of business.

The current question at issue is how to cover the diminishing returns in the profit account of the enterprises, in the face of the recent low level of the market quotations of finished products. The sub-contract production by smaller weavers has thus shown a steady increase as seen in Table 3.

The Men- Sufu Koren which is a national organization of cotton and rayon staple weavers is at present endeavoring to carry out restrictions on the installation of new equipment as well as the production quantity in order to eliminate excessive competition among the fellow-weavers thereby to prevent a further decline of the market quotations. The Men-Sufu Koren enforced the sealing of wide fabrics weaving looms by 20 per cent during fiscal 1957 by agreement among the weavers at their free will, although the measure was based on the Smaller Industries Stabilization Law. It was soon found, however, that this spontaneous measure of restrictions on the part of the weavers was not effective enough to produce any immediate favorable effects upon the market toward its stabilization. Consequently, more rigid restrictions were enforced in April 1958 by virtue of the Smaller Industries Organization Law. In 1959, excess looms numbering 31,000 units were disposed of.

3. Cotton Spinning and Weaving Techniques

The cotton spinning and weaving industry consists of two departments of spinning and weaving.

The spinning department undertakes the manufacturing of cotton yarn from raw cotton through the following different stages of processing:

Mixing and whipping process: the raw material, that is, raw cotton, is processed by the mixing and shipping machine to clean it of dusts, as well as to be thoroughly mixed. The raw cotton thus treated is called lap.

Carding process: the lap is fed to the carding machine to make the fibers turn in the same direction into slivers.

Drawing process: here the curling slivers are stretched and then thickness of each sliver is made even. Moreover ,the sliver is elongated by the drawing frame.

Roving process: the sliver is further elongated into thinner roving and then twisted to prepare it for the next process of spinning.

Spinning process: this is the final stage of yarn production process in which the roving is further elongated into the required thickness of single yarn of even quality. In this spinning process, either one of the two types of machines, namely the ring spinning frame or the mule spinning frame, is employed. In Japan, the ring spinning machine is used almost exclusively.

Next comes the weaving department where the cotton yarn is woven into fabrics.

In the preparatory stage known as warp winding, such machines as warpers and sizing machines are employed to get the warp ready for the loom. The threads that run lengthwise (warp) and crosswise (weft) are then woven into a fabric on the loom. After that some finishing touches are given. So the cotton fabric is woven from raw cotton.

In Japan, after the severe depression of 1952, much has been accomplished in the cotton spinning division to better business managament, including the shortening of the production procedure, automation, speed-up of operation, and larger packaging. It is especially worthy of note that the roving process has been omitted entirely following the introduction of the super-high-drought spinning frames; the spinning process is started directly with the slivers of the drawing process.

Such technical innovation, however, requires a large amount of equipment investments. The super-high draught spinning frames are used only at the ten major companies. Smaller industries such as the so-called "new" and "new-new" enterprises are too busy to enlarge their production capacity to look after such costly technical improvement. As the result, there has developed a marked trend in which the ten major companies concentrate on the production of high count yarns while the smaller enterprises produce mainly heavy yarns.

In the cotton weaving industry, as it has been mentioned previously, it was mainly the major enterprises that run concurrently the weaving and spinning business, whereas smaller enterprises almost exclusively specialized in the weaving of cotton and rayon staple fabrics. Further-

more, 87 per cent of these smaller enterprises were operated by mills employing less than 30 persons.

Between these two groups of enterprises — one engaged in weaving and spinning concurrently and the other specializing in the weaving only — there is a great difference in technical standards.

In the case of spinning — weaving enterprises, most of the mills are equipped with more than 100 looms. In the case of the ten major companies, 80 per cent of their mills are equipped with than 500 looms each. On the other hand, hardly four per cent of the enterprises specializing in weaving are equipped with more than 100 looms. Furthermore, there are still mills where treadle-looms are operated, although their number is small.

A study on productivity finds that large scale factories, as mostly old in their business history, have some superannuated looms. But they have effected repairs and modernization of these looms and therefore both operative accuracy and efficiency have been improved. In contrast, small scale factories have obtained their looms mostly after the war. Some of these were used (second-hand) sets while others were obsolete, the present users cannot afford to modernize, and therefore, these looms are often low in their accuracy as well as in efficiency.

Some of the smaller factories are unable to carry out the integral operation of the entire process of the preparatory, weaving and finishing stages of work at their own factories; they depend on other factories to do the preparatory and finishing jobs. Noteworthy is the fact that very few of these factories are equipped with such important mechanical equipment as sizing and warp winding machines. This is partly due to the fact that it is not advantageous for smaller enterprises to possess these mechanical units. Nevertheless, it is true that the absence of such equipment affects the efficiency of minor enterprises adversely, thereby pushing production costs higher.

In the face of such a situation, the Japanese Government has taken measures to facilitate the modernization of mechanical machinery and equipment of smaller enterprises by granting subsidies.

During fiscal 1956, such subsidies were granted to 2,200 looms and some preparatory units such as pirn winding (spooling) machines and high speed sizing machines. In the fiscal 1957-58, moreover, subsidies were granted to 1,800 looms and some preparatory machines for their modernization. Nevertheless, the subsidies were not sufficient; it only increased the financial burden on the part of these smaller enterprises. Consequently, not much has been accomplished in the improvement of industrial facilities, in spite of the fact that they are pressed by the urgent need to modernize their obsolete machines and equipment.

4. Trends for the Future

It is recalled that the cotton industry in Japan developed early and rapidly to become one of the largest modern industries of the nation. This is one of the few industrial enterprises of Japan which may compete

advantageously with the toughest rivals of the world in point of technical standards. The Japanese cotton industry, however, has problems of its own.

First, there is the synthetic fiber industry which has made a remarkable development to such an extent as to affect the progress of the cotton industry.

Japan's cotton industry realized its golden age in or about 1935. Its exports surpassed those of raw silk and silk goods. But chemical fiber products (rayon and rayon staple) were already rising as Japan's new champion in the export trade.

In the postwar years, the synthetic fiber industry (which represents the technical innovation of Japan today) has made so spectacular a development that the cotton industry is about to be dethroned from the position of the representative textile industry of the nation.

Considering the boundless growth potentialities of synthetic fibers and the limited mechanical and possibilities of cost-down, it already seems to be an established fact that the advent of synthetic fibers has overshadowed the prospects of the cotton industry.

Second, there is the question of employment. Today there exists a big difference in the amount of wages between large spinning-weaving plants and smaller enterprises; the wages paid by the latter is less than one half of what is paid by the former. It is a natural course of events that mill hands go to larger enterprises who pay better, while smaller enterprises specializing in weaving experience great difficulties in obtaining workers.

The Japanese Government endeavors to eliminate this wage disparity by enacting such legislative measures as the minimum wage system and the retirement allowance mutual aid law. Meanwhile smaller enterprises have also realized that they can no longer carry on with the low wages that they have so far paid.

**Table 1: Number of Enterprises and Looms by Scale**

(As of February 16, 1959)

| Scale | 'Wide' fabric weaving | | 'Narrow' fabric weaving | |
|---|---|---|---|---|
| | No. of enterprises | No. of looms | No. of enterprises | No. of looms |
| Under 4 looms ..... | 2,778 | 6,827 | 1,489 | 4,079 |
| 5— 19 ..... | 4,211 | 43,088 | 2,803 | 26,621 |
| 20— 29 ..... | 915 | 21,208 | 451 | 10,716 |
| 30— 39 ..... | 448 | 15,077 | 217 | 7,335 |
| 40— 49 ..... | 302 | 13,365 | 111 | 4,916 |
| 50— 99 ..... | 504 | 34,775 | 192 | 12,871 |
| 100—199 ..... | 252 | 34,474 | 82 | 10,808 |
| 200—299 ..... | 109 | 26,680 | 10 | 2,159 |
| 300—499 ..... | 78 | 29,981 | 8 | 2,719 |
| 500—999 ..... | 23 | 15,199 | 5 | 3,184 |
| 1,000 & upward..... | 24 | 75,425 | 2 | 1,565 |
| TOTAL..... | 9,644 | 316,099 | 5,370 | 86,973 |

**Source:** Year Book on Cotton and Rayon Staple Statistics.

**Table 2: Output and Delivery of Cotton and Rayon Staple Fabrics**

(Unit: 1,000 square yards)

| Year | Production | | Delivery | | | |
|---|---|---|---|---|---|---|
| | | | Exports | | Domestic consumption | |
| | Cotton fabrics | Rayon staple fabrics | Cotton fabrics | Rayon staple fabrics | Cotton fabrics | Rayon staple fabrics |
| 1955..... | 3,000,720 | 798,178 | 1,665,277 | 441,108 | 1,438,201 | 364,471 |
| 1956..... | 3,463,757 | 1,002,899 | 1,892,483 | 580,827 | 1,673,942 | 451,180 |
| 1957..... | 3,814,606 | 1,234,264 | 2,213,703 | 751,976 | 1,668,708 | 482,137 |
| 1958..... | 3,133,875 | 1,023,505 | 1,888,912 | 681,830 | 1,411,449 | 400,539 |

**Source:** Year Book on Cotton Rayon Staple Statistics.

**Table 3: Production by Specialized Weavers under Sub-Contracts**

(Unit: 1,000 square yards)

| | 1955 | 1956 | 1957 | 1958 |
|---|---|---|---|---|
| **Cotton Fabrics** | | | | |
| Output ..... | 2,063,762 | 2,452,073 | 2,724,167 | 2,261,005 |
| Output under sub-contracts..... | 1,008,366 | 1,256,895 | 1,562,734 | 1,167,975 |
| Ditto, ratio (%)..... | 48.9 | 51.3 | 57.3 | 51.6 |
| **Rayon Staple Fabrics** | | | | |
| Output ..... | 674,900 | 875,119 | 1,102,296 | 941,666 |
| Output under sub-contracts..... | 383,722 | 518,470 | 662,515 | 556,545 |
| Ditto, ratio (%)..... | 56.9 | 59.2 | 60.1 | 59.1 |
| **Other Fabrics** | | | | |
| Output ..... | 145,695 | 187,063 | 202,732 | 193,246 |
| Output under sub-contracts..... | 66,236 | 85,770 | 103,806 | 99,740 |
| Ditto, ratio (%)..... | 45.5 | 45.9 | 51.1 | 51.6 |
| **Totals** | | | | |
| Total output..... | 2,884,357 | 3,514,255 | 4,029,194 | 3,395,555 |
| Total output under sub-contracts. | 1,458,364 | 1,861,153 | 2,329,055 | 1,824,224 |
| Ditto, ratio (%)..... | 50.6 | 53.0 | 57.8 | 53.7 |

**Source:** Year Book on Cotton and Rayon Staple Statistics.

## 2. Silk Weaving Industry

### *1) Development of Silk Weaving Industry*

Japan's silk weaving industry has a history of two thousand years. It is, however, during the middle of and after the Tokugawa Shogunate period that silk fabrics came to be actively woven as merchandise. Previous to that period, silk fabric weaving was popularized all over the nation either as a handicraft cottage industry in cities or as homecraft undertaking of agrarian families.

In the early part of the Tokugawa Shogunate regime, the kinds of fabrics that low class *samurai*, farmers, industrial and commercial people were allowed to wear were limited to "tsumugi" silk, cotton fabric and hemp. Silk fabrics of higher grades were used only by upper class *samurai*. And the high grade silk fabrics thus used by these high class samurai who gathered in old Edo (Tokyo) were supplied by weavers of Nishijin, the production center of Kyoto, in a monopolistic manner.

As for the "tsumugi" silk fabrics, cotton and hemp goods which were in great demand among the middle and low class samurai who lived in castle towns, as well as among merchant classes were supplied by local farmers, and the farmers produced fabrics for their own use as well.

The weavers of Nishijin, consequently, used to operate advanced looms to weave fabrics known as "twill weaves" and "plain weaves" of high grade even before the Tokugawa Shogunate regime was founded in 1603; they were doing fine as city handicraft industry. In contrast, farmers' silk weaving as side business was carried out with primitive looms known as "izari-bata" (crippled loom) without any progress in their status beyond the pale of an agrarian homecraft industry.

As the time went on, however, these local weavers learned the advanced techniques of the Nishijin weavers. In fact, they made a sudden development about the middle of the Tokugawa Shogunate regime to reach a wider market within the country; the shabby homecraft enterprise was thus reorganized into an agrarian silk weaving industry.

Especially remarkable was the development of such weaving centers as Tango, Nagahama, Gifu, Ashikaga, Isezaki, Hachioji, Chichibu and Kawamata. The rise of such agrarian silk weaving enterprises eventually spelled the wane of Nishijin weavers who had long enjoyed the monopolistic position in Japan's silk weaving industry.

What, then, about the silk reeling industry which furnished the weavers with their raw material, the raw silk?

Before the dawn of the Meiji Era (1868-1912), raw silk was produced entirely by the time-honored but primitive "zaguri" (seated reeling) method. Thanks to the special efforts of the Meiji government to foster the silk industry, the mechanized reeling was introduced for the first time.

First, the Meiji government established a number of model filatures, such as Maebashi Seishijo, Onogumi Seishiba, Tomioka Seishijo and Kankoryo Seishijo. Among other filatures, Tomioka Seishijo was operated under the direct management of the Government. It was established in June 1872 and was operated with 300 kettles and more than 210 reeling women. Moreover, these women were limited mainly to daughters of the *samurai* class. The silk reeling machines were imported from France and were operated according to the French system.

Some time later, more private owned filatures were established one after another. The old style "zaguri" reeling was then replaced by the mechanized reeling from the end of the twenties to the early part of the thirties of Meiji Era (or in the latter part of the 1890s).

According to the statistical returns of the Department of Agriculture and Commerce, the machine reeling output amounted to 330,000 "kan" in 1889 and 580,000 "kan" in 1893 (one "kan" equals to 8.26 lbs.). On the other hand, the "zaguri" reeling output amounted to 520,000 "kan" in 1889 and 640,000 "kan" in 1893. The following year (1894), the machine reeling output surpassed that of the hand reeling. As the result,

hand filatures either dropped off or were engaged in the production of low grade raw silk of special types by utilizing pierced cocoons.

In the domain of silk weaving, advanced twill weaving machines, such as Jacquard machines and batten looms, were imported into Japan from France and Australia in 1873. Since they were exhibited at the First Industrial Exhibition held in 1877, these new weaving machines came into a wider use in different parts of the country.

In 1887, Nihon Orimono Kabushiki Kaisha was established, and it began operating power looms imported from the United States and Switzerland, but the number of factories adopting power looms was still limited until the turn of the present century. They were satisfied with the use of Jacquard and batten looms. For one thing, silk weavers in general as well as farmer weavers were so impoverished in the depression that followed the financial stringency policy of the Meiji government of 1881, they could not afford to buy even batten looms. Many of them came under the control of wholesalers to become wage earners.

Power looms suddenly came into a wider use amidst the unusual prosperity that followed the Russo-Japanese War of 1904-5, notably in and after 1907. This popularity became especially widespread since the appearance of low-priced domestic power looms.

Power looms in the early stage were operated by either hydraulic or gas power, but they became electrically driven since they closing period of the Meiji Era (1868-1912). The electrically operated power looms were employed not only by major enterprises but also by smaller mills. So much so that the number of power looms exceeded that of hand looms in 1912.

It is recalled, however, that Japan's silk weaving was adversely affected by depression that continued for 12 years after World War I up to the outbreak of the Manchurian Incident.

Immediately after World War I, the silk reeling industry enjoyed good business due to active consumption demand in the United States. As a postwar depression set in shortly afterward, business was slow for a while but they enlarged the productive capacity at the beginning of the Showa Era (1926— ) only to bring about a sharp drop in market quotations on account of over-production. Japan's silk reeling industry then suffered a decisive blow from the worldwide business panic of the fourth year of Showa Era (1929).

A series of countermeasures were put into effect to deal with the depression since the beginning of the Showa Era. Teikoku Raw Silk Warehousing Co., Ltd. was established in 1926. The Third Teikoku Raw Silk Co., Ltd. was established in 1928. In 1930, moreover, Sanshi Chuokai, a national organization of the sericultural industry, decided on a production curtailment. In 1931, this society was obliged to take such a drastic step as to order a temporary suspension of production by all the silk reeling enterprises of the nation.

During this time, a large number of enterprises were driven out of

business. At the same time, however, the depression facilitated the progress of readjustment to run enterprises under better management. In addition, there was also a marked improvement in production techniques.

And there was a complete change in the situation after the outbreak of the Manchurian Incident which eventually developed into World War II, as the wartime system was introduced immediately.

In 1941, the Sericultural Industry Control Law was enacted to exercise control over the distribution, price, and inspection of production. As the war progressed, there was an acute shortage not only in manpower but also in raw material supply, and it necessistated the progress of further business readjustment. In 1943, a wholesale amalgamation of enterprises was carried out, and Japan Raw Silk Mfg. Co., Ltd. was established.

Similar trend was followed also by the silk weaving industry, but the blow this industry suffered from the postwar reactionary business slump after World War I was severer than that experienced by the silk reeling industry.

In or about 1930, however, the silk weaving industry was on towards a slow but gradual recovery, on the strength of better export business. It is worthy of special mention that the rayon industry began showing a remarkable progress at about this time to overshadow the development of the silk weaving industry. And there was a spectacular increase in the production of rayon fabrics.

In 1932, the rayon fabrics production amounted to 434 million square yards while the silk fabric output was 326 million square yards; the rayon weaving industry thus not only caught up with the silk weaving industry but its production even surpassed the latter.

Along with the remarkable development of the rayon fabric weaving, the number of power looms in operation also recorded a sharp increase. The output of wide-width fabrics became proportionately larger, in contrast to the wane of the obsolete hand weaving industry.

Following the outbreak of the Manchurian Incident, the silk weaving industry was also subject to the wartime economic control. Under the new regime, smaller silk weavers were quickly forced out of business.

In September 1939, the Japan Export and Import Silk Fabrics Control Corporation was established. As a result, export silk weavers descended to wage earners affiliated with powerful rayon companies. As the war situation made a further serious development in 1940, a wholesale merger of silk weaving enterprises became imperative as a result of the priority given to the wartime production. Still further readjustment of business was necessistated in 1943 with the result that the number of looms dwindled to only one-third of the prewar level.

The war devastation that Japan's silk weaving industry suffered during World War II was severe. Nevertheless, there was an immense demand for fabrics among the nation in the years that followed the ter-

mination of the war. Both the silk and rayon fabric industries therefore showed a remarkable development in these early postwar years.

On the strength of "black market" transactions and inflation, small weavers had an opportunity to make money in a big way. Incidentally, it gave rise to extremely small enterprises in large numbers in every weaving centers.

Japan's business activities were abated a little in and after the so-called "Dodge Line" administrative policy. But in October of the same year, the controlled prices system and fabric consumption taxes were abolished, and it encouraged further increase in the number of looms at weaving centers.

The postwar weavers were invariably weak in their financial foundation, notably in view of the fact that their business was fostered by the "black market" operations and inflation. When the market price began falling in and after 1951 due to depression, many of them either went bankrupt or out of business. Still later, however, the export began to improve with a result that the production of booth silk and rayon fabrics recorded marked increases in 1955. Weavers had an opportunity to recover from the depression that lasted for several years. Especially remarkable was the rayon fabric production which by far surpassed the five-year average of 1932-36. In 1955, it amounted to 770 million square yards.

*2) Production Structure of Silk Weaving Industry*

As it was mentioned previously, the Japanese silk weaving industry has had a history of 2,000 years. Even in the modern times, the Japanese production of raw silk has been the largest in the world, and its export has been also large. In the early part of the Showa Period (1926 — ), however, the rayon industry rose to produce orginally a crude substitute of raw silk. And it has made such an impressive development that the field of productive activities which silk had previously enjoyed has become smaller. Furthermore, the rayon enterprises were inaugurated with enormous capital from the beginning, and rayon filament yarns came to be produced on a mass production basis. As their quality improved, rayon filament yarns came to be used in a wider field of textile industry. During this time, smaller silk weaving enterprises began producing rayon fabrics in their new role of becoming the weaving department, so to speak, of rayon yarn manufacturers. As they began weaving rayon fabrics, the mode of production has also been modernized, e.g. operating iron framed looms instead of old wooden units.

These silk and rayon weavers were scattered in different weaving centers such as Gumma, Tochigi, Hachioji, Yamagata, Ishikawa, Fukui, Nishijin and Tango. In 1957, there were 25,380 such enterprises of which 91 per cent were those operating with less than 30 employees. Extremely small enterprises employing less than three persons amounted to 70 per cent of the combined total, as seen in Table 1.

The combined total production of silk and rayon fabrics in 1958

amounted to 1,176 million square yards, including 202 million square yards of silk fabrics and 772 million square yards for rayon fabrics; spun silk fabrics amounted to 18 million square yards, rayon staple fabrics, 67 million square yards, synthetic fiber fabrics, 81 million square yards and other fabrics, 35 million square yards.

Of the foregoing various kinds of fabrics, it is only the synthetic fiber fabrics that recorded a substantial production increase, in contrast to the trend shown by other fabrics.

Generally speaking, approximately one half of the total production was carried out wage earning enterprisers and the largest number of such enterprises were seen in the domain of rayon fabrics weaving industry, where 60 per cent of the total production was done by wage earners.

As regards the 1958 exports of silk and rayon fabrics: the total amounted to $130 million, of which $33 million (65 million square yards) was silk fabrics; rayon fabrics amounted to $66 million (384 million square yards); the second stage products amounted to $30 million (137 million square yards).

In the case of silk woven goods, only one-third is exported, the remainder of two-thirds being for the domestic consumption. *Habutae* comes to top in the export trade, amounting to 27 per cent of the total exports, followed by organdie (16 per cent) and Fuji silk (13 per cent).

The United States is by far the largest customer of Japan's silk fabrics, taking 80 per cent of the total exports. Others take less than 10 per cent of the total. In recent years, however, exports to the United States are subject to certain restrictions resulting from excessive underselling among Japanese commercial houses. Furthermore, frequent fluctuations of the raw silk prices at home show a tendency to affect the silk fabric trade adversely; the export is on the decline.

It is rayon fabrics whose ratio of exports to production is the highest; nearly 50 per cent of the output is sold abroad. As regards the types of fabrics popular abroad, they include fujiette, satin, voile, *shioze*, and taffeta. It is mainly to Southeast Asian countries and the Middle and Near East that rayon fabrics are exported. In recent years, however, business is not quite active.

In March 1958, Japan Rayon Textile Export Promotion Co. was organized to carry out control over production, export and price on three principal items of rayon products, viz., fujiette, satin and *shioze* in order to regulate the manner of transactions, thereby to improve trade.

The production equipment is the next subject: in 1959, there were 212,000 power looms, 50,000-hand looms, or a total of 262,000 units.

In the silk and rayon fabrics industry, it is most strongly required that the variety of products should be unified and that their quality should be improved, along with the improvement of productive equipment. Reflecting such general requirements, a change from the semi-wooden looms to iron framed looms has been going on, together with

the installation of more automatic looms. Thrasher-sizing machines are being installed in different communities as joint enterprises of cooperative organizations.

The scrapping of excessive equipment is also carried out as a basic measure of dealing with the current business inactivity. By virtue of the Textile Industries Equipment Extraordinary Measures Law promulgated in June 1953, the Silk and Rayon Fabrics Industrial Readjustment Federation of Japan started to scrap 33,000 excessive units. During fiscal 1956, a total of 4,300 units (in terms of wide fabric weaving looms) were to be scrapped; 5,000 units in 1957 and 15,000 units in 1918.

On the other hand, some restrictions were exercised on the new installment of looms by virtue of the MITI (Ministry of International Trade and Industry) ordinance of April 1958 in Japan's silk and rayon fabrics weaving industry. Moreover, in September of the same year, regulations pertaining to the new installation of looms were worked out by virtue of the Smaller Industries Associations Law, with a result that weavers were prohibited to expand their productive capacity.

The disposal of excessive looms is designed to prevent the further decline of the market quotations of products and thereby account for the recovery of business. On the other hand, there is the system of granting subsidies to industrial modernization efforts. It is expected that these two measures may contribute materially towards stabilization of the silk and rayon fabrics weaving industry.

*3) Trends in the Future*

Over-production is always said to be the fundamental cause of business inactivities in Japan's silk and rayon fabrics manufacturing industry. Consequently, the Silk and Rayon Fabric Industrial Federation of Japan has inaugurated the organized activities of production readjustment as well as the system of restricting the number of looms by having them registered, with a view to stabilizing the market quotation of woven fabrics.

Just recently, however, the rayon filament yarn makers' production curtailment has proved a success, with the result that the market quotation of rayon filament yarns has shown a remarkable improvement. Meanwhile the fabrics market is unable to catch up with the improvement of the yarn market. Weavers, therefore, find it difficult to carry on profitable operation of their business.

During this time, the stock on hand of three principal items of rayon fabrics is increasing at the Japan Rayon Fabrics Export Promotion Corporation which is the sole agency to purchase the entire production of export rayon fabrics. The increase of stock has inevitably produced unfavorable effects upon the export, and it by turn has delivered a blow to smaller weavers. As a measure to deal with such a situation, all parties concerned express the hope that the Government will take a special measure, such as export on a long term deferred paymnt basis.

Another recent trend is that the controlling influence of major rayon filament yarn makers over the smaller weavers has become augmented in such a manner that the major manufacturers list services of these smaller enterprises within the system of their affiliated or subsidiary enterprises.

**Table 1: Number of Enterprises and Employees of Silk and Rayon Fabric Industry Classified by Scale of Operation**

| Scale | No. of enterprises | No. of employees |
|---|---|---|
| 1— 3 persons | 17,942 | 37,710 |
| 4— 9 | 3,453 | 21,897 |
| 10— 19 | 2,214 | 29,893 |
| 20— 29 | 779 | 18,541 |
| 30— 49 | 579 | 21,761 |
| 50— 99 | 280 | 18,979 |
| 100—199 | 85 | 11,494 |
| 200—299 | 17 | 4,252 |
| 300—499 | 16 | 5,958 |
| 500—999 | 9 | 7,137 |
| Over 1,000 | 1 | *x* |
| TOTAL | 25,380 | 177,622 |

**Source:** Census of Manufactures (1957) by Ministry of International Trade and Industry.

## 3. Dyeing and Processing

### *1) Development of Dyeing and Processing Industry*

It has been explained so far that the cotton and silk goods are produced after going through different stages of processing into finished products. It is, however, the quality of the end products that determines the market value of the respective merchandise. Consequently, the dyeing and processing industry, which gives the finishing touch to the merchandise, plays a highly important part in the whole process of production.

It is in and after the Meiji Era (1868-1912) that imported chemical dye stuffs have come into use, to take the place of the plant dye materials. At the beginning, however, the imported dyestuffs were used only in the dyeing of low grade products.

After the turn of the present century, however, the dyeing as an enterprise began showing notable development; the scale of enterprise also progressed from that of extremely small domestic cottage industry to large capitalistic undertaking.

There appeared a number of factories which specialize in machine printing and also bleaching which is the preparatory course for the dyeing, even though their scale of operation was still very small, and their productive activities were limited mainly to the processing of material for the domestic consumption. They were not prepared to handle export goods.

It was during World War I that Japan's dyeing and processing in-

dustry made a spectacular development. The war accounted for a marked increase in Japanese exports of cotton fabrics. Incidentally, it induced the dyeing mills to handle export goods.

Generally speaking, however, the dyeing and processing enterprise was still in the early stage of transition from the cottage industry to the modern industrial operation of large scale. Their mills were not entirely mechanized yet. Furthermore, most of the enterprises were run on commission basis for wholesalers whose primary concern was to cut down the cost. As the dyeing and processing were thus carried out with the concentrated efforts directed to the reduction of cost, the end products were low quality. They were not at all popular anywhere.

Sometimes there appeared some mills where high standards of processing techniques were maintained. But their business fluctuated according to the seasons; in the absence of a constant flow of work, it was difficult to make it a success as an independent industry. The modernization of the dyeing and processing enterprise was a difficult proposition under such circumstances.

Japan's textile products exported in those days had already reached the international level in quality, and yet there were constant claims coming from foreign countries in connection with dyeing and processing.

It was in the face of such unfortunate development that major cotton spinning companies established the dyeing and processing departments to do their own work in an integrated process, that is, from raw cotton to yarn, fabric and dyeing. In addition, they also began to employ the services of some specialized factories maintaining high technical standards, to be attached to them exclusively.

After World War I, the belligerent nations, who were unable to export their industrial products during the war years, came back to the Oriental markets again, headed by the United Kingdom. Consequently it brought about a substantial decline in Japanese exports of dyed fabrics.

The Japanese cotton spinning industry, however, carried out a thorough-going readjustment of their enterprises in the early part of the Showa Era (1926— ). It coincided with the betterment of the export trade after the Japanese prohibition of gold export for the second time, and Japanese cotton fabrics began to be exported in large quantities again. Incidentally, it facilitated the active export of Japanese dyed fabrics, so much so that the dyed fabrics came to occupy 60 to even 70 per cent of the total cotton goods exports. Meanwhile the dyeing and processing of other kinds of fabrics, such as rayon staple, silk, rayon, woolen and hemp goods, became so active that an unprecedented prosperity was temporarily enjoyed by this specific division of industry.

After World War II broke out, however, the dyeing and processing industry also shared the fate of the cotton and other textile industries. The technical progress also came to a stop during the war years.

In the wake of World War II, a three-year program was worked out to restore Japan's dyeing and processing industry. The General

Headquarters, SCAP also directed the cotton industry to export their products in the finished form as far as possible. A speedy recovery of this processing division was consequently brought about. At present, the dyeing and processing industry has been restored to the level that prevailed previous to the wartime readjustment of the industry carried out in 1942.

*2) Production Structure of Dyeing and Processing Industry*

What is meant by the term dyeing and processing implies the bleaching, soak dyeing, printing and finishing. This industry was originally started in the manner of production on order and it is operated on commission basis even at present.

The Japanese Textile Dyers Association reports that the number of factories in 1958 was 391, as shown in Table 1. Of this total, those operated by major cotton spinning companies were only 21 in number, the remainder being mostly those specializing in dyeing and processing.

Classified according to the scale of enterprise, those under the direct management of major cotton spinning companies employed more than 300 mill hands, especially in the case of this industry being additionally run by the ten major cotton spinning companies. On the other hand, up to 50 per cent of those specializing in dyeing and processing were of small scale, employing from one to 49 persons.

At the dyeing and processing mills operated by major cotton spinning companies, as well as at large factories specializing in this particular line of business, their work is concentrated on the dyeing of cotton, rayon staple and synthetic fiber fabrics. On the other hand, smaller factories took charge of the dyeing and processing of all kinds of fabrics. But a recent trend at factories operated by cotton spinning companies is that they concentrate more on tentering and bleaching which can be carried out on mass-production basis, in view of the fact that individual order-lots have become smaller, since more complicated patterns and printings have come to be required.

The yearly amount of work done in 1958 by the dyeing and processing was 4,430 million square yards, including 2,500 million square yards for the export and 1,930 million square yards for domestic consumption.

Classified according to the kinds of fabrics, the dyeing and processing of cotton goods were overwhelmingly large, followed by that of rayon staple, rayon and silk fabrics. (See Table 2)

In recent years, however, work that involves still higher standards of techniques is increasing, e.g., the resin treatment of such items known as sunforized and "Everglaze" fabrics, silket processing, etc. There has been a great improvement in the dyeing so that the colors are fast, and the finish is better.

*3) Techniques of Dyeing and Processing Industry*

The dyeing and processing industry of Japan originates in the handi-

craft art of home-enterprise. As the result, the processing techniques gained by experience were more valued than mechanical equipment. In recent years, however, the competition in the overseas market, together with the changes in fashion, better dyeing (such as fastness of colors) and modernization of the processing mechanical equipment are considered greater importance. That is, uniformity in the quality of finished products by operation of certain designated mechanical equipment, an increase in market prices, and modernization of the processing equipment in order to give additional values to finished products are among the principal requirements for this industry. It means the installation of better machines.

In case of tentering and bleaching of cotton fabrics, it used to require two days to complete a certain unit amount of work; but it is done within a matter of two or three hours by the use of better modern machines, through integrated continuous operation. New machines which can perform continuous dyeing, automatic screen printing, sanforized fishing, silket operation, etc. are now in great demand.

The importance of dyeing and processing is recognized by the Government. As soon as the legislative measures encouraging the industrial readjustments and improvement of this industry (the law for encouraging the rationalization of enterprises) are put into practice, special redemption of new mechanical equipment is recognized through special tax measures; the import duties are then exempted for specially important mechanical equipment for the modernization of this industry; and the Development Bank of Japan is directed to finance the installation of better processing equipment.

*4) Trends for the Future*

It is the dyeing and processing industry which is the most backward in its development among Japan's textile industrial enterprises. It is attributed mainly to the fact that the postwar recovery of this industry was centered about processing equipment for low grade of work, both for the export and domestic consumption; the work done in those early postwar years, moreover, was of low grade in the main.

But the situation is different at present. The competition in export markets calls for modernization of processing equipment, just as much as improvement in processing techniques. And the industry as a whole shows a tendency to progress toward that end. But then the industry faces such formidable obstacles as high-priced dyestuffs.

Dyestuffs and a variety of chemicals are used in large quantities as raw materials for dyeing and processing, and they are considerably high priced in Japan as compared with the prevailing price levels abroad. Naturally, it makes the operation cost higher.

In the breakdown of dyeing and processing costs, dyestuffs have always constituted a high percentage; it used to take 30 per cent of the total in the ordinary grade of work, and from 50 to even 60 per cent of the total in the high grade of processing work. Consequently, high prices

of dyestuffs produce decisive effects upon the total composition of costs.

In view of the foregoing situation, the Japanese Government follows the policy to foster Japan's dyestuffs manufacturing industry, through discouraging imports of low-priced foreign dyestuffs into Japan via customs manipulations. On the other hand, the protection of the domestic dyestuffs manufacturing industry has resulted in adverse effects on Japan's dyeing and processing industry.

It is envisaged, in the meantime, that much of this question will see an amicable solution, in view of the prospective liberalization of foreign trade in the near future.

**Table 1: Dyeing and Processing by Kinds of Fabrics and Scales of Operation (1958)**

| Scale | Factories specializing in dyeing | | Factories operated by cotton spinning companies | | Totals | |
|---|---|---|---|---|---|---|
| | No. of factories | No. of employees | No. of factories | No. of employees | No. of factories | No. of employees |
| 1— 49 ..... | 174 | 4,148 | — | — | 174 | 4,148 |
| 50— 99 ..... | 70 | 5,143 | 1 | 95 | 71 | 5,238 |
| 100—149 ..... | 40 | 5,053 | 4 | 530 | 44 | 5,583 |
| 150—199 ..... | 27 | 4,732 | 1 | 190 | 28 | 4,922 |
| 200—299 ..... | 28 | 6,558 | 5 | 1,287 | 33 | 7,845 |
| 300—499 ..... | 21 | 8,437 | 4 | 1,699 | 25 | 10,137 |
| Over 500 ..... | 10 | 7,424 | 6 | 4,989 | 16 | 12,413 |
| TOTAL..... | 370 | 41,496 | 21 | 8,790 | 391 | 50,286 |

**Source:** Japanese Textile Dyers Association.

**Table 2: Dyeing and Processing by Kinds of Fabrics (1958)**

(Unit: 1,000 square yards)

| Items | for Export | Domestic consumption | Total |
|---|---|---|---|
| Cotton ..... | 1,234,019 | 1,265,410 | 2,499,429 |
| Hemp ..... | 2,617 | 30,531 | 33,148 |
| Silk ..... | 112,813 | 59,971 | 172,784 |
| Spun silk..... | 5,249 | 7,337 | 12,586 |
| Rayon ..... | 427,450 | 215,729 | 643,179 |
| Rayon staple ..... | 686,230 | 194,737 | 880,967 |
| Synthetic fibers ..... | 14,410 | 122,819 | 137,227 |
| Acetate..... | 14,006 | 36,138 | 50,144 |

**Source:** Fiber Statistics Research Office, MITI.

# II.

## Machinery Industry

### 1. Tool Industry

*1) Development of Tool Industry*

Tools assume the character of the basic part of the machinery industries, specifically machine tools (those machines which manufacture machines), and their precision and durability constitute vital factors governing the productivity of the machine tool industry. In the history of development, it was seen, tools and machine tools had stimulated each other's progress. Hence, the historical development of the tool industry cannot be studied separately from machinery industries, especially machine tools.

The Japanese machinery industries, particularly the machine tool industry, was considerably lagging behind other industries in advancement. In Japan's capitalism, military production requirements forced importation of foreign machine tools, and the home production of machine tools were left ignored for quite some time.

The history of the importation of foreign machine tools dates back to the latter part of the Tokugawa Era. In the first place, several machine tools of Dutch make were imported by the Nagasaki Shipyard in 1856, followed by some Dutch machine tools which the Shuseikan of the Satsuma clan bought in 1863 and French machine tools which the Yokosuka Shipyard imported in 1866. Even after the Meiji Restoration, the Army and Navy arsenals and private machinery plants were all dependent on machine tool imports, and domestic production was negligible. The home production of machine tools commenced at Ikegai Iron Works in 1889. At that time Ikegai Iron Works started with only two apprentices and 6 ft and 12 ft lathes of British type (two units), and its production was limited to its own use. But anyway the 9 ft lathe of British type which Ikegai Iron Works completed at the time of the founding of the company merits special note as the first machine tool manufactured in Japan. In 1898, the company imported a #2 type all-purpose fraise made in Cincinnati, 20 inch Burns drilling machine, gear shavers, etc. to start production of machines of Anglo-American types.

Afterwards the manufacture of planers, drilling machines and the like gradually came to be started, and it was the Russo-Japanese War, which required various types of arms in quantities, that spurred demands for machine tools. Along with the importation of foreign machine tools, technicians were invited from abroad one after another to render vocational training at schools. The resultant improvement in techniques concerning the manufacturing of machine tools was remarkable. In 1907

to 1912, three other manufacturers joined Ikegai Iron Works in manufacturing machine tools at home, and the domestic production of machine tools showed a notable development, gradually reducing imports. During this period, it must be admitted, however, domestic supplies were meeting only limited demands, and the principal factories still heavily counted on foreign machine tools such as lathes, fraises and drilling machines. Tools for these machines were imported mainly from the Netherlands, France and Britain. Of course this is not to say that tools were not manufactured at all in the Meiji Era. In fact, the Naval arsenal was trying to manufacture such tools around 1883; in 1905, Yawata Iron and Steel Works already started the manufacture of tools while making base metal for rifle barrels, by adopting the crucible steel making method; and in the same year, Kobe Steel also began to produce drills. All these, however, were exclusively for the private uses of these manufacturers.

At the time of the fifth industrial exposition held in Osaka in 1903, or directly before the outbreak of the Russo-Japanese War, such new products as twist drills, micrometers and various gauges were introduced. The then standards of technology in Japan were such that people were watching, in mute astonishment, hacksaws cutting and shaving steel with ease.

With the outbreak of World War I as a turning point, the Japanese machine industry made great strides. The suspension of the importation of machinery and equipment indispensable to expansion of munitions production, especially machine tools, also served to stimulate the industry's activities. Factories specializing in production of machine tools were established, thus laying the foundations of the Japanese machine tool industry.

It was about that time that tools came to command the recognition of industrialists, and their production on an entrepreneural basis began to be thought of. In 1916 Sonoike Seisakusho was established as the first factory to specialize in tool manufacture. Although Kobe Steel was marketing tools a little before Sonoike Seisakusho did, yet it deserved no particular mention because the amount of tools put on the market was a mere trifle. Following this, Ikegai Iron Works and several other private enterprises commenced the manufacture of tools.

With the termination of World War I and a general slump in the machinery industries, demands for tools were on the wane, and business was inactive. However, thanks to demands from the military and National Railways, the tool industry could manage to keep its head above water.

From about 1927, when Karatsu Iron Works in Kyushu started the production of tap dice and micrometers, the machinery industry came to turn out quality products and the importance of tools began to be widely recognized. During this period of time, the production of tools was in comparatively satisfactory shape, and there were signs of business looking up. Occurence of the Manchurian Incident in 1931 placed the machinery industry under a wartime emergency state. To meet increasing

military requirements, all industries busied themselves with installation of machine tools, with the result that domestic supplies of machine tools ran short. Large-scale industries, too, embarked upon the production of machine tools to cope with the situation, and consequently, the tool industry was able to show marked development under government protection and encouragement.

Due to swelling wartime production demands brought on by the Sino-Japanese War of 1937, the supply of basic materials began to show signs of an acute shortage. The Ministry of Commerce and Industry proclaimed the regulations concerning distribution of iron and steel and introduced a coupon system for special steel materials and non-ferrous metals for the machinery industries. Manufacturers were therefore able to obtain their necessary materials only by means of ration certificates issued by special bodies designated by the Minister of Commerce and Industry. The Army and Navy, on their own parts, moved to foster factories under their management and supervision in order to secure their military procurements, and in 1939, instituted regulations curbing installation of machinery and equipment in factories manufacturing non-essential goods and also in technically retarded industries. These regulations applied to the tool industry, too, and checked the advance of smaller enterprises in this particular field.

As war progressed, a plan to disperse factories was worked out, and the "thinning out' or removal of machinery and equipment ensued. After skilled workers were drafted into the army, volunteer corps took their place, but production dropped rather than increased.

The postwar recovery of the tool industry was delayed by large stocks of tools released by the military arsenals and munitions companies. Gross national product of 1948 was a bare one-tenth of the prewar peak. Under the Dodge policy of 1949, demands for tools hit the ceiling, and production declined.

The outbreak of the Korean Incident in 1950, however, injected a new sap of life into the Japanese tool industry and put it back on its feet again. Domestic industries were generally animated by U.S. military procurement orders, and the tool industry was no exception. Entering 1961, the production of tools began to increase month after month.

As Korean truce talks started, domestic industrial activities slowed down. But the steady implementation of industrial rationalization programs in key industries animated the machinery industries, and ambitious electric power development programs kept them abuzz. Among machinery industries, the production of automobiles showed a record increase.

Reflecting this general buoyancy, the tool industry also shared the boom. In 1951, its annual production, except that of some tools, registered a postwar record high, or close to the level of around 1941. In 1954, the tool industry was buffeted by credit-squeeze measures, and its output continued to drop. This downtrend lasted until the first half of 1955. But the industry wriggled out of the depressive state of business in the

second half of the year, and, buttressed by increasing industrial investments and lively activities of other industries, solidified its foundations.

*2) Production Structure of Tool Industry*

As of February 1960, according to the Japan Tool Industry Association, there were 72 enterprises engaged in the manufacture of tools, employing a total of 6,500 workers. Table 1 shows, by defining enterprises of less than ¥100 million in capital as small and medium enterprises, the breakdown of these tool-manufacturing enterprises according to the size of capital, number of employees, and production shares. Capital-wise, the majority of these enterprises pertain to the category of small and medium enterprises capitalized at less than ¥100 million, while only nine are capitalized at more than ¥100 million. In terms of the number of employees, large enterprises account for 36 per cent (2,351 workers), and the other small and medium enterprises, the remaining 64 per cent (4,149 persons). These large enterprises account for 49 per cent of the total production. This means that small-medium and large enterprises divide production almost equally.

**Table 1: Tool Making Enterprises by Capital Size**

| Capital Scale | No. of enterprises | No. of employees | Production share |
|---|---|---|---|
| Over ¥500 million | 8 | 1,974 | 4.2% |
| 〃 ¥100 〃 | 1 | 377 | 7.0 |
| 〃 ¥ 10 〃 | 13 | 1,842 | 24.4 |
| 〃 ¥ 5 〃 | 10 | 802 | 10.9 |
| 〃 ¥ 1 〃 | 26 | 1,209 | 13.4 |
| Less than ¥1 million | 14 | 296 | 2.3 |
| TOTAL | 72 | 6,500 | 100.0% |

**Source:** Japan Tool Industry Association (As of end-February 1960).

Item-wise, a large number of enterprises are engaged in the manufacture of reamers and milling cutters, and their number is 32; drills are being manufactured by 11 enterprises. In terms of production share, 65 to 68 per cent of the total production of drills and cutters are being manufactured by larger enterprises, while small and medium factories account for roughly 65 to 80 per cent of the total production of reamers, tap dice, and bites (See Table 2).

**Table 2: Production Share by Item**

| Item | Large enterprises | Small-medium enterprises |
|---|---|---|
| Drills | 68 % | 32 % |
| Reamers | 35 | 65 |
| Cutters | 65 | 35 |
| Tap dice | 20 | 80 |
| Bites | 30 | 70 |

**Source:** Japan Tool Industry Association (As of end-February 1960).

Table 3 indicates the recent production trend of special steel tools.

The production soared to ¥5.7 billion by 1957, or 2.5 times 1955 when it recorded ¥2.3 billion. In 1958, machinery industries suffered a setback when excessive investments in inventories and industrial facilities in allied industries came to pose problems. Some of the tool-making enterprises needed inventory adjustments, and the tool production dropped to ¥4.9 billion, a decline of ¥800 million from the previous year. But even this production level was two times as high as 1955.

Inventory adjustments which lasted till the first half of 1959 resulted in bringing down inventories to 20 per cent of the 1958 level, and production began to pick up along with the lively business of the machinery industries. By the end of 1959, production eventually reached the ¥5,600 million mark, barely missing the postwar peak established in 1957. Production kept on soaring from the very beginning of 1960, and amounted to nearly ¥4,000 million even during the first six months of the year. The 1960 production was expected to reach the ¥10 billion mark.

**Table 3: Production of Special Steel Tools**

(Unit: ¥1 million)

| Item | Year | | | | | |
|---|---|---|---|---|---|---|
| | 1955 | 1956 | 1957 | 1958 | 1959 | 1960 Jan.–June |
| Drills | 869 | 1,247 | 2,096 | 1,628 | 1,889 | 1,410 |
| Reamers | 138 | 221 | 439 | 388 | 414 | 290 |
| Gear cutters | 450 | 503 | 876 | 857 | 823 | 584 |
| Milling cutters | 285 | 462 | 904 | 652 | 790 | 568 |
| Tap dice | 437 | 521 | 830 | 930 | 1,163 | 757 |
| | 53 | 61 | 109 | 72 | 73 | est. 40 |
| Bites | 91 | 221 | 466 | 366 | 436 | 337 |
| TOTAL | 2,323 | 3,236 | 5,720 | 4,893 | 5,588 | 3,986 |

**Source:** Japan Tool Industry Association.

The market for tools is vast, but the center of the demand is, needless to say, machinery industries, especially automobile and electrical machinery industries as well as National Railways. Annual exports are valued at approximately ¥200 million, and major destinations are countries in Central and South America and Southeast Asia. Principal export items are cutting and chiseling tools. Imports are a mere trifle in comparison with the total production, but major suppliers are West Germany, the United States and Switzerland. Chief import items are drills of less than 2 mm in diameter for precision machinery industries and special gear cutters for automobile and electrical machinery industries. Recently, however, domestic manufacturers have become able to manufacture tools no inferior to foreign products by pulling down production costs, improving designing and manufacturing techniques and conducting research on basic materials.

Of the various machines and equipment used in the production of tools, lathes count for much, accounting for 33.9 per cent of the total. They are followed by planers (25.2 per cent), fraises (18.2 per cent) and drilling machines (11.8 per cent). Speaking of machinery industries

in general, lathes are always "infringing" the domains of other tools as all-purpose tools. In the field of tool production, the ratio of lathes to planers is almost balanced, which proves how the tool industry necessitates precision processing equipment.

In respect to the machinery and equipment of the tool industry, about half of the facilities now in use have reached their life limit; this shows how low the productivity of machinery and equipment in the tool industry is.

Since the extraordinary law on the promotion of machinery industries was enacted in June 1956, the tool industry has come under the purview of this law, and has been gradually marching towards industrial modernization. It must be pointed out, however, that as the ratio of reserve funds or profit surplus funds against capital in the tool industry is far lower than in other industries, the installation of modern machinery and equipment with own capital for rationalization purposes has been making little progress.

In recent years, the considerable improvement of the precision of machine tools, notable increase in the planing efficiency, and rich diversity of planed materials have come to call for such steel as molybdenum and vanadium high-speed steel especially for drills and cutters. Now that the domestic manufacture of high-speed steel is still in the experimental stage, the tool industry depends increasingly upon foreign materials.

*3) Conclusion* .....

As stated earlier, the ratio of reserves and other profit surpluses against capital is low, and furthermore a wide variety of products are being manufactured in small quantities. Under these circumstances, monopolistic large enterprises have not emerged, and no competition with large enterprises has been seen. The fact that tool-manufacturing enterprises need a fairly large scale of machinery and equipment is responsible for no sharp increase in the number of enterprises in the particular field of industry and no cutthroat competition among enterprises as often seen in other industries. The tool industry is presently enjoying a seller's market, and the overall market situation is stable.

The biggest problem facing the Japanese tool industry today is on trade liberalization. To understand the depth of this problem, one must realize the fact that the tool industry is heavily dependent on steel materials which account for one-third of the total production cost. In the present seller's market, a rise in the prices of already expensive basic steel materials, specifically high-speed steel, could be covered by hiking the prices of finished products. In so doing, however, the industry will raise the domestic market prices above the international market level. The freer inflow of foreign products by means of trade liberalization measures will most likely create a buyer's market, and inevitably domestic products will be put at a great disadvantage.

## 2. History of Farming Machine Industry

The manufacturing of farming machines in Japan laid its foundation as a modern industry around 1930, emerging from the stage of simple manual work at the hands of village blacksmiths. Until then, the production of farm appliances had been no more than petty homework by blacksmiths just meeting the local requirements of agricultural pursuits. Then, how did Japan's farm machine industry achieve its historical progress?

The history of the development of farm machines in Japan dates back to the Meiji Era (1867-1912), especially in the first half of the era, when plowing implements such as ox-and-horse driven cultivators and cultivator-eradicators took great strides in their progress. In the Taisho Era (1913-1926) and the early part of the Showa Era (1927- ), threshing implements showed spectacular growth outmatching plowing machines in the tempo of development.

Such a changing picture in the farm machine industry was attributed to the increased marketability of rice. Accompanied by the establishment of the rice inspection system, the expansion of the rice market made it imperative for farmers to sell quality rice.

Japanese farmers in those days had considerable difficulty in threshing rice. Throughout the Meiji Era, however, thrashing implements could not go beyond the confines of such old prototypes as "Semba Inekoki," which was invented in the Genroku Period (1688-1703).

The threshing implement called "Semba Inekoki" consisted simply of tongs planted onto the block, through which farmers pulled rice sheaves and stripped off rice ears.

Towards the end of the Meiji Era, the rotary treadle-thresher made its debut. With the spread of this new type of thresher, out-moded "Semba Inekoki" models faded away.

Despite this notable advance in the field of farm implements, the period of agricultural implements dependent on human as well as animal power continued until the Taisho Era. In Japan, petroleum engines were put to practical use for the first time around 1884, and it was around 1897 that the home production of oil engines was started by Ikegai Iron Works and Niigata Iron Works. The use of petroleum engines, however, was limited to industrial purposes.

The outbreak of World War I, however, brought a prosperity and an acute labor shortage to the farming communities and spurred the demand for handy small-sized engines. Around 1920, domestic engines began to appear on the market. In parallel with the manufacturing of these engines, the production of small engines for agricultural purposes began to burgeon around 1925.

On the other hand, from the end of the Taisho Era to the early part of the Showa Era, the electric power industry represented by five big power companies (Toden, Toho, Daido, Nichiden and Ujiden) sought

outlets for its surplus power supply in the farming districts. Against such a historical background, the home production of small motors for agricultural use was accelerated until around 1942, when the industry experienced a serious shortage of raw materials. Motors came into the first practical use in the processing of farm produce such as tea-manufacturing, and then in the fields of pumping and threshing implements. It was around 1923, when a plan for greater wheat production was worked out, that full-fledged use of motive power began for threshing machines. Thus, with 1930 as a turning point, the farm machine industry solidified its foundation as a modern industry.

Keeping pace with the rapid diffusion of electricity, the manufacturing of power-driven threshers, automatic rice-hulling machines and automatic rice polishers came to be mass-produced and these farm implements penetrated deeply into villages.

Contrary to the marvelous growth that threshing implements showed, plowing and cultivating machines had made moderate progress. However, the outbreak of the Sino-Japanese Incident in 1937 and the resultant shortage of labor force on the farm stimulated demands for plowing machines tremendously.

On the strength of the ever-rising demand, mechanization of cultivation process made remarkable development, and screw-type and crank-type cultivators were also invented. Later on, the Japanese farm machine industry achieved marked progress year after year developing fast from the stage of primitive farming tools and then experienced World War II.

Under a quasi-war structure, the industry enjoyed an unprecedented boom and expanding business activities, as a severe shortage of manpower on the farm added fuel to agricultural mechanization. It was not so long, however, before the agricultural machinery industry began to be eclipsed by the munitions production in spite of snowballing demands from the farming population. Although relatively great importance was attached to the industry from the standpoint of stape food supply, yet the industry was on the wane in the face of the "supreme order" of war industries.

As a result of the switchover of farm machine plants and blacksmiths to munitions factories, the number of farm implement works fell sharply. Their number actually dropped to 1,214 by 1945 from about 2,096 in 1940. The number of blacksmiths also decreased to 12,000 from 20,560 in 1940.

Iron and steel materials for the farming machine production was a far cry to the necessary amount, and their supplies continued to shrink year by year. Not only that, the amount of raw materials actually provided to farm machine manufacturers was far less than nominal quotas. Inevitably, therefore, the production of agricultural implements was on the decrease.

After the end of World War II, the switch of munitions factories to

peace-time industries and short supplies of foodstuffs brought about a sudden increase in the number of farm machine makers. In 1946, the number of farm machine plants and blacksmiths recovered the prewar level, reaching 2,096 and 17,890, respectively. However, the severe Dodge Line economic policy dealt another lethal blow to the industry around 1949 when the purchasing power of farmers was extremely low. Stagnant farm machine sales caused business closures or changes of work among farm machine manufacturers. The business sluggishness did not last long, however, and the outbreak of the Korean War altered the picture completely.

Thanks to the stepped-up demand during the Korean War, the production of farming implements soared nine per cent in 1951 over the preceding year. Entering 1952 and 1953, shipments of farm implements kept on soaring steeply notwithstanding a feared drop in farmers' income as a result of storm and flood damage. High rice price policies, farmers' fads for agricultural mechanization and Government encouragement of the production of farm implements all combined to give new vigor to the farm machine industry.

Shipments of farm appliances, therefore, registered an 18 per cent rise in 1952 over the previous year, and in 1953, they further recorded a 32 per cent increase over 1952. Furthermore, the farm machine industry could remain free much of the impact of deflationary policies since 1953. Demands for farm machines centering on power-driven sprayers, power dusters and cultivators continued to increase even in 1954. Entering the latter half of 1954, however, signs of business slump began to be spotted. Cash payments decreased, payments by bills increased markedly, bills had longer days to run, collection of loans was aggravated, production topped shipments, and inventories bulged.

This trend remained prominent in 1955. Manufacturers were compelled to take makeshift measures to tide over the situation—such as operation curtailments, personnel retrenchments, adjustments of inventories and the refraining from purchases of raw materials.

Bumper rice crops in the autumn of 1955, however, resurrected the farm machine industry from the doldrums and ever since the industry has been continuing to buzz on the strength of the upsurge of farmers' purchasing power.

## Production Structure Of Farm Machine Industry

According to the Industrial Statistics compiled for fiscal 1957, the number of workshops for machines and implements for agricultural purposes reached 1,779. Eight out of the above workshops employed more than 300 hands each, accounting for 14 per cent of the total employees and 23 per cent of the total farm machine shipments.

As described above, the majority of farm machine manufacturers belongs to the category of small and medium enterprises. Large manufacturers occupy only small part of the industry. However, there is no wide gap in scale between large and small factories. In the manufactur-

ing of agricultural implements, the operation rate of facilities is low, and dependence on other industries is heavy. Assembly makers represented by largr enterprises are therefore standing in close relations with smaller enterprises largely dependent on the production of parts.

**Table 1: Farm Machine Enterprises by Scale**

| Scale | Workshops | No. of employees | Shipment Value (¥1 million) |
|---|---|---|---|
| Over 3 hands..... | 734 | 1,686 | 673 |
| 4— 9 ..... | 427 | 2,703 | 1,205 |
| 10— 19 ..... | 296 | 4,023 | 2,318 |
| 20— 29 ..... | 121 | 2,889 | 2,087 |
| 30— 39 ..... | 78 | 2,983 | 3,394 |
| 50— 59 ..... | 68 | 4,549 | 5,189 |
| 100—199 ..... | 30 | 4,167 | 5,827 |
| 200—299 ..... | 17 | 4,165 | 7,742 |
| 300—499 ..... | 5 | 1,847 | 2,350 |
| 500—999 ..... | 3 | 2,604 | 3,561 |
| TOTAL ..... | 1,779 | 31,616 | 34,348 |

**Source:** Industrial Statistics for 1957.

According to a survey conducted by the Japan Farm Machine Industry Association, the production of farm machines has been drawing a steady upcurve since the war's end. It showed a marked increase at the time of the so-called "Jimmu Keiki" boom (the biggest boom since the dawn of the country) from 1956 to 1957. In 1957, production dipped due to credit squeeze and other deflationary policies, but soon turned upwards.

**Table 2: Output of Agricultural Implements**

| Year | Tonnage of products | Value of production (¥1,000) |
|---|---|---|
| 1951 ..... | 67,464 | 10,238,316 |
| 52 ..... | 75,751 | 13,135,562 |
| 53 ..... | 97,652 | 18,680,174 |
| 54 ..... | 95,705 | 20,184,857 |
| 55 ..... | 82,494 | 18,013,460 |
| 56 ..... | 90,940 | 23,060,000 |
| 57 ..... | 92,602 | 30,429,135 |
| 58 ..... | 83,310 | 27,454,250 |

**Source:** Japan Farm Machine Industry Association.

As a result of this marked production increase, agricultural implements were spread widely in rural districts after the war. Shipments of rice-hulling machines averaged 50,000 units a year since 1950, and those of threshing machines reached 228,000 units. Thus power-driven threshing machines in use totaled 30,000 units in 1927, topped 100,000 units by 1936, rose to 1 million units by 1952 from 300,000 units at the time of war's end, and increased further to 2 million units in 1956. Today it is considered that about 46 per cent of the nation's farm households (6 million) are using these machines. In other words, one out of every two farm households owns a threshing machine.

The number of rice-hulling machines was a bare 40,000 in 1920, rose to 100,000 in 1934, totaled 170,000 when the war ended, climbed to 300,000 in 1949, and further increased to 500,000 in 1953. At present the number has soared to 800,000 units. The means that almost one out of every seven to eight farm households owns a rice-hulling machine nowadays.

Cultivators may be regarded as the No. 1 postwar addition to the farm implements. Their production totaled a mere 3,000 units in 1950, but has soared nearly 50 times in the ten years since then. Unlike threshers and rice-hulling machines, cultivators whose object of operation is earth have universal use. The fast-diffusing cultivators are playing an important role in increasing mobility in agriculture. They enable farmers to save manpower by 50 per cent and animal power by three-fourths in husbandry. Thus cultivating machines have been fast winning great popularity among farmers.

It is to be regretted, however, that Japan's agricultural structure arrests further advancement of convenient cultivators. The fact that arable lands are partitioned into many small lots subserves no full use of cultivators. Farmers owning less than one hectare of land are practically unable to take full advantage of power-driven cultivators. Such domestic factors will inevitably turn the eyes of farm machine manufacturers to foreign markets. Exports of farm machines, however, amounted to only ¥1,230 million, or a disappointing 0.4 per cent of the total shipments. It is an indisputable fact that the Japanese farm machine industry has been buttressed by brisk domestic demands, not exports. Basic reasons for sluggish exports are because of the marked difference in farming methods between Japan and other countries, postwar relations with Korea, China, etc., and still unsolved reparations problems. But these hindrances are nearing solutions, and in fact, exports, including sample exports, are on the sharp increase.

Principal export items include farm appliances, eradicators and threshers. The recent remarkable increase in exports of cultivators must also be mentioned. Area-wise, China (mainland) topped the list with ¥255 million, or 21 per cent of the total. The United States followed China with ¥193 million, or 16 per cent of the total, trailed by the Philippines, the Ryukyus, Formosa, Burma and South Korea in this order. Putting aside the United States, major export markets for Japanese farm machines are all Southeast Asian countries. This means that their agricultural methods bear strong resemblances to those of Japan.

## Conclusion

Agricultural machinery runs the gamut from such handy small types as threshers and dusters driven with human power to power-driven cultivators of high efficiency. Along with the progress of farming mechanization, demands for larger and motorized farm machines are soaring, and trends towards centralization of production are becoming prominent. The future of the small-medium manufacturers seems to depend in large measure upon now these smaller enterprises will cope with these trends.

## 3. Bicycle Industry

### *1) Development of Bicycle Industry*

Bicycles were imported into Japan for the first time in the early part of the Meiji Era. They were solely for recreational purposes. As they were turned to practical use, those who not only imported finished products but also assembled imported parts and accessories came to appear. Some went so far as to manufacture parts for repair. In 1887, Takanawa Bicycle Co. *(Daruma)* started copied production and in the following year, the production of tricycles came to commence. In 1890, Miyata Seisakusho was established in Tokyo to initiate the manufacture of bicycles in Japan, and afterwards the production of bicycles was started in Nagoya and Osaka, too. In the initial stages, bicycles and tricycles were wooden. Bicycle shops sold as well as manufactured bicycles, but they were no better than home industries in the scope of management. It was in 1907-12 that bicycles came to have such outward appearances that they have today. About that time, Osaka Bicycle Co. and several others sprang into existence, and home-made bicycles made their appearance on the market. Although small in number, exports also began. The increase in demands in post Russo-Japanese War years also stimulated the manufacture of bicycle parts, and the production process came to be mechanized. In Sakai, Osaka Prefecuture, a well-known production center of guns and swords, the manufacture of bicycle parts increased notably. Up until towards the close of the Meiji Era, the bicycle industry in Japan was in the inchoate stage, and production was negligible. The domestic demands were for the most part met by imports. Finished products came mainly from Britain, and parts from Germany.

The Japanese bicycle industry could not get rid of the cradle for quite some time, but the stoppage of imports as a result of World War I and brisk orders from China and Southern regions that used to depend on European supplies kept the industry busy and fortified its foundations as an export industry. Domestic demands which prior to World War I had been limited to only select classes expanded fast, embracing virtually all strata of society. As a result of this, the production value increased considerably. As a matter of fact, the number of bicycles produced was 140,000 units in 1918, or about double the 1917 figure (75,000), and further rose to 220,000 in 1921. Large-scale factories were set up one after another, and in 1916, Japan Bicycle Co. (Capital—¥2,500,000; factory hands—700; output 25,000 to 26,000) was founded along with Toyo Chain Co. (Capital—¥300,000; factory hands—80), Nichi-Ei Bicycle Co., and Tokyo Wheeling Industry Co. Factories already in existence also began to expand their facilities. Even such expansion of industrial facilities could not enable the industry to meet the fast-growing demands, and the tendency of sacrificing quality to quantity took place.

With the termination of World War I, the industry suffered a severe reactionary setback and its business slipped into a state of stagnancy. From 1923, production took a sharp downturn. A drop in exports aggravated the situation. Such being the case, the bicycle indus-

try was forced to double efforts for improvement in quality, price cuts, unification of standards, and industrial rationalization.

In the early years of the Showa Era, the bicycle industry, together with other industries, was hit by a domestic financial panic, world panic, the lifting of the gold embargo and a drop in the silver value. These factors narrowed down overseas markets, and resultantly exports dropped. The industry found itself in a severer depression.

Some time later the domestic demands and exports turned upwards, and production began to soar again. Taking advantage of low exchange rates accompanying the re-banning of gold exports, the bicycle industry was able to stretch out its export networks to even China, India and Southern regions. From around 1933, the industry came to export 40 to 50 per cent of its total output. However, the industry was being harassed by increasing prices of basic materials for the manufacture of bicycles such as steel and rubber—high prices which reflected a wartime prosperity since the Manchurian Incident. The skyrocketing prices of steel materials since around 1933 dealt staggering blows to small and medium enterprises, and deteriorated terms of trade on the world market, thereby bringing about a stagnation in export trade.

The development of the Manchurian Incident into the Sino-Japanese War resulted in the loss of one of the major export markets, i.e., China. Simultaneously, the boycott of Japanese goods by Chinese merchants in Southern regions forced Japan's exports to shrink. Domestically, the procurement of raw materials became difficult, prices went up, and manpower became scarce. All these combined to cause a sharp drop in production. During this period of time, all exports were handled exclusively by the Japan Export Bicycle Sales Co. (established in 1939), and domestic supplies by the Japan Bicycle Industry Federation, a joint sales organization (formed in 1940). In doing so, bicycle manufacturers were released from the control of exporters or importers or wholesalers, but the bicycle industry was generally forced to reduce its business scale. The number of manufacturers who changed their business or were driven out of business gradually increased. Since the aforementioned Japan Export Bicycle Sales Co. adopted the plant designation system, mergers of small and medium enterprises made progress, and standardization of bicycle parts and accessories was pushed. Under these circumstances, the bicycle manufacturers of the small and medium scale found their exstence threatened.

Thus the bicycle industry was gradually reorganized. The progress of the Pacific War called for tighter economic controls, pushing industrial rationalization further. In compliance with the directive on consolidation of the bicycle industry (1942), the Japan Bicycle Industry Federation took the initiative in promoting amalgamation of small and medium enterprises according to the kinds of bicycles. In fact, nearly 1,400 factories were consolidated into about 200. As the war situation worsened, the majority of the bicycle factories were converted into subcontract plants for the manufacture of airplanes and other military supplies, and the productive capacity was reduced to half due to war damage.

After the war's end, production recovered with increasing general demands, and topped 2 million units in 1949, or the same level of 1937. The Dodge Line, however, brought about a lowering of the purchasing power, weeding out feeble enterprises and reducing the number of employees by about 20 per cent. The Korean War which broke out in June 1950 saved the bicycle industry from a state of depression, but after June 1951, business was aggravated again, and production shrunk by nearly 30 per cent.

The deflationary policies which went into effect in 1953 resulted in a decline in domestic demands and a slump in export trade. The continued decline in domestic demands compelled the bicycle industry to curtail its production, but production rose in 1955 on the strength of bumper rice crops as well as sluggish exports during the latter half of 1955. It registered a seven per cent rise over 1954. Entering 1956, the industry kept up its production pace, and the first half of the year witnessed an increase of about 15 per cent over the corresponding period of the previous year. Although production rose this much, the business of the industry did not improve from the standpoint of payability.

*2) Production Structure of Bicycle Industry*

The Japanese bicycle industry consists of parts makers, finished product manufacturers, wholesalers, exporters and retailors. Manufacturers are divided into assemblers of finished products and manufacturers of parts and accessories, and none of them do both. As the variety of parts and accessories is very rich, manufacturers of parts and accessories form the nucleus of the pyramid-shaped production structure with manufacturers of finished products at top.

Among the workshops, those employing less than 10 workers account for the majority, while enterprises with more than 500 employees number only four (See Table 1). This fact clearly shows that there are a good number of small and medium scale enterprises in the bicycle industry.

**Table 1: Manufacturers of Bicycles, Rear-Cars, Parts**

| Scale | Workshops | Employees | Production value (¥1 million) |
|---|---|---|---|
| Less than 3 workers | 451 | 1,071 | 653 |
| 4— 9 | 298 | 1,951 | 1,616 |
| 10— 19 | 237 | 3,236 | 3,277 |
| 20— 29 | 123 | 2,953 | 3,166 |
| 30— 49 | 116 | 4,448 | 5,488 |
| 50— 99 | 78 | 5,451 | 7,736 |
| 100—199 | 24 | 3,347 | 5,899 |
| 200—299 | 4 | 934 | 1,064 |
| 300—499 | 2 | 1,886 | 4,028 |
| 500—999 | 2 | *x* | *x* |
| TOTAL | 1,335 | 25,277 | 32,927 |

**Source:** "Industrial Statistics", Ministry of International Trade and Industry (Fiscal 1957).

**Note:** The production values of workshops employing less than three workers are the figures of shipments of manufactured products.

Throughout the country, there are more than 1,000 parts manufacturers, 317 of which employ more than 10 workers each. The parts of bicycles could be classified into frames, handles, mudguards and 13 other parts, and parts manufacturers are subcontracting or sub-subcontracting for manufacturers of finished products. Parts manufacturers gather mainly in Tokyo, Osaka and Nagoya, shipping parts and accessories to manufacturers of finished products, wholesalers and exporters.

The manufacturers of complete bicycles number about 200 in Japan. One group of them manufacture a few parts and accessories by themselves, purchase the other parts from parts manufacturers and assemble them into complete bicycles. The other group buy all the necessary parts and accessories and assemble them into complete bicycles. Most of the wholesalers in production centers belong to the latter group.

In such a production structure, the Japanese bicycle industry made spectacular development after the war's end. Its production already reached the prewar peak in 1950, and the output of complete bicycles finally topped 3 million units by 1959. In prewar years, exports and domestic consumption were well balanced, but after the end of the war, exports accounted for roughly 20 per cent of the total production, although on the gradual increase. The present export scale is roughly 50 per cent of the peak records of 1937. In other words, the postwar production of the bicycle industry owes much to lively domestic demands. In 1959, exports of bicycles rose to $10,570,000, topping the $10 million mark for the first time in eight years since 1951. Of them, complete bicycles numbered 194,000 units, a record high. The United States is importing Japanese bicycles in increasing quantities, and exports to that market totaled 7,000 units in 1958 and 15,000 units in 1959. They are expected to reach 100,000 units in 1963.

*3) Future Direction*

As mentioned above, the postwar increase in the production of bicycles was brought about mainly by brick domestic demands. In fact, demands in farming communities showed a notable increase in reflection of booming economic activities in the first half of 1957, and also demands for bicycles for ladies, cycling, and children soared sharply. In the latter half of the year, however, demands slackened, leading to production cuts and inventory adjustments. Entering 1959, production began to pick up in the first half of the year, but again signs of a slump in sales of new models were seen in the second half. The prices of basic materials of bicycles tended to go up, while the prices of bicycles themselves remained stationary. Under such circumstances, the bicycle industry continued voluntary production curtailments, but the levelling of demands led to a bulging of inventories. To cope with this situation, the industry was forced to push rationalization and is now adopting such new techniques as oil pressure presses, electrostatic coating, and glazing gilt. Industrial rationalization accompanying such technical innovation is being carried out in larger enterprises, but many of the small and medium enterprises still cannot afford to push it. Among

small and medium manufacturers of complete bicycles, there is the tendency of banding together to manufacture, assemble and inspect bicycles and purchase basic materials jointly.

### 4. Casting Industry

#### 1) *Development of Casting Industry*

The history of metal ware in Japan is very old, and ironware made its appearance already in remote ages. However, as metals for casting, copper and bronze were preferred to iron and the casting of bronze bells, Buddha statues and coines were active. It was around 747 that the famous great image of Buddha at Nara was molded. As described in various topographies, the casting and forging of iron were already done in the Nara Period (710—794). Entering the Heian Period (794—1192), cast iron came to be manufactured in various places, and pots and kettles were molded. After the Heian Period, Kawachi became one of the casting centers in the country. Casters in the Kawachi district scattered and settled down in various parts of the country to teach casting techniques. After the Kamakura Period, casting and forging techniques spread to many parts of the country along with the establishment of the iron-making industry.

Under the feudalistic setup of the middle ages, the casting business was operating in the guild system and those specific founders who enjoyed heavy protection by feudalistic landlords were the pivots of the business. Iron pots, kettles and other household utensils were main products at that time, but in the latter part of the Tokugawa Period (1603—1867), even cannons and other weapons came to be cast.

The foregoing guild system survived the Meiji Restoration, but before long it was broken up, resultantly increasing the number of foundries. So long as foundries limit their production to pots, kettles and other household utensils, there were no hopes for further development. Some of them completely went out of the picture after the Meiji Era. Especially after aluminium and enamelled ironware began to be imported, they gradually replaced cast iron utensils. It was at that time that a shift was made from articles of daily use to machinery. Only those production centers which could accomplish this shift managed to catch up with the swift development of capitalism and established their foundations as machinery industries. After the Meiji Era, those foundries which rose up, casting machines gathered in such industrial areas as Osaka, Nagoya and the Tokyo-Yokohama area. They came to constitute the kernel of the Japanese metal-casting industry.

Thus the casting business which had started as a native business manufacturing cast metal articles of daily use gradually transmuted itself into a part of modern machinery industries, and assumed the character of subcontractors manufacturing machine parts.

As a result of this transmutation, the number of enterprises increas-

ed sharply. The spread of electricity encouraged the establishment of small and medium foundries. The number of foundries in Osaka totaled 14 in 1899, only 14 per cent of which were operated with motors. But in 1905, the ratio rose to 60 per cent, 85 per cent in 1919, and 90 per cent in 1926.

In the Showa Era, the output of the metal-casting industry dropped sharply in 1930-32 affected by a business slump, but around 1933, it began to turn upwards again because of wartime demands. In and after 1937 when the Sino-Japanese War occurred, the production of the casting industry which subcontracted directly and indirectly for the manufacture of munitions of war showed a marked increase. Under the semi-war structure of economy and industry, the ratio of the casting of machinery against the total output fast climbed, until it topped 90 per cent after 1938. The casting of articles of daily use was almost banned.

The foundries which had been reorganized as subcontractors for munitions factories during the course of World War II got released from various wartime fetters at the time of war's end, and resumed production. The production centers in the Tokyo-Yokohama area, Osaka, Nagoya and Kuwana suffered considerable war damage, but Kawaguchi, free from bombing, started the production of civilian goods without a moment's delay. Small and medium enterprises which used to be subcontracting for munitions plants during the war had no difficulty in resuming production because they had a large amount of stocks of materials or half-finished products in their hands. A plenty of scrap iron resulting from war devastation and other materials obtainable through blackmarket channels also helped enable the casting industry to lose no time in resuming production. Right after the war's end, public demands for necessities of life were enormous, and therefore the industry found their products such as pots, kettles, frying pans, even plows and spades selling like hot cake. After demands for necessities of life had been almost fulfilled, the industry started extending its production activities to rice-polishing machines, wheat-polishing machines, flour grinders, agricultural implements, hot-bulb engines for fishing vessels, rolling stock and mining equipment and machinery.

Riding on the crest of brisk demands for daily necessities right after the war, the casting industry could start production again, but it was not free from the Dodge Line depression of 1949. Machinery and many other industries were hit by depression business, and substantial personnel retrenchments followed. The metal casting industry was no exception. Not a few factories were forced to close up in the face of a sharp drop in orders.

The Dodge depression, however, was terminated by the Korean War which broke out in June 1950. All industries enjoyed special military procurements directly or indirectly, and helped by lively exports, the Japanese national economy fast expanded its scale. With restrictions on pig iron, cokes, etc. lifted one after another, the casting industry was able to expand its production activities to meet the increased flow of orders from machinery industries. The output of the nation's cast metal

surpassed the 1 million ton mark for the first time, being valued at over ¥50,000 million.

This booming state did not last long, however. After the Korean Incident, business suffered a reactionary setback, and the output of cast metals dropped to 790,000 tons in 1952, or a decline of about 20 per cent from the previous year. In the following year, however, general investments in industrial equipment and machinery began to be animated, machinery orders increased, and the metal-casting production recovered by nearly 20 per cent. The deflationary policies which were taken from the end of 1953 showed themselves in the casting industry in the latter half of 1954. The casting production averaged the 900,000 ton level during the three years from 1953 to 1955. Although this production level was rather higher than 790,000 tons of 1952, small and medium foundries began to feel the pinch of hard times because of the rising prices of raw materials, beating down of subcontract prices, and a shortage of working funds.

In 1956, general investments in industrial facilities turned brisk again, and economic activities reached the "best-ever" point of boom in the autumn of the same year. After 1956, production zoomed again in the casting industry and reached 1,240,000 tons, recovering the 1 million ton level for the first time in five years since the Korean War boom. This economic boom was called the "Jimmu-keiki boom," but it was rather shortlived. Towards the close of 1956, business dropped, and began to assume the character of a "saucer recession" in 1957. The metal casting industry, however, did not feel any impact of the recession because of huge backlogs of orders carried over from the time of the Jimmu-keiki boom, establishing a record high production of 1,430,000 tons (or $120 billion in value).

*2) Production Structure of Casting Industry*

According to the Japan Casting Industry Association, enterprises casting pig iron number 3,600 throughout the country, 2,483 of which are specializing in molding, and the remainder combining casting with shipbuilding, steel-making or other businesses. In the latter group, those enterprises which employ 300 workers or more number as many as 54, including Hitachi, Ltd., Mitsubishi Shipbuilding & Engineering, Tokyo Shibaura Electric Co. and other major electrical machinery manufacturers which are equipped with their own casting facilities. But small and medium enterprises account for more than 99 per cent of the total number, and hence it may be safely said that the metal casting industry is an industry consisting of small and medium enterprises (See Table 1). These enterprises exist mainly in Tokyo, Osaka, Nagoya and their adjacent areas (such as Kawaguchi, Kuwana and Yokkaichi).

Production is being carried out mainly on orders from metal machinery factories in large industrial areas, and unless there are sure prospects of continuous orders, the industry does not manufacture products. Each founder usually have trade relations with more than 10 clients, and there are few which are subcontracting exclusively for certain

machinery makers.

Raw materials are pig iron, scrap iron and scrap steel. Pig iron is being sold by Fuji, Yawata, Nippon Kokan, Nakayama and Amagasaki steel makers, and foundries are purchasing it through the wholesalers designated by these five major steel-makers. Scrap iron and steel are obtained from scrap iron dealers, and they are being imported from the United States with foreign exchange allocations. The annual imports amount to 50,000 to 60,000 tons. As mentioned before, the metal casting production reached 1,430,000 tons in 1957, registering an unprecedented record. In 1958, it dropped in reflection of general business sluggishness, but maintained the 1,160,000 ton level.

**Table 1: Specializing and Side-work Foudries**

| Scale | Specializing foundries | Side-work foundries |
|---|---|---|
| Less than 9 workers | 730 | 398 |
| 10— 19 | 908 | 319 |
| 20— 29 | 399 | 145 |
| 30— 39 | 180 | 75 |
| 40— 49 | 83 | 37 |
| 50— 59 | 59 | 37 |
| 60— 79 | 59 | 27 |
| 80— 99 | 25 | 28 |
| 100—149 | 22 | 41 |
| 150—300 | 13 | 38 |
| Over 300 | | 54 |
| TOTAL | 2,483 | 1,199 |

**Source:** Japan Casting Industry Association (as of end-December 1958).

The prices of products are usually about three times as high as those of raw materials. But nowadays the per ton prices of products average about ¥72,000 as compared to ¥31,000 for per ton raw material. Management is by no means easy, and those foundries which cannot afford to replenish necessary raw materials are appearing. Orders, however, are considerable. Aware of persistent strong investments in industrial facilities, the casting industry is rather optimistic about its future prospects.

Exports are not finished products, are the so-called indirect exports, and are hard to grasp. The industry is forming cooperative associations throughout the country which jointly purchase raw materials, facilitate finance, or discount bills. It also shows keen interest in the minimum wage system, and Kawaguchi City has already adopted it since April 1959.

### *3) Techniques in Casting Industry*

The Japanese metal casting industry had undergone an industrial revolution during the Russo-Japanese War and World War I, and had established its foundations as an industry which manufactured parts for machinery industries. During this period, it had gone through a technical innovation in the following manner:

(a) Transfer from charcoal to coke for fuel

(b) Transfer from the traditional firing mold to loam mold

(c) Transfer from iron sand pig iron to blast furnace pig iron for raw material

(d) Transfer from manpower to steam power and further to electric power for blowing

Through such technical innovation, the Japanese industry developed technically. Since the production process of the industry is relatively simple, however, hordes of petty foundries came into existence, their technical standards were low, and there were left many unmodern aspects of entrepreneural management.

After the end of World War II, specifically after the Korean War, the scale of the Japanese economy had shown remarkable expansion, during which time the casting industry showed keen interest in industrial modernization. Technical standards have since then been raised conspicuously, and progress in modernization was especially remarkable in small and medium foundries. The industry is now on the threshold of another major technical reformation. The recent modernization of industrial facilities will be explained in the following:

The metal casting process could be divided into melting, sand treatment, moulding, casting, finishing and inspection.

(1) *Melting*—The cupola furnace of old type is gradually going out of use, except in petty foundries, being replaced by the cupola furnace. The blowing equipment used to be of the cold-wind type, but recently it has been remodeled into either the semi-hot or hot blast type to ensure melting at high temperatures, and thereby improve quality. Some of the large-scale enterprises in the machinery industry which do metal casting business as a side business have installed electric furnaces instead of cupola furnaces.

(2) *Sand treatment*—Few founders had paid attention to improvement of sand treatment, and most depended on the intuition of skilled hands. Now that it is required to make the surface of cast metals as smooth and beautiful as possible, scientific treatment of sand in quality control and blending has come to assume great importance. In recent years, sand treatment has come to be done by the use of machines.

Machines for such sand treatment include sand dryers, sand mills, sand mixers, sand blenders, and sand screens. Of course, only large foundries could install a set of these machines and equipment. The greater part of the foundries are introducing one or two types of machines, but qualitative improvements on sand treatment and products are noteworthy.

(3) *Moulding*—The moulding is the principal process of works at foundries, and moulders are the main force of labor. In fact, the labor productivity of a foundry is represented by the production amount per moulder. But their heavy manual labor and unwholesome working con-

ditions (including high temperatures) make job-seekers shy of becoming moulders.

Recently molding machines are being introduced to lessen the heavy labor of moulders and improve the qualities of cast-metal products. The adoption of these moulding machines is especially active in medium and large foundries. These foundries, however, have not adopted the conveyor system for the transportation of sand and hot water as yet. The conveyor system, when connected directly to the moulding process, is expected to enhance productivity by five times.

(4) *Finishing*—The finishing process includes the brushing off of sand, removing of fin, welding, acid washing, grinding and annealing. As the surfaces of cast-metal products are strongly required to be smooth and beautiful, greater importance has come to be attached to the removing of sand and fin. Until some time ago, tumblers, grinders and compressors were the main tools for cleaning, but nowadays shot-blasts or sand-blasts have come into use, improving the qualities of cast-metal products markedly.

(5) *Conveyance*—Not only the metal-casting industry but also other smaller industries have ignored improvement of conveyance facilities. In most foundries, handcarts, hand cranes and chain-blocks were the means of conveyance, but recently motor cranes, hoists and monorails have come to be installed in medium and large scale foundries.

*4) Future Direction*

Such industrial modernization has brought about remarkable improvements on the qualities of cast-metal products and labor productivity. Working conditions and labor organization are also making progress in modernization. It is to be admitted, however, that the progress of industrial modernization is widening the disparity among enterprises. The gap between small enterprises on the one hand and medium and large enterprises on the other has been deepened. This phenomenon is of course not exclusive to the metal-casting industry. However, such a dual structure, which characterizes the Japanese economy, will remain a puzzling question that the metal-casting industry will have to tackle and solve.

# III.

## Chemical Industries

### (I) Glass Products Industry

*1) Development of glass products industry*

It is said that the manufacture of glass products in Japan was started even before the age of Emperor Nintoku (311-399). It was with the setting up of the Shinagawa Glass Works which was first founded in 1873 and purchased by the Government three years later that it established its basis as a modern industry. The Shinagawa Glass Works was dissolved in 1892. Part of its employees, however, opened their own plants, and these plants later increased gradually. During the first world war, the glass products manufacturing industry made rapid strides, and in 1919 the number of plants throughout the country reached 1,200 with a total of 20,000 workers, turning out ¥42 million worth of products.

Like many other industries, the glass products industry suffered from a depression in the early period of Showa (1926 —). With the re-banning of gold export, however, it began to be developed again. It was during this period of depression that the automatic bottle manufacturing machines became popular, adopted by Japan Glass Industry Co. and Tokunaga Glass Industry Co. The industry reached its peak in 1937 when 455,000 tons of products were turned out at 1,100 plants with an aggregate of 35,500 workers.

This boom, however, did not last long. With the outbreak of the Sino-Japanese Incident and the Pacific War, the industry ran into difficulties. The glass industry, regarded as a peace-time industry, was largely curtailed in the enterprise adjustment carried out by the Government in 1941 and again in 1943. As a result, it was reduced to one-six (170-odd) in the number of plants and one-third (15,000 tons) in the monthly production capacity compared with the peak year of 1937. With many plants destroyed by air-raids, the number of plants fell to 115 immediately after the end of the war. Subsequently, however, the industry was reconstructed steadily, with the number of plants now increasing to about 400. Compared with the peak year of 1937, however, the present number of plants is still only one-third.

*2) Structure of production*

Major glass products include glass bottles, vessels for table and kitchen use, articles for physical, chemical and medical use, and apparatuses for illumination. These articles combine to reach ¥27,400 million annually, accounting for 48 per cent of the total glass production. Glass production is concentrated in big consumption areas centering on Osaka-

Kobe, Tokyo-Yokohama, Nagoya and Fukuoka. This is because glass products are easily damaged.

Japan's glass products manufacturing industry is composed of more than 400 medium and small enterprises. Of the total, 10 are comparatively large makers each having more than 300 employees, engaged in the manufacture of various types of bottles for sake, beer, milk and soy sauce by the use of automatic bottle manufacturing machines. The other manufacturers are mostly small-scale enterprisers each having not more than 50 employees. These smaller makers manufacture bottles for drugs and cosmetics, ampuls, and decoration glass, adopting the semi-automatic production system or artificial blowing system.

Thus, the field of production is divided rather distinctly according to the business scale and production method. This is because bottles for drinks and seasonings are uniform in shape and color and enjoy great demands and therefore are suitable for mass production, while other bottles, that is, those for drugs and cosmetics, largely vary in shape and color with comparatively small demand and therefore are suitable for production at the smaller plants. Recently, however, the production field of the smaller enterprises has been narrowed due to the vigorous advance of big makers.

Raw materials for glass products include soda-ash, silica sand and lime. They are melted and shaped (mechanized processes at big enterprises, but hand work at most of the smaller enterprises). They are subjected to printing if needed. The finished products are sold to commission merchants or directly to consumers.

In the following paragraphs, explanations will be given about the production structure of major items of glass products, including (1) automatically-manufactured bottles, (2) bottles for cosmetics and drugs, (3) glass products for dinner-table and kitchen use, and (4) ampuls.

(1) Automatically-manufactured bottles

There are now 10 companies engaged in the automatic manufacture of bottles. Of the total, three are under the exclusive control of the nation's three major beer companies, and produce mainly beer bottles and fruit juice bottles. They also receive orders from other companies for various other types of bottles and manufacture eye-glass lenses. The other seven companies turn out bottles for sake, milk, fruit juice, soy sauce and beer.

After the war, a system under which empty bottles are recovered in a link with the sales of bottled foodstuffs came to be popularly adopted. Due to this system, re-use of emptied bottles is smooth, making the demands for new bottles only those for the replacement of broken or damaged old bottles. This fact is greatly hampering the recovery of bottles production. During the last three years, bottles production halved despite the increased beer production. This is due to the fact that the demand for new bottles was only 11 per cent of the bottles in use annually. The same is true with sake and soy sauce bottles. For bottles

for Western liquors, however, the replacement rate is 60 per cent or so, and the production of new bottles is increasing. This is because bottles for Western liquors differ greatly in shape and color according to manufacturers and are not interchangeable with one another.

Demands for bottles fluctuate from season to season, affecting production. Production is highest in February-May for bottles for soft drinks, April-August for beer bottles, August-October for milk bottles, and October-December for sake bottles.

The problem for the glass bottle manufacturers is that they cannot readily curtail production even when demand declines. That is, once the kiln is burned, the fire must not be extinguished for about a year until the time when new kilns are built next year. This means production must continue irrespective of orders for the products. Therefore, decreased orders inevitably result in increased stockpiles.

The manufacturers' inventories have decreased somewhat since 1959. They, however, are still equal to their two months' output, making their funds operation rather difficult.

Exports, which occupied 33.5 per cent of the total output of 445,000 tons in 1937, accounted for only 4.7 per cent of production in 1957. Reasons for the export shrinkage are Japan's loss of the Chinese market, the increased rate of self-supply among Southeast Asian countries and vigorous advance of West German products as well as the low international competitive power of Japanese products due to the relatively high costs of raw materials.

Main raw materials for glass products include silica sand, borax, soda ash, petroleum and heavy oil. Japan depends on foreign countries for the supply of nearly all these materials, excepting silica sand which is domestically produced.

The cost of automatically-manufactured bottles is broken down into the raw materials cost, 37 per cent of the total, fuel cost, 23 per cent, processing cost, 20 per cent, and other expenses, 20 per cent. That is, the cost of fuel accounts for a considerably large part. In an attempt to cut the fuel cost, nearly all plants have already switched from coal to heavy oil. The switch to heavy oil, it is expected, will cut the cost by some seven per cent.

(2) Bottles for cosmetics and drugs

The annual production of these bottles now approximates 80,000 tons, valued at about ¥4,500 million, accounting for 15 per cent of all the glass products in both quantity and value.

Like other glass products, major production centers are the Tokyo-Yokohama and Osaka-Kobe areas, which combine to account for eight per cent of the total output. Widely different in shape and color and rather small in demand, bottles for cosmetics and drugs are manufactured by relatively small makers by a semi-automatic manufacturing method or artificial blowing method.

Their production was only 80,000 tons in 1959, as against the prewar record of 905,000 tons. The slow postwar recovery of production is attributable to the sluggish export as well as the fact that cosmetics production is still below its prewar level. Exports of drug bottles account for only one per cent of their production, whereas they reached 50 per cent before the war.

Bottles for cosmetics and drugs are both manufactured on the basis of the orders received. While demands for cosmetics bottles are rather small, those for drugs bottles, many of them being the same in shape and color, are big. It often happens that orders are too big for a single maker to supply. A drug company usually places its order with one bottle maker, which in turn seeks cooperation from other bottle makers as its sub-contractors. Recently, large manufacturers, equipped with automatic bottle manufacturing machines, have also started the manufacture of drug bottles, putting big pressure on medium and small makers. With the advance of big makers on the one hand, and with increased stockpiles on the other, medium and small manufacturers are being put in a predicament.

(3) Glass products for table and kitchen use

These products account for 18 and 10 per cent, respectively, of the total glass products in weight and monetary value, with their monetary value being ¥2,700 million or thereabouts. They are broken down into cups and glasses, 52 per cent, dishes and bowls, 17 per cent, ash-trays and vases, five per cent, and others, 20 per cent. The production centers are Tokyo and Osaka areas, the former producing high quality goods and the latter low quality goods. In the past, the low-priced Osaka products advanced into the Tokyo market. Recently, however, the trend has been increasing for products in Tokyo, which are generally lower in price than Osaka products, to make inroads into the Osaka market.

Of late, big manufacturers have also started the production of cups and glasses which had been manufactured by medium and small makers by the semi-automatic or artificial blowing method. With the aid of modern machines, they are now mass-producing cups and glasses weighing six to eight ounces each. To meet this advance of big enterprises, part of the medium and small manufacturers are endeavoring to elevate the quality of their products by employing special designers or strengthen their sales network through closer tieups with commission merchants.

The encroachment of the market by plastics products was once feared. With the re-recognition of the merits of glass, however, this fear has been dispelled. However, the price of fuel—heavy oil—has been rising five to 10 per cent annually since 1959, and besides, the period between sight and payment of the bills they receive from commission merchants is tending to be prolonged. This, coupled with the advance of big manufacturers, is darkening the future prospect of the medium and small enterprises engaged in the manufacture of glass products for table and kitchen use.

Exports, which occupied 63 per cent of the total output before the war, have decreased to 20 per cent or so since the end of the war.

(4) Ampuls

About 41 per cent of the nation's total ampul production is turned out in the Osaka area, and 31 per cent in the Tokyo area. This geographic concentration of the ampul production is due to the concentration of drug manufacturers who are the major customers. The ampul makers numbered 102 throughout the country as of the end of December 1958. In addition, drug companies also have their own ampul production divisions, whose number, however, is unknown.

In the past, no capital was required for the production of ampuls. It was possible with only gass supply facilities, gas burners and some other simple equipment, with raw materials distributed by commission merchants. Therefore, a large number of sub-contractors mushroomed, causing keen competition for processing charges. With the subsequent management rationalization among many sections of industry, however, pharmaceutical companies have come to use automatic drug filling machines and demand ampuls of uniform quality. To meet the situation, part of ampul makers endeavored to manufacture ampuls of uniform quality by importing automatic ampul manufacturing machines. As a result, medium and small makers having no modern equipment have been weeded out, reducing the number of ampul makers, which once surpassed 1,000, to only 102 in 1958.

By capacity, ampuls are classified into 1 cc, 2 cc, 5 cc, 10 cc, 20 cc, 250 cc, and 500 cc ampuls. Of the total, 1 cc to 5 cc ampuls account for 70 per cent. In 1957, ampul production reached 47,700,000 tons, valued at ¥642 million, accounting for only 2.3 per cent of the total glass products output in monetary value.

Seventy-five per cent of the total ampul production is purchased by the 10 major pharmaceutical companies. Production is all carried out on the basis of the orders received. Demands from pharmaceutical companies, however, are not constant. It often happens that they place big orders at a time. Ampul manufacturers, therefore, have to keep considerable amounts of stocks. Since, however, each of the 10 major pharmaceutical companies has its own specifications for the ampuls it uses, ampuls used by one company are hardly interchangeable with those used by another. This fact is causing the ampul makers' stocks to increase further.

*3) Conclusion*

Major customers being large pharmaceutical companies, beer manufacturers and sake makers, the glass products manufacturing industry, mainly composed of medium and small enterprises, is apt to be put in an unfavorable position. Inasmuch as this problem is inherent in the industry, its solution is believed not so easy.

## (II) Oils and Fats Industry

### *1) Outline of oils and fats products*

The oils and fats industry is divided into (1) the oils and fats manufacturing industry using soybeans, peanuts and rape-seed as raw materials and (2) the oils and fats products manufacturing industry producing hardened oil, fatty acid, glycerine, soap, paints, etc. with fats and oils as raw materials.

Fats and oils are also classified into edible oils and fats and those for industrial use.

Edible oils and fats are divided into vegetable oils and fats including soybean oil, rape-seed oil, cotton-seed oil, peanut oil, sesame-seed oil and coconut oil, and animal oils and fats including whale oil, beef tallow, sardine oil and man-made butter. There are the following three methods of manufacture of edible oils and fats: (1) the compression method in which raw materials are pressed, (2) the extraction method in which oils and fats are extracted from the raw materials by the use of such solvents as benzene and alcohol, and (3) the manufacture of artificial butter for which various raw material oils and fats are dissolved and mixed. The extraction method requires a larger amount of capital than the compression method. It also needs complicate machinery equipment. Because of its higher rate of oil extraction, however, an increasing number of plants, especially large-scale plants handling a large quantity of soybeans, are now employing this method (the successive extraction method).

Oils and fats for industrial use are also divided into vegetable and animal oils and fats. Because of their relatively little smell, vegetable oils and fats are dissolved into fatty acid and glycerine, the latter being used as material for soap, grease and candles. Animal oils and fats include, among others, whale oil, fish oil and beef tallow. To remove their rather strong smell, whale oil and fish oil are made into hardened oil by adding hydrogen and then used as material for soap or for other industrial purposes. At present, however, they are mostly dissolved into fatty oil for industrial use.

How are the development and present conditions of the oils and fats industry? In this chapter, the industry is divided into the oils and fats manufacturing industry and the oils and fats products manufacturing industry, and explanations will be given about the vegetable oils and fats manufacturing industry as representative of the former, and the soap manufacturing industry which has the longest history among the latter group.

### *2) Oils and fats manufacturing industry*

1. History

The history of oil extraction in Japan dates as far back as 1,500 years ago. In olden times, vegetable oils included sesame-seed oil, walnut oil

and hemp oil, which were first used for lighting. Subsequently, they came to be used also as foodstuffs, and drugs as well as for painting and polishing. In the Tokugawa period, increased production was encouraged for rape seed and cotton seed, and the sales and purchases of oils were put under the control of the Tokugawa Shogunate. The oil manufacturing business at that time was not yet a modern industry, carried out as the so-called household industry under the control of commission merchants. The manufacturers were granted various privileges by the Shogunate in return for the money they paid to it. Oil commission merchants in Edo (present Tokyo) and Osaka formed a special organization which was given the power of monopoly by the Shogunate.

It was in the Meiji Era (1868-1911) that the oils and fats manufacturing business established itself as a modern industry. In the 20th year of Meiji (1887), corporations using oil manufacturing machines were established one after another. In 1889, machines for oil extraction were first licensed, and oil manufacture by the extraction method was started on a commercial basis. In 1902, soybean oil manufacture by the compression method was started, and in 1910, the extraction method by the use of benzene was adopted on a commercial basis. In 1907, the Nisshin Soybean Cake Manufacturing Works and Suzuki Drugs Manufacturing Works, which are the precursors of the present Nisshin Oils Manufacturing Co. and Ajinomoto Co., respectively, were established. In the Taisho Era (1912-1925), The Honen Oil Manufacturing Co. and the Nikka Oils and Fats Co. were set up.

From the early part of Showa to the outbreak of the Sino-Japanese Incident, the industry emerged from the depression into the period of recovery. Throughout this period, the manufacturers staged cut-throat sales competition on the domestic market and the centralization of enterprises progressed. The sales competition continued until around the outbreak of World War II when oils and fats were placed under strict Government control. Until around 1938, edible oils had been actively exported, centering on rape-seed oil and soybean oil. Due to the strengthening of export control in September 1939, however, their exports dropped sharply, and were all but suspended after the outbreak of World War II.

During World War II, the Government control over edible oils was strengthened further. The collection and distribution of rape-seed and soybeans had already been put under the Government control in 1940. In 1942, the oils and fats manufacturing industry was completely placed under the Government control with the establishment of a special organ for a sweeping control over the distribution of oils and fats named the Teikoku Oils Control Co. Meanwhile, the streamlining of enterprises progressed fast in accordance with the Enterprise Adjustment Law promulgated the same year, resulting in the closure of many plants.

With the termination of the war, the Teikoku Oils Control Co. was dissolved, and in 1948 the Oils Distribution Public Corporation was set up in its place. With the steady progress of the reconstruction of war-damaged plants and the establishment of new plants and the resultant marked increase in the production of oils and fats as well as their raw

materials, however, the Government totally removed, in 1950, the control over the distribution and prices of all oils and fats and their raw materials, except soybeans. In the following year, the Oils Distribution Public Corporation was dissolved.

2. Present Conditions

Geographically, oils manufacturing plants are located mostly in the areas producing raw materials, in the vicinity of port cities through which they are imported, and in the areas with consumption centers in the background. For example, plants manufacturing soybean oil, cotton-seed oil and coconut oil depending on imported raw materials are located mostly in Osaka, Hyogo, Shizuoka, Aichi, Mie, Fukuoka and Kanagawa prefectures as well as in the neighborhood of Tokyo. Rape-seed oil plants are concentrated in the raw materials producing areas, including Mie, Aichi, Gifu, Osaka, Hyogo, Shiga, Fukuoka and Saga prefectures.

In 1957, vegetable oils and fats manufacturing plants numbered 1,175, of which only five were large companies having more than 300 employees each, the remaining 99 per cent being medium and small enterprises. (See Table 1.) Compared with 1951 when there were 3,473 plants, the number of plants in 1957 was less than half. Raw material processing and oils and fats production in the same year, however, was about twice as large as in 1951. This is believed due to the closure or merger of the small manufacturing plants which had mushroomed with the sharp increase in the demand for oils and fats following the war's end. The number of employees also halved, while raw materials processing and oils and fats production per capita of workers registered an about four-fold increase, and the plant operation rate about double. This indicates the gradual progress of the modernization of plant equipment among medium and small enterprises to cope with the advance of large enterprises.

**Table 1: Vegetable Oils Manufacturing Industry**

| Enterprise scale (No. of employees) | No. of enterprises | No. of employees | Shipments (in ¥1 million) |
|---|---|---|---|
| — 3 | 836 | 1,915 | 1,800 |
| 4— 9 | 191 | 1,113 | 2,628 |
| 10— 19 | 66 | 860 | 3,221 |
| 20— 29 | 23 | 558 | 2,297 |
| 30— 49 | 22 | 825 | 4,736 |
| 50— 99 | 18 | 3,460 | 34,269 |
| 100—199 | 12 | *x* | *x* |
| 200—299 | 2 | *x* | *x* |
| 300—499 | 4 | 2,515 | 26,819 |
| 500—999 | 1 | *x* | *x* |
| TOTAL | 1,175 | 11,246 | 75,772 |

**Source:** "Industrial Statistics" compiled by the Ministry of International Trade and Industry (Fiscal 1957).

In the oils and fats manufacturing industry, there are great differences between large plants and medium and small plants. Usually,

the former is called "sea plants," while the latter is referred to as "mountain plants." These names are based on their geographic location. The "sea plants" are located in the vicinity of sea ports importing raw materials and are equipped with modern machines for continuous oil extraction, using soybeans as the major raw material. They are in a position to sell the exoleated soybeans as feed as well as for the manufacture of miso (bean-mash), soy sauce and tofu (bean-curd). On the other hand, the "mountain plants" are mostly equipped with compression machines, using rape-seed as the main raw material. There are not a few cases in which "mountain plants" are operated by farmers with their household labor, and their products, rape-seed oil, are exchanged for the raw material, rape-seed, in a barter trade between them and farmers.

With regard to raw materials, they are mostly imported from foreign countries, with the exception of rape-seed. In particular, almost all the needed soybeans are imported, with 90 per cent coming from the United States. Before the war, soybeans were actively produced domestically, compared with other raw materials for oils and fats. With these domestic soybeans used for the manufacture of bean-mash and soy sauce, however, Japan depended on China for the edible oils it needed. After the war, however, the import of raw materials for oils and fats, including soybeans, came to be made with American aid funds. Since 1950, they have been imported with commercial funds on a private basis, with the United States supplying the bulk of the imports. The import of foreign soybeans is regulated by the foreign exchange allocation system, and the imported soybeans are distributed among enterprises in accordance with the actual results in the past. Therefore, the majority of them are allocated to a small number of large enterprises. If the import of soybeans is liberalized in the near future, this inequality in their distribution may be eliminated to some extent. The liberalization of soybeans import, however, is considered very difficult inasmuch as there is a great difference between the prices of domestic and foreign soybeans. If the import of soybeans is unconditionally liberalized, domestic soybean manufacturers will be hit hard. In view of the situation, the Government is still balking at the liberalization.

The majority of the needed rape-seed are domestically supplied. They are collected by the National Federation of Agricultural Sales Cooperative Unions through the cooperative unions and sold to the larger and smaller enterprises. Therefore, medium and small enterprises, especially the latter, find it very difficult to obtain the needed rape-seed. They buy unexamined rape-seed directly from producers or are engaged in rape-seed oil manufacture as subcontractors. Due to the lack of the adequate sales network, in addition to the difficulty in obtaining the raw material, small enterprises in local areas are in a plight, and are compelled to go out of business or be amalgamated by large or medium enterprises.

Due to vigorous PR campaigns for the improvement of the dietary life, bread and dishes using edible oils and fats are becoming increasingly popular even among people in the rural district, boosting the demand

for edible oils and fats. Considering the current plant capacity, a further increase of vegetable oils production will be possible, and high expectations are entertained for the expansion of the domestic market and promotion of exports.

With the removal of controls on oils and fats in 1950, medium and small manufacturers, in their effort to compete with large enterprises, organized the Japan Federation of Oils and Fats Industry Cooperative Unions, which is engaged in offering guidance to member enterprises in the joint purchases of raw materials and joint sales of finished products.

### (III) Oils and Fats Products Manufacturing Industry

*1) History*

The oils and fats products manufacturing industry was started with the manufacture of soap. It is said to have been in the period of Oda and Toyotomi (the 16th century) that soap was first introduced into Japan. It seems that at that time it was used mainly in medical treatmen. Toward the close of the Tokugawa period, physicians were engaged in the domestic manufacture of soap. After Japan opened its ports for foreign trade in the Ansei Era (1854-1860), the manufacturing method of soap was introduced into Japan. On this technical basis, the soap manufacturing industry began to establish itsef at the outset of the Meiji Era (1868-1912).

The first soap manufacturing plant in Japan was set up by Mr. Wagner who came to Japan in 1854. From around 1857, new plants were established in Tokyo and Yokohama, and later in Osaka and Kobe, with the introduction of European manufacturing techniques. The domestic production of soap increased, almost equalling imports around 1877. In 1879, domestic output reached ¥100,000 in monetary value, surpassing imports which stood at ¥60,000. Six years later, Japan's soap exports topped its imports. Around 1887, the soap manufacturing industry was developed into a modern industry making use of machines. Around 1882, mechanical processing of coconut oil using steam power was full-fledgedly started, and many plants mushroomed.

The first world war provided conditions for the fast development of the soap manufacturing industry as a modern industry. Although soap imports were suspended due to the war, the hardened oil industry has already been introduced into Japan in 1913 and the glycerine industry also established itself in Japan around 1916-17. Therefore, Japan's soap industry absorbed the glycerine industry and stepped up its production, using hardened oil as the raw material, until 1940. During the period, however, large manufacturers of hardened oil advanced into the field of soap manufacture, oppressing medium and small soap makers, who managed to continue business as sub-contractors of hardened oil manufacturers or large soap manufacturers.

During World War II, the soap industry, regarded as a peace-time industry, was oppressed hard, with many medium and small makers

liquidated or amalgamated in the Government-pushed enterprise adjustment. After the war, hardened oil was replaced by beef tallow as the raw material for soap. The beef tallow was mostly imported from the United States instead of Australia. Following the end of the "Korean War boom," the price of beef tallow staged a reactional dip, dealing a heavy blow to those large soap manufacturers who had purchased this raw material abundantly. The plunge of the beef tallow price changed the relative positions of large manufacturers and medium and small makers, placing the latter in a favorable position. Subsequently, however, large manufacturers recaptured hegemony on the strength of technological innovation, including the adoption of continuous deodorization machines and hardened oil manufacturing machines, widening the gap between them and medium and small makers in manufacturing techniques as well as the quality of products.

*2) Present Conditions*

Inasmuch as the manufacture of soap does not require advanced techniques and large capital, an overwhelmingly large part of soap makers were medium and small enterprises. Recently, however, the advance of large manufacturers has been noticeable, with the resultant centralization of production. According to the "Industrial Statistics" for fiscal 1957, out of the total 348 soap manufacturing enterprises, those having not more than nine employees each numbered 197, accounting for 56 per cent of the total. Those having not more than 300 employees each reached 340, while large enterprises having more than 300 employees numbered only eight, accounting for 2.5 per cent of the total. (See Table 2.) On the other hand, a survey by the Japan Oils and Fats Industrial Association in 1958, 15 major manufacturers accounted for 53.6 per cent of the nation's total soap production. Item-wise, their products occupied 62 per cent in toilet-soap, 55 per cent in powdered soap and 51 per cent in laundry soap (solid). Considering that laundry soap occupies a big weight among the products of medium and small makers, the recent trend toward the gradual replacement of laundry soap (solid) by pow-

**Table 2: Soap Manufacturing Industry**

| Scale of enterprise (No. of employees) | No. of enterprises | No. of employees | Shipments (¥ 1 million) |
|---|---|---|---|
| — 3 | 102 | 230 | 214 |
| 4— 9 | 95 | 604 | 911 |
| 10— 19 | 65 | 893 | 1,684 |
| 20— 29 | 32 | 781 | 1,751 |
| 30— 49 | 18 | 684 | 1,975 |
| 50— 99 | 18 | 1,181 | 3,540 |
| 100—199 | 8 | 1,538 | 5,900 |
| 200—299 | 2 | *x* | *x* |
| 300—499 | 4 | 1,470 | 6,949 |
| 500—990 | 3 | 3,225 | 16,237 |
| 1,000— | 1 | *x* | *x* |
| TOTAL | 348 | 10,606 | 39,164 |

**Source:** Industrial Statistics, the Ministry of International Trade and Industry (Fiscal 1957).

dered soap seems to be expediting the centralization of soap production.

More than 90 per cent of soap manufacturing plants are located in Osaka, Nagoya and Tokyo which are consumption centers and good ports for the import of beef tallow for the supply of which the soap makers entirely depend on foreign countries.

The manufacture of soap is so simple that it is made by boiling beef tallow in a soap-boiling kettle. Therefore, it is regarded as difficult to estimate its exact production figure. According to the annual reports published by the Japan Oils and Fats Industrial Association, whch are considered most reliable, in 1958 production totaled 60,000 tons for toilet-soap, 192,000 tons for laundry soap, 6,000 tons for soap for textiles, 1,000 tons for soap for industrial use, 81,000 tons for powdered soap, and 2,000 tons for others, aggregating 345,000 tons.

Among the various items, powdered soap registered a sharp production increase after the war. Their production index rose to 141 in 1957 (the index for 1956: 100) and further to 182 in 1958. Responsible for this signal gain of powdered soap production is the popular use of electric washing machines not only among urban families but rural families as well. On the other hand, the production to toilet-soap has been marking time, indicative of the stabilized demand situation. With the diffusion of knowledge on sanitation as well as increase in population, the demand for toilet-soap is also expected to go up gradually, if not fast. The stagnation or the downtrend of the production of soap for textiles and industrial use is due to its replacement by chemical cleaning materials made from mineral oil and alcohol.

In 1939, soap exports reached 71,000 tons, or 27.2 per cent of the total production. After the war, however, soap exports declined sharply due to Japan's loss of big markets, including China and Korea, as well as the fact that the low-priced fish oil was replaced by the high-priced beef tallow as the raw material. In 1955, exports were 1,535 tons, or 0.6 per cent of the total output, while in 1958, they were 1,302 tons, or 0.4 per cent.

It is feared that the expected liberalization of import will hit hard the manufacture of toilet-soap through the influx of foreign products. For laundry soap and powdered soap, however, the liberalization is believed to have only little effect since these two items have ample international competitive power in both quality and production cost. Attracting greater concern among soap manufacturing circles is how to check the intensified drive for underselling resulting from unfair competition among the manufacturers. As a means to solve this problem, it is planned to establish a special union to control the import of raw materials and shipment of finished products. Since, however, large manufacturers account for the bulk of the total production of the industry, as mentioned already, fear is entertained as to what effects the new measure will have on medium and small makers. Competition between soap and other clean ing materials, which is seen only between those for textile and industrial use, is not yet considered a serious problem. In the future, however, it will pose a big problem.

# IV.

## Ceramics Industry

### (1) Development of Ceramics Industry

It was between the closing years of the middle ages to the early years of the modern times that the production of china and porcelain was started on a commercial basis, and under feudal lords' heavy protection during the Tokugawa Period, the ceramics industry made long strides. The production centers were Seto, Owari, Mino, Awata, Shimizu (Kyoto Prefecture), Arita (in northern Kyushu), etc.

Entering the Meiji Era, the production of china and porcelain made further development, because direct relations with overseas markets had been established. The Meiji government took positive export promotion measures, and Japan's participation in expositions abroad in 1873 and 1876 helped open up export opportunities for ceramic ware.

Exports of china and porcelain rose steeply from around 1877 and reached about ¥62,000 in 1882, or 1.5 per cent of the nation's total export value. The export value was the second highest, following only that of raw silk. After 1878, the production of ceramic ware stagnated. Despite a decline in domestic demands, 52 per cent of the total production was exported in 1882. This fact substantiates that the Japanese ceramics industry had developed on the strength of brisk exports. Although production centers of ceramic ware for domestic consumption remained in stagnation, Seto, Arita and Mino, which lost no time in emphasizing the production of china and porcelain for export, enjoyed prosperous business and later on formed the kernel of industrial modernization.

Exports of ceramic ware turned sluggish after 1882 but rose again from 1886, topping ¥1 million in 1886, ¥3 million in 1899, and ¥794 million in 1906. During this period, overseas demands for Japanese china and porcelain underwent a big shift from ceramic ware for decoration purposes to daily use. Until the 1890's, major export markets for Japanese ceramics were European countries (about 50 per cent) and North America (one-fourth), but in 1904 to 1908, North America came to account for 50 to 60 per cent of the total, and the share of European countries dropped to a mere two to three per cent.

Thus both the production and export of ceramic ware made remarkable development after the Russo-Japanese War, but from 1907 to the early part of the Taisho Era (1912 to 1926), exports dropped by nearly 20 per cent to the ¥5 million level, although production rose slightly. The outbreak of World War I, however, stopped the supply of ceramic ware into America and Southeast Asian markets from Britain, Germany

and France, offering opportunities for Japan to monopolize these markets. Exports finally reached ¥22 million in 1919.

The expansion of overseas markets inevitably stimulated expansion of industrial facilities and efficiency of the production process, and solidified the dominant position of plants for integrated work. In 1904, Nippon Toki Gomei Kaisha was established, and many large factories adopting mechanical power were set up one after another. But the production of ceramic ware was still in the hands of petty enterprises which were in the grip of wholesalers. Even such petty potters began to employ machines. Potter's wheels began to replace hand wheels, contributing tremendously to higher productivity. The debut of ceramic kilns using coal instead of firewood shortened the baking time by 50 per cent. Mechanization of the production process was accelerated when motor-driven machines came into use. Plants employing motor-driven machines accounted for a bare five per cent of the total number of ceramic plants in 1909, but their ratio rose to 16 per cent in 1914, to 33 per cent in 1920, and further to 51 per cent in 1925. By the use of patterns, standardization of products was pushed, and by the adoption of copperplates, rubber stamps and transcription, the processing methods improved considerably.

However, the Japanese ceramics industry which made notable development encouraged by a boom during World War I experienced a decline in exports as a result of the postwar panic as well as the rehabilitation of ceramics-manufacturing countries in Europe, and also an over-production. The industry which exported nearly 40 per cent of its production suffered a severe setback due to a decrease in exports. The fall in the foreign exchange market during 1938 and 1939 and an economic boom in the United States combined to enable the industry to expand its production and exports. From the closing years of the Taisho Era to around 1930, the tendency of market saturation and over-production became prominent. Exports recovered from a low ¥19,300,000 in 1931 and expanded to ¥53,370,000 in 1937. During the same period, production increased to ¥120,070,000 from ¥58,010,000.

Following the outbreak of the Sino-Japanese War in 1937, overseas market factors, sluggish domestic sales, difficulty in procuring raw materials and coal, shortage of labor and restrictions on the production of non-urgent goods dealt a staggering blow to the ceramics industry, and labor problems took place. A shift in production items and a favorable turn in export trade brought about a production peak around 1940. As wartime controls were tightened, however, enterprises were consolidated in January 1942, and by 1945, the number of enterprises was reduced to one-third of the 1940 figure. The number of employees also dropped to half.

After the war's defeat, exports and production of ceramic ware recovered as private trade was resumed, and slightly surpassed the prewar level in 1955, amounting to ¥20 billion and ¥26,500 million, respectively. The advancement of wireless telecommunications machines and equipment provided the ceramics industry with new markets in the telecom-

munications industry.

### (2) Production Structure of Ceramics Industry

According to the Ministry of International Trade and Industry's survey, factories in the ceramics industry numbered 3,962 as of the end of December 1958, and workers numbered 82,955. Enterprises employing less than four workers accounted for roughly 35 per cent of the total, while large enterprises with more than 300 hands number 40. In other words, ceramic factories with less than 300 workers took 98 per cent of the total. And 91 per cent of the total number of workers in this industry were in small and medium enterprises. Production-wise, the total output amounted to 532,861 tons in 1958, about 75 per cent of which is turned out by small and medium factories. In the ceramics industry, too, entrepreneural smallness is a salient characteristic.

**Ceramics Manufacturers**

| Scale | No. of workshops | No. of employees | Production volume (t) |
|---|---|---|---|
| 1— 4 workers ..... | 1,154 | 3,479 | 32,916 |
| 5— 9 ..... | 1,417 | 22,831 | 72,828 |
| 10— 29 ..... | 880 | 18,912 | 92,536 |
| 30— 99 ..... | 378 | 16,133 | 107,735 |
| 100—299 ..... | 93 | 13,652 | 90,872 |
| 300—899 ..... | 35 | 7,948 | 128,355 |
| Over 900 ..... | 5 | x | 7,620 |
| TOTAL..... | 3,962 | 82,955 | 532,862 |

**Source:** Ministry of International Trade and Industry.

**Note:** The numbers of workshops and employees are as of end-December 1958, and production volume is for January-December, 1958.

**Ceramics Production Records**

| Year | Volume (t) | Value (¥1,000) |
|---|---|---|
| 1955 ..... | 411,974 | 26,523,365 |
| 1956 ..... | 475,890 | 32,547,831 |
| 1957 ..... | 523,160 | 37,254,475 |
| 1958 ..... | 532,862 | 38,195,213 |

**Source:** Ministry of International Trade and Industry.

Potters are spread throughout the country, and converge on three prefectures in the Tokai district (Aichi, Gifu and Mie) with Nagoya as their center. Nagoya produces potter's clay of high quality in quantities, and these three prefectures account for roughly 80 per cent of the nation's total ceramics production.

Ceramic products include tableware, kitchenware, toys, tiles, sanitary wares, electrical appliances, ornaments, and products for physical and chemical purposes.

Large enterprises in the ceramics industry are adopting the mass-production process, but there is still much field where manual techniques are required. It is quite possible for both smaller and larger enterprises to go side by side. It is an indisputable fact that small and medium enterprises predominate in this particular industry, but at the same time the trend towards centralization and concentration of production in larger enterprises cannot be overlooked. Larger potters are advancing into the fields of dinner sets, high-pressure glasses, sanitary wares, tiles and mosaics, etc. But these tableware or articles of daily use which are mainly for domestic consumption are being manufactured by small and medium enterprises. Braziers or tableware for Japanese food which depend on provincial demands and traditional techniques are produced by a good number of petty potters. In the ceramics industry, there are large enterprises adopting the conveyor system and employing modern machines such as the tunnel kilen on the one hand, and partially mechanized factories on the other. Of course, they differ in production structure.

Ceramic products can be divided into biscuit wares and finished products. Most of biscuit wares are manufactured on orders, and supplied to wholesalers and processors. Many of the petty potters are engaged in manufacturing biscuit wares on orders from processors. Most of finished products are sold to exporters. Some of the processing manufacturers are doing export business, too. Generally, products are sold through the wholesale channels and shipped abroad through exporting firms.

Ceramics exports amounted to $72 million during fiscal 1958, or about 68 per cent of the total production. Item-wise, tableware topped the list with more than 50 per cent, followed by toys, ornaments, tiles and insulators. North America was the biggest client, accounting for nearly 60 per cent of the total exports. Southeast Asian countries were also good markets for Japanese ceramic wares.

### (3) Techniques of Ceramics Industry

There are a wide variety of ceramic wares. So the manufacturing processes. But the basic production process consists of earth preparation, formation, baking and processing. Some potters do this thorough process by themselves, but usually, there are specialists in the respective parts of the manufacturing process.

Now the manufacturing process of such general wares as bowls, dishes and toys will be explained below:

(1) *Earth preparation*—In this process, material earth and stones are smashed, impurities are removed, and they are kneaded. As material earth and stones, there are plastic clay, non-plastic materials such as kaolin, and quartz, silica, and cutback materials such as feldspar and borax.

(2) *Formation*—Material clay is formed, dried, and baked lightly. For reinforcement and beautification, it is glazed and prepared for glaze firing. The formation is one of the important manufacturing processes.

(3) *Baking*—This is the most important process, requiring high skills. Baking techniques are secrets, and the temperature inside the kilen and baking conditions are judged by the color of fire and the sixth sense.

(4) *Processing*—In this process, baked wares are processed and painted, if necessary, into finished products.

In factories specializing in earth preparation, mechanization of the process has been making notable progress, but in smaller enterprises doing integrated work, manual work still counts for much. In the formation process, automatic potter's wheels and automatic shaping machines have come into use in larger factories, but the manual work of skilled hands still plays an important role in other factories. In the baking process, heavy oil kilens and tunnel kilens have come to be used widely after the war's end, and the baking methods have become scientific. But potters still using coal kilens depend on the sixth sense. In the processing work, electrical kilens for painting are in use.

Generally speaking, the Japanese ceramics industry still depend much on the sixth sense and the manual work of skilled workers, but recently such modern machines and equipment as heavy oil kilens, tunnel kilens and automatic shaping machines have come into wider use. Such industrial modernization, however, costs much, and therefore it is limited to large factories at present.

### (4) Future Directions

One of the distinctive features of the Japanese ceramics industry is that it is an export industry. In fact, a goodly part of the production goes to overseas markets. Japanese potters are highly reputed in the world for their high skills and the qualities of their products. In the future, too, the development of the ceramics industry seems to depend on how it will be able to expand its exports. It is to be admitted, however, that production is becoming slightly excessive these days, and resultantly export prices tend downwards. The industry is now taking measures to stabilize export prices by adopting the check price system and clear inventories at the earliest possible time.

For ceramic wares, designs are more important selling points than qualities. That is why problems on imitations of designs among Japanese potters and piracy of foreign designs come up from time to time. In July 1956, the industry established the Japan Ceramics Design Center in an attempt to forestall such design piracy, a step which has been proving very conducive to expansion of ceramic exports.

# V.

## Lumber Industries

### (1) Plywood Industry

*1) History*

The plywood industry, charged with a mission of rationalizing the utilization of wood, an important natural resource, has a very promising future, along with the fiberboard and chip-board manufacturing industries.

It is not known when plywood was first manufactured in Japan. Sticking thin boards together, however, was started a rather long time ago. It was in 1907 that the modern manufacturing method of plywood was first adopted in Japan, or a little later than in Western countries. In 1911, veneer chests (mainly used as drug containers) were first imported into Japan. Subsequently, until around 1916 researches had been conducted on fundamental techniques on plywood manufacture such as cutting, planning and sticking, with several plants established in various places. It was with the outbreak of World War I that Japan's plywood industry began to take great strides. That is, World War I resulted in an increased demand for plywood for military use, and besides, with the prolongation of the war, exports of drug containers from Western countries to India and the South Sea areas decreased, causing Japan's plywood exports to these areas to increase. The suspension of the export of North European and North American products to London and Australia also opened these markets for Japanese plywood. Due to this favorable turn of the situation, new plants were established and old plants were expanded, steadily boosting production. Thus Japan's plywood industry was established as a modern industry. Due to the termination of the boom following the war's end and the depression which hit the nation in 1920-22, the industry turned lethargic. To meet the situation, the industry made efforts for cost reduction through business rationalization, and as a result, its conditions improved substantially.

The Great Earthquake which devastated the Kanto district in 1923 resulted in a sharp increase of demand for plywood as a reconstruction material, reactivating the plywood industry. It also resulted in widening the range of use of plywood which had been rather limited, offering the industry a good chance for its future development. The worldwide panic in the early part of the Showa Era hit hard Japan's industries. The plywood industry was no exception. It suffered a setback, although temporarily. In 1932, the industry established a firm basis in the supply of the raw material with the import of lauan, which does not warp, is easier to process and higher in the yield rate than Japan's domestic

lumber. Furthermore, soybean glue was manufactured at a low cost as a new adhesive replacing glue casein, and its manufacturing techniques improved, enabling the plywood industry to stage a signal development in both the quantity and quality of its products. In 1931, there were only 15 plants throughout the country, turning out 97,500,000 square shaku (10 square shaku equal 0.918 square meters) of products on a yearly basis. In the following year, however, the number of plants increased to 25, and the products 148,500,000 square shaku. Subsequently, both the number of plants and the quantity of products went up steadily, and in 1940, plants numbered 200, with their products soaring to 831,-143,000 square shaku, the highest in pre-World War I days.

Plywood exports registered a prewar peak of 215 million square shaku in 1939, accounting for about 33 per cent of the nation's lumber imports for the year in the monetary value. With the outbreak of World War II, however, the import of lauan was suspended, the export of plywood was also suspended, and many plywoods plants were weeded out in the enterprise adjustment carried out by the Government. As a result, the industry's annual production during 1942 and 1944 declined to one-third of the 1940 output, and in 1945 (when the war ended) to only one-tenth. On the other hand, however, there were military demands for high-class plywood for the manufacture of aircraft and others, and to meet the demands, the industry imported synthetic resin adhesives such as phenol resin adhesive and equipped their plants with hot presses, with the result that their products improved qualitatively. Around this time, comparatively large manufacturers set up plants specializing in the manufacture of wood boards in wood producing areas, and made plywood out of these wood boards at their plants in the vicinity of cities. With the end of the war, these special plants set up in wood producing areas also began to manufacture plywood, while independent plants were established in urban areas specializing in the manufacture of plywood out of the wood boards they purchased from other plants. Thus, the plywood manufacturing industry staged postwar recovery as fast as many other industries.

Until the resumption of foreign trade on a private basis in 1950, material wood had been supplied totally in the domestic market, with its supply largely restricted due to Government control. To meet the vigorous demands for the reconstruction of war-devastated areas as well as those from the Allied Occupation Forces, however, many plywood plants were reconstructed or newly established, mostly in Hokkaido where material wood was supplied abundantly. As a result, the number of plants reached an all-time high of 323 in 1948.

Although the plywood industry thus made signal postwar recovery, the industry at that time was rather different from what it is today. (1) The majority of its plant equipment were obsolete and inferior, carried over from the wartime, including hardly any modern machines such as hot presses and roll dryers which are now in use. (2) Due to an extreme shortage of synthetic resin adhesives, soybean glue and viscose glue were mainly used as adhesives, making it inevitable for the indus-

try to adopt the cold pressure method. (3) Although the industry enjoyed a brisk demand, mainly for the reconstruction of war-torn areas, its products were mostly of low quality, while its material wood was produced for the most part in Hokkaido and Tohoku and no lauan was used.

With the active import of lauan since 1951 following the resumption of private trade in 1950, plywood production increased remarkably. With the import of lauan, the majority of plants were moved from wood producing areas (Hokkaido and Tohoku) to port cities, and as a result, 50 per cent of all plants came to be concentrated in port cities including Tokyo, Shizuoka, Nagoya and Osaka, with their production accounting for 80 per cent of the total. These plants adopted the mass production system one after another, fast improving their equipment. In 1953, the total production hit a new high of 189 million square shaku, while exports also recovered to the prewar level, reaching 156,950,000 square shaku. Thus, Japan's plywood industry now can favorably compare with its counterparts in West Germany and Canada in production, although still behind those of the United States and the Soviet Union. In exports, it is competing for the world's top position with the Finish industry which ships out 90 per cent of its products.

*2) Present Conditions*

Unlike the steel and chemical industries, plywood manufacture did not need huge capital at first, and therefore, manufacturers were all medium and small enterprises. The subsequent modernization and rationalization of plant equipment, however, have caused the need of sizable capital, and private manufacturers reorganized themselves into corporations after the war with the expansion of their business. According to a government survey on medium and small enterprises, incorporated enterprises accounted for some 70 per cent of all plywood manufacturers in 1957.

The plywood manufacturers are classified into the following three groups:

(1) *Integrated makers*—Occupying the largest portion of the plywood manufacturers, they are the most rational form of enterprise. They are engaged in all processes of plywood production, including the manufacture of boards from material wood and the finished products from the boards. These enterprises are much larger in scale than the other two groups of manufacturers.

(2) *Board makers*—These makers are engaged in the manufacture of boards from material wood and sell their products to plywood makers or integrated makers. Boards are half-finished products and not directly connected with the consumption market, and therefore, these makers are not elastic in business operation.

(3) *Plywood makers*—These makers are engaged in the manufacture of plywood and plywood products, purchasing boards from board makers or integrated manufacturers.

Among the above three groups of manufacturers, integrated makers are the largest in number and scattered across the country, while board and plywood makers are small in number and concentrated in the Hokkaido and Shizuoka areas.

According to the "Census of Manufactures" conducted in 1957, plywood establishments numbered 287 throughout the country, with a total of 23,278 persons engaged, turning out ¥38,218 million worth of products. Establishments having less than 100 persons engaged each accounted for 77.6 per cent of the total number of establishments, while about 70 per cent of the total number of persons engaged and 76 per cent of the total production were accounted for by establishments having more than 100 persons engaged each. This is because establishments having more than 100 persons engaged each are mostly integrated manufacturers with well rationalized and modernized plants, while about 25 per cent of the establishments with less than 100 persons engaged each are board makers and small-scale plywood makers who buy needed boards from other makers. The enterprise scale in the plywood industry is showing a trend of expansion. This is indicated by the fact that while in 1953 large manufacturers having more than 300 persons engaged each numbered only three, they increased to 15 in 1957.

Major processes of plywood manufacture are as follows (there are some differences from plant to plant):

(1) Cutting the wood—Material wood is cut into pieces of required length with ha cross-cut saw or chain saw.

(2) Boiling—The wood pieces are boiled and softened in a boiling vat.

(3) Barking—They are barked, and sliced into boards, fixed on a rotary lathe or slicer.

(4) Cutting—They are cut with a clipper in the required size.

(5) Drying—The boards are dried either with a dryer or in a drying room until the ratio of their moisture content is reduced to five to 10 per cent.

(6) Grouping—The dried boards are graded and grouped into face, back and core boards. Stripped parts and core boards are bound together. The stripped parts are precisely cut with a jointer.

(7) Binding—For the binding of the sliced parts, a taping machine or veneer splicer is used. For former uses pasting tape, and the latter urea resin.

(8) Sticking—An adhesive is applied to the face and back of the core boards while they go through a glue spreader. A face board and a back board are combined with each of the core boards, and these combinations are immediately piled up for pressing.

(9) Pressing—The boards piled up after the adhesive was applied are pressed with a cold press of the water pressure or oil pressure type. When the pressure has reached a certain point, they

are taken out of the press. After being left as they are for several hours, they have the adhesive absorbed with a hot press. When soybean glue is used as the adhesive, however, the boards are just left as they are for six or 10 hours.

(10) Drying the plywood—It is hardly necessary to re-dry the plywood sticked with a hot press. In case only a cold press was used, however, the plywood needs to be dried again in a drying room. The moisture content of the finished products is 13 to 15 per cent, although there are some differences according to their standards.

(11) Cutting the edges—After the drying process, the plywood has their edges on the two parallel sides cut off at the same time by a double-sizer so that it will precisely become of the specified size.

(12) Finishing—After the edge-cutting, the plywood is finished with a scraper or a sander.

(13) Classification—The finished products are classified according to their quality.

(14) Examination—The classified products are checked by examiners for grading.

(15) Packing—The finished products which have passed the quality examination are packed and shipped out to the domestic and overseas markets. Part of them are stored in warehouses.

The "Overall and Basic Survey on Medium and Small Enterprises" conducted by the Ministry of International Trade and Industry in 1957 shows that machines for the stripping of boards (including rotary slicers) were owned by 186 (89 per cent) of the total 209 enterprises, while the remaining makers (11 per cent) were plywood makers who purchase boards from others and therefore did not need any equipment for stripping. The number of the machines for board stripping was 323, of which 139 (40 per cent) were relatively new, used for less than five years. The number of the machines per enterprise was one for the manufacturers having less than 50 employees each, two for those having 50-200 employees and three or four for those with more than 200 employees.

A total of 151 enterprises (72.2 per cent) had dryers. Of the 125 dryers reported, 86.4 per cent were comparatively new, installed less than five years ago.

Thus, the plywood manufacturers have been making efforts for the modernization of their plant equipment, and as a result, the majority of them have now come to possess dryers, hot presses or sanders.

In prewar days, the commission merchants system had been comparatively well developed, with the manufacturers depending on commission merchants for the sale of their products as well as the supply of operation funds they needed. After the war, however, the commission merchants system was dealt a severe blow, making it of inevitable neces-

sity for the manufacturers to engage in the sales of their products for themselves and ask for financial help from monetary institutions. This change of situation also necessitated the formation of joint organizations by the plywood makers, the majority of which are medium and small enterprises. According to the "Overall and Basic Survey on Medium and Small Enterprises," 65 per cent of all plywood enterprises now have membership in the Common Facility Cooperative (Jigyo Kyodo Kumiai). Nearly all the plywood enterprises located in major production centers, including Tokyo, Osaka and Aichi Prefecture, have already been organized into the Common Facility Cooperative. Besides the cooperative unions, there are other organizations named "industrial associations" or "associations" in many parts of the country, which are working for the development of the plywood industry. The cooperative unions and other organizations combined to form the Japan Plywood Industry Association.

The Common Facility Cooperative are engaged in various joint businesses, such as the joint borrowing of funds (35 per cent of all enterprises now utilize this system) and the joint purchase of material wood (material wood accounts for 65 per cent of the production cost of finished plywood). In view of the necessity to support the prices of their products both at home and abroad, however, the cooperative unions recently started joint sale of the products of member manufacturers (24 per cent of all plywood makers now utilize this system), price agreement (carried out by 35 per cent of all makers) and production adjustment (carried out by 54 per cent in the 1957 survey but by all enterprises now as will be explained later).

At present, the quality standard of plywood is set by the Japan Agriculture Standard (JAS). Although its application is not compulsory, JAS has been set for improved quality of products, rationalized production and simplified and fair transactions as well as rationalized use and consumption of products. At present, therefore, it is adopted by major plywood plants. The products made on the basis of JAS are called the JAS plywood and are classified into five groups according to their durability as well as the degree of water-proofness. According to the condition of the board face, they are also divided into two-face plywood, two-face stripped plywood, one-face plywood and one-face stripped plywood. According to the quality of the board face, they are also divided into four grades for both domestic use and export standards. Export products must undergo the voluntary quality check by the Japan Plywood Examination Association and the examination by the Export Goods Inspection Office of the Ministry of Agriculture and Forestry.

According to a survey conducted by the Customs Office of the Finance Ministry, plywood exports totaled 106 million square meters in 1959, valued at $76 million, up 23 and 38 per cent, respectively, over the previous year. The export increase is believed due to the activation of the construction and furniture manufacturing industries in many overseas countries as a result of the worldwide upswing of business.

Market-wise, exports to the United States, which account for some

70 per cent of the total each year, reached 64 million square meters, $54 million in value, up 11 and 30 per cent, respectively, over the year before. (Until June 1959, the restriction of Japanese plywood imports had been studied at the Tariff Commission of the United States, and therefore, Japan's exports had been comparatively small despite brisk inquiries from America's construction industry.) Japan's plywood exports to Great Britain also increased sharply, totaling 18 million square meters, valued at $7 million, up 56 and 75 per cent, respectively, over the previous year. This is due to vigorous demands for lauan plywood in that country for the manufacture of furniture. Visible increases were also seen in the exports to Singapore, Hong Kong, West Germany and the Netherlands.

Item-wise, lauan plywood accounted for 70 per cent of all the plywood exports, reaching $53 million in monetary value.

With a view to stabilizing the domestic market as well as export, the Japan Plywood Industry Cooperative has enforced voluntary control over shipments, production equipment and quality of products since 1956. With the control over the production equipment now applied to all plywood manufacturing plants, the actual production was curtailed to some 80 per cent of the total production capacity in 1959.

**Table 1: Plywood Manufacturers**

| Size of pers. engaged | No. of establishments | No. of pers. engaged | Production (in ¥1 million) |
|---|---|---|---|
| — 3 | 20 | 54 | 50 |
| 4— 9 | 38 | 263 | 231 |
| 10— 29 | 71 | 1,254 | 1,195 |
| 30— 99 | 91 | 5,449 | 7,760 |
| 100—299 | 52 | 8,811 | 15,263 |
| 300— | 15 | 7,397 | 13,719 |
| TOTAL | 287 | 23,278 | 38,218 |

**Source:** "Census of Manufactures", the Ministry of International Trade and Industry.

**Table 2: Exports of Plywood**

(Unit: 1,000 square meters, $1,000)

| Country \ Year | 1957 | | 1958 | | 1959 | |
|---|---|---|---|---|---|---|
| | Quantity | Value | Quantity | Value | Quantity | Value |
| Total | 82,015 | 55,045 | 86,131 | 55,521 | 106,348 | 76,432 |
| U.S. | 61,610 | 44,290 | 58,232 | 42,094 | 64,543 | 54,547 |
| Britain | 10,767 | 4,784 | 11,572 | 4,228 | 18,101 | 7,386 |
| Canada | 3,820 | 2,721 | 4,955 | 3,737 | 4,544 | 4,582 |
| Singapore | 161 | 108 | 445 | 338 | 4,235 | 2,158 |
| Hong Kong | 565 | 307 | 1,869 | 934 | 3,919 | 1,983 |

## (2) General saw and planning veneer

### Lumbering

The number of enterprises sawing up logs and manufacturing plywood and furniture is legion, and they enjoy an indisputable position in Japan's small industries. Sawing mills are ubiquitous throughout the country, but they are regarded as one of the typical industries where concentration and centralization of capital has made little progress.

*1) Historical background*

It was around 1872 that sawing machines were imported into Japan. By the middle of the Meiji Era (1867 to 1912), lumber mills came to be set up in Hokkaido and other lumber-producing districts. As compared with other industries, the lumbering industry was very primitive in terms of capital and organization. Entering the Showa Era (1927 to —), the rising demand for lumbers increased the number of sawing mills, and around 1935, a sharp increase in military demands for lumbers accelerated this trend, enabling the lumber shipments to register a prewar record high in 1939.

But after a law to control lumbering was instituted in 1941, the number of lumber mills decreased sharply to 8,600 units (224,000 hp) from 24,000 units (385,000 hp) at the time.

Intensification of World War II pared down the nation's lumbering capacity sharply. After the war's end, however, enormous rehabilitation demands for houses, ships, rolling stock and the like gave a big impetus to the construction of sawing mills in various parts of the country. By 1949, the number of sawing mills increased to 38,600 (741,600 hp).

**Changes in Number of Sawmills**

| Year | No. of mills | Total Horse Power | Remarks |
|---|---|---|---|
| 1927 | 9,485 | 170,287 hp | |
| 1941 | 24,525 | 385,501 | Before control |
| 1941 | 8,671 | 224,062 | After control |
| | | | (Lumbering production) |
| 1945 | 7,566 | 232,420 | 19,382,000 |
| 1949 | 38,607 | 741,094 | 30,477,000 koku |
| 1953 | 30,649 | 677,585 | 56,644,000 〃 |
| 1957 | 29,439 | 657,317 | 66,687,000 〃 |
| 1958 | 29,010 | 663,635 | 69,391,000 〃 |
| 1959 | 28,923 | 672,638 | 75,885,000 〃 |

**Source:** Forestry Agency, Ministry of Agriculture and Forestry.
**Note:** 1 $m^3$ = 3.5937 koku.

*2) Present Situation*

Japan's demand for lumber had been soaring year after year in parallel with the development of the national economy, and finally reached 48,990,000 cubic meters in 1959, or about two times the 1934-36 level. Seen from the standpoint of the uses, the lumber demands could be broken down to 35 per cent in building materials, 23 per cent in pulpwood, six per cent in plywood, fiberboard and chip-board, five per cent in pitprops, and 31 per cent in others (for packing, furniture, furnishings, electric poles, rolling stock and civil engineering).

These ratios were for 1959. One of the recent noticeable trends in demands is that although the greater part of the lumber demand was for building materials in prewar days, the weight of pulpwood, plywood, fiberboard and chip-board is increasing. The ratios of building materials, pit wood and others are inevitably declining. It must also be pointed out in connection with the lumbering industry that the use of broad-leaved trees (22.7 per cent of the total lumber demand) is rapidly increasing these days.

*3) Production Structure*

As the attached table indicates, the number of lumber mills in Japan reached a peak of about 40,000 units in 1949 in reflection of brisk war rehabilitation demands. As the economic stabilization was attained, however, the number of sawmills tended to decrease, totaling about 29,000 units in 1959. About 55.7 per cent of these mills were petty establishments of less than 15 KWH; 21.3 per cent, those of the 15 to 25 KWH category; and a bare two per cent, larger mills of more than 75 KWH. Nearly 54 per cent of these mills were under personal management, but the figure was virtually about 70 per cent because even incorporated enterprises, in many cases, had strong personal coloring. This phenomenon is by no means exceptional in Japanese manufacturing industries. In the meantime, about 70 per cent of the existing sawmills were established after World War II, namely after 1946. Hardly needing big investments in machinery and equipment and special technical

**Lumber Mills by Scale**

(As of end-December 1959)

| Classification by horse power | Total No. of sawing mills | | Private management | Incorporated | Association | Gov't, others |
|---|---|---|---|---|---|---|
| Total..... | 29,112 | 100 % | 15,960 | 12,011 | 695 | 446 |
| Under 7.5 KWH .. | 8,260 | 28.4 | 6,642 | 1,261 | 204 | 153 |
| 7.5— 15.0..... | 7,938 | 27.3 | 4,996 | 2,580 | 226 | 136 |
| 15.0— 25.0..... | 6,227 | 21.4 | 2,708 | 3,308 | 147 | 64 |
| 25.0— 37.5..... | 3,709 | 12.7 | 1,122 | 2,462 | 82 | 43 |
| 37.5— 75.0..... | 2,381 | 8.2 | 456 | 1,863 | 31 | 31 |
| 75.0—150.0..... | 493 | 1.7 | 32 | 444 | 4 | 16 |
| Over 150.0 KWH.. | 104 | 0.3 | 4 | 93 | 1 | 3 |

**Source:** Statistics and Survey Division, Ministry of Agriculture and Forestry.

knowhow, they mushroomed one after another, riding on the crest of the enormous rehabilitation demand for lumber. Another reason for small capitalization of the lumbering industry is because there is little possibility of large enterprises encroaching upon this near-primitive field of industry.

There are such motive power sources for lumbering as hydraulic power, steam power, electric power and volatile oils, but about 90 per cent of the lumbering mills in Japan are using electric power to operate their machines and equipment. The remaining 10 per cent employ petroleum motors and others. The predominance of electricity as motive power seems to be because of the simplicity, low operation costs and few troubles of facilities for motive power, and small space needed for them.

*4) Machines And Equipment*

The lumbering saws now in use in Japan could be classified broadly into band-saws and circular saws. Although band-saws came into use later than circular saws, they are gradually replacing the latter because of such merits as better lumbering capabilities and higher yield rates. Today they are becoming indispensable to rational and efficient lumbering. Until the advent of band-saws, circular saws used to enjoy a vital position among sawing tools, but gradually gave way to band-saws. Being economical, circular saws are being found suitable to small-sized mills. But technically, they should be utilized as auxiliaries to band-saws rather than as main saws.

There are two kinds of band-saws—band-saws with log-conveying equipment and table band-saws. Some are their combination. Band-saws with log-conveying equipment are usually for cutting logs into about four pieces, while table band-saws are used to saw these pieces into boards, squares, etc. The combined saws are convenient and are able to fulfil either of these two purposes as the case may be. It is admitted that they are roughly 30 per cent more efficient than table band-saws in sawing boards, etc. At present hand-operated band-saws with log-conveying equipment are not newly manufactured, but in many cases

**Number of Sawing Machines**

| Date of survey | Pit Saws | | | | | | Crosscut Saws | | |
|---|---|---|---|---|---|---|---|---|---|
| | Air drive type | Band-saw w. hand loader | Combined type | Table type | Circular saws | Pit saws | Band saws | Circular saws for lumbering | Circular saws for box making, etc. |
| Dec. 31, '56.... | 8,604 | 5,275 | 7,601 | 6,527 | 30,049 | 950 | 932 | 13,386 | 24,426 |
| " , '57.... | 9,190 | 5,928 | 8,219 | 7,497 | 28,483 | 603 | 760 | 12,929 | 26,231 |
| " , '58.... | 9,725 | 4,909 | 8,510 | 7,984 | 26,148 | 608 | 813 | 13,276 | 28,569 |
| " , '59.... | 10,914 | 5,109 | 8,976 | 8,101 | 37,036 | 883 | — | — | — |

**Source:** Statistics and Survey Division, Ministry of Agriculture and Forestry.

**Note:** The reason for the big number of circular saws for 1959 was the inclusion of crosscut saws as a result of the abolition of the survey item for crosscut saws.

the combined type of saws are being used. Recent products such as air-drive log stop and loaders are highly automated, and all their operation process is done by buttons and switches. Old models necessitated three to four hands but these modern products can be operated by one man. Despite these merits, they are not made to great use as yet because they are relatively expensive, and when they are used, lumbering on a mass-production scale is needed.

This table reveals that the number of highly efficient machines and equipment such as air-drive log stop and loaders tends to increase substantially, while circular saws, other than those for box making, are being supplanted with band-saw. In sawmills of more than 25 h.p. the ratio of band-saws against circular saws is 1.5 to 1, but in smaller mills, the ratio is still 1 to 8 heavily in favor of circular saws.

According to the Overall Survey on Smaller Enterprises conducted in 1957, those owning band-saws accounted for 67.2 per cent of the total, and the users of circular saws, 84.2 per cent.

*5) Form of Production*

Lumber mills could be classified by the methods of accepting orders into two types. One type of them purchase logs at their own estimates, process them, and ship them to the market. The other type of mills just saw the logs provided by their clients according to the clients specifications.

The Ministry of Agriculture and Forestry's 1959 survey showed that nearly 73 per cent of the sawmills (numbering 21,351 units) were doing piecework more or less, and only 26.7 per cent (7,751 mills) did not job work at all. And 13 per cent of the total (3,829 mills) were found specializing in piecework and when those mills depending mainly on piecework were added to them, their ratio was 23 per cent. All these figures seem to speak eloquently of the subordinate position of a great number of small sized sawmills. In fact, about 80 per cent of the small-scale mills are doing job work, and within cities, there are many specializing in piecework. It is witnessed that the larger mills are, the less they do piecework.

The sawmills which process materials on hand number 25,283 units. Of them, 56.2 per cent produce chiefly squares; 33.4 per cent, boards; and 10.4 per cent, lumber.

*6) Log Purchases*

The places of log purchase differ considerably depending on where sawmills are located. Lumber mills in cities, for instance, obtain domestic logs placed at auction by Regional Forestry Offices. The auction is held once a month, and the bidders should be registered with the prefectural governments. They also purchase logs from wholesalers in the places of production and cities and log markets. Mills at the foot of mountains, though many of them own their own forests, depend on nearby Regional Forestry Offices. As to foreign logs, they come into the

country through Tokyo, Nagoya and some other ports, but few mills have direct dealings with importers. Foreign logs are, in most cases, being supplied via wholesalers to sawing mills.

According to the Ministry of Agriculture and Forestry's survey on the purchase of raw materials, 42.3 per cent of the sawmills are buying logs; 27.9 per cent, standing trees; and 19.8 per cent, logs and standing trees at a 50-50 ratio. Smaller lumber mills purchase timbers and larger ones logs.

### Exports Of Lumber Products

Exports of lumber products totaled 430,000 cubic meters, valued at $27 million. Since prewar days Japanese broad-leaved trees have been winning high reputation on the world market. After the war's end, however, exports are on the decrease due to restrictions on the supply of logs, but products made of lauan which is being imported from the Philippines and other countries in quantities are being shipped to the United States actively. Exports of lauan plywood and other products to the United States, however, will not be able to show spectacular increase in the face of increasing competition from the Philippines.

### Future Problems

In placing their production and management on a stable basis, sawmills have many problems yet to solve. First of all, problems on logs. Logs account for a considerable portion of the production cost, that is, about 65 to 70 per cent in an average. How to secure logs without bringing about a rise in log prices is a big headache. Many of the lumber mills have have developed near the places of timber production, but recently mills have come to be established far from the log supply sources. This geographical remoteness makes the management of sawmills more and more difficult.

Secondly, demands for lumber products will definitely increase in the future, but the lumbering industry is in for a tougher competition with other building materials. Lumber is easy to process and possess many superior properties as a building material. However, it is easy to decay and warp according to changes in moisture. As far as pillars and columns are concerned, lumber products have the edge on other materials, but in the field of boards, they will face keener competition from plywood, fiberboard, chip-board, etc.

Thirdly, lumber mills will have to double their efforts to make the best use of logs which occupy a substantial chunk of the production cost, and turn out marketable products. The Japanese lumbering industry is already reputed for its technical standards which are regarded as the foremost in the world. By using 25 to 27 BWG band-saws, it is proud of its high yield rate. But there is still much room for improvement

and development by raising working efficiency and improving saw-setting techniques.

It may be also needed for sawmills to combine sawing and lumber-processing businesses in order to utilize raw materials collectively, but one of the simplest methods for industrial rationalization is "chipping" business. Scrap wood to come out in the process of lumbering could be chipped and supplied to pulp plants. This was attempted in prewar years, too, but at that time, pulp production techniques were not so much advanced as to make this business paying. Around 1956, the pulp industry became confident of utilizing chipped scrap wood on a paying basis, and since then lumber mills throughout the country have been eyeing this business.

# VI.
## Sundry Goods Industry

### (1) Plastic Molding and Processing Industry

The word "plastic" itself means formative, fashioning, creative or capable of being molded. But today its meaning has considerably changed. In short, plastics are interpreted as a resiniform substances to be synthesized from chemicals. In technical terms, they are highly polymerized compounds of high plasticity. Plastics are neither animal nor vegetable nor mineral but are called a fourth substance. Along with the advancement of science, the kinds of plastics are on the increase, and by now nearly 50 different kinds of plastics are industrialized.

Some of them are still costly, and their markets have not been cultivated well. Used chiefly for molding and processing are thermosetting resins (phenol resin, urea resin, polyester resin, and melamine resin) and thermoplastic resins (vinyl chloride resin, polystyrene, and polyethylene).

Phenol resin—Raw materials of phenol resin are carbolic acid or cresol and formalin. Hence it is called carbolic acid or phenol resin, but it is generally known as bakelite. Phenol resin has been used from the beginning, and every possibility of its use has been tapped. It accounts for nearly 20 per cent of the total production of plastic materials, and its superior insulating quality helps extend the use of phenol resin for electrical appliances, including telephones and household electrical equipment.

Urea resin—Raw materials are urea and formalin. At present the production of urea resin is the second highest, following that of vinyl chloride. It is now indispensable as a binding agent for lumber, and in fact, half of the production goes into binding agents. Urea resin is cheaper than other resin. About 33 per cent is used as molding material. It can be dyed freely, and is free from smell, superior in electrical and mechanical properties and strong against cracks. It is widely used, therefore, in machine parts, sundry goods, tableware, buttons, etc.

Melamine resin—Raw materials are melamine and formalin. While urea resin is inferior in water-resisting qualities and fragile, melamine resin eliminates all these shortcomings. Melamine resin looks like urea resin, but its prices are a little high. Therefore, melamine resin is used for paints and the processing of textiles rather than as molding material. Future prospects of melamine resin as molding material.

Polyester—Raw materials are ethylene glycol, maleic acid and styrene. It is already nearly seven years since the manufacture of polyester resin was industrialized. Harder than iron and lighter than duralumin, it is watched as a revolutionary resin. Molding at low pressures and

normal temperature is easily possible. As building materials and also structural materials for rolling stock, ships, etc., it holds out bright future prospects. It is already being used actively as building materials such as corrugated boards and flat boards and also for the bodies of midget cars and scooters, boats, miners' safety caps, pipes and buttons. Polyester resin buttons are fast replacing shell-buttons and being exported in quantities.

Vinyl chloride resin—This is made from carbide and chlorine. Its production is the highest among Japanese plastics and the second highest in the world, only next to the United States. Low prices and easiness to mold are the biggest merits. According to the amount of plasticizer to put in, it can be either hard or soft. Soft vinyl chloride goes into the forms of films, sheets or leathers, and hard one into hard pipes and tubes, or boards.

Polystyrene—This is made from benzol and ethylene. Small in the rate of contraction, and easy to mold by the use of extruders, it is in brisk demand as molding resin. Transparent and easy of coloring, it is used for sundry goods and parts of teleforth by clients. In the case of daily necessities and sundry goods, too, they manufacture them on order from wholesalers. There are a good number of enterprises which are subcontracting or putting main emphasis on subcontract work. It seems that they have little difficulty in marketing their products, and that they are managing their businesses with relative ease.

The production of resin compounds is in the hands of larger enterprises. These compounds go to small and medium companies via either the agents of large enterprises or wholesalers. Some processing companies purchase resins directly from large manufactures for specific reasons in terms of quality or business relations between the two parties.

As there are many kinds of plastics and their qualities and characteristics are different, molding and processing methods differ accordingly. Basically, they could be divided into compression molding and injection molding methods. Compression molding is for thermosetting resins, and injection molding for thermoplastic resins. In the molding process of thermosetting resins, compression molding machines are principal equipment. They range from simple hand-presses to automatic, highly efficient transfer molding machines, but most of them in use are either hand-presses or oil-pressure type presses. A goodly number of these oil-pressure type presses are under 50 ton presses. Many of which 40 per cent are in Tokyo, 30 per cent in Osaka and 20 per cent in Aichi. In other words, these three centers account for roughly 90 per cent of the total. Of these enterprises, those with less than 20 employees take about 60 per cent. This clearly shows that small enterprises with a small number of workers predominate in the molding and processing industry. About 70 per cent of them seem to combine more than two processing processes. In many cases, specialized manufacture is regarded as desirable, but one of the recent trends in this industry is installation of various types of molding machines. From the stand-point of entrepreneural

stabilization, it is understanable to handle a variety of products. Generally speaking, medium-scale enterprises are engaged in production of goods for industrial use, and smaller enterprises in manufacture of sundry goods and other articles for everyday life.

Seen from the angle of processing, enterprises doing compression molding and processing of thermosetting resins top the list, accounting for nearly 65 per cent. For thermoplastic resins, injection molding and processing enterprises occupy about 16 per cent of the total, and extruding molding and processing enterprises, roughly 14 per cent.

Most of them adopt the production-on-order system. Actually they manufacture electrical parts and other products for industrial use according to specifications put vision and radios sets.

Polyethylene resin—Made from ethylene, this is the only resin among plastics that is lighter than water. Although weak to heat, it has many merits and various uses. Films account for the greater part of demands. They prevents moisture and are good wrapping materials for foodstuffs, medicines, tools, machines or sundry goods. They are also used increasingly for intensive culture. Being strong against percussion, they are widely being used for various containers, pipe joints, kitchen articles, etc.

*1) History of Development*

The recent marked development of industries and enhancement of living standards owe much to the development of the plastic industry. Any of the major countries in the world has been taking positive measures to encourage the growth of the plastic industry. In a short span of time, this industry has made spectacular development throughout the world. It is a few years ago that Japan established its position as a plastic-producing country, side by side with industrially advanced countries.

The output of plastic resins have been showing 40 to 60 per cent increase annually. The production index, with 1955 as the base, stood at 145.3 in 1956, 203.5 in 1957, 190.8 in 1958, and 284.5 in 1959. The 1959 figure was far more than 20 times as high as that of 1950. During this period, the petrochemical industry was born, and polyethylene and polystyrene came to be manufactured domestically. Today Japan ranks fourth in production of resins in the world, following the United States, West Germany and Britain. Its future prospects in this particular field of industry are so cheering.

Where small and medium enterprises can contribute are molding and processing sectors. They are in countless numbers throughout the country, and the processing of plastics except for basic plastic products such as bars, boards and pipes and films for agricultural use is mostly in their hands.

Many of the small and medium processing enterprises started as

petty cottage projects and gradually expanded their business scales as the resin-manufacturing industry developed.

Japan's plastic industry started with the manufacture of phenol resin in 1914. Until the outbreak of World War II, there had been only several kinds of resin, among which phenol resin was a principal item. The others included urea resin, alkyd resin, cellulose acetate, vinyl acetate, and methacrylic resin. But these were just placed on the market. To the general public, therefore, plastics were phenol resins.

Phenol resins were widely used at households in the form of electrical parts, while the output of other plastics was a mere trifle, and they were used mainly for military purposes.

Most of the molding machines at that time were compressing molding machines, and right before World War II, injection machines were imported from the United States, West Germany, etc. and remodeled.

Entering World War II, plastics were mostly designated as war materials, and a substantial chunk of them was phenol resin. At military request, the production of vinyl chloride resin, polyethylene and polystyrene was pushed with much difficulty, and they were used for parts of telecommunication equipment, lining materials, etc.

Up until the Korean Incident after the war's end, many of the raw materials were subject to controls, and resins were placed under the rationing system. But after being molded, plastic products had no difficulty in finding their markets. The astounding development of the plastic industry in the United States, Britain and other industrially advanced countries, when introduced into Japan, dumfounded Japanese plastic manufacturers. The Japanese industry did not give up of course. Japanese manufacturers banded together to catch up with their counterparts in advanced countries through strenuous research efforts.

After 1952, production increased year after year and reached 330,000 tons in 1957. Thus the Japanese plastic industry clambered to the fourth rank in the world. In 1957, the start of the petrochemical industry the home manufacture of almost all plastic raw materials possible. Exports of plastic products as well as materials also tended upwards year after year. As explained above, the Japanese plastic industry has survived various hardships and tests during the more than 40 years since 1914—including depressions, wars, acute shortages of raw materials and keen competition with conventional materials such as glass, rubber, paper, metals, lumber, leather and ceramics.

*2) Present Situation*

It is impossible to grasp the plastic molding and processing industry in the right perspective due to absence of comprehensive statistics. Herein descriptions will be based on the survey that the Smaller Enterprise Agency conducted for the plastic molding and processing industry in 1957.

The postwar plastic molding and processing industry of Japan show-

ed remarkable progress. The following three major reasons seem to have made this development possible.

In the first place, the massproduction of various resins has been fairly under way. The postwar supply of phenol, vinyl chloride and other resin compounds has increased tremendously. Secondly, molding and processing machines have been modernized and their efficiency has been raised considerably. The home production and wide spread of injection machines has made the massproduction of complicated products at cheap prices feasible. The advent of vaccum molding machines, extruding machines and the like has contributed a great deal towards enhancement of efficiency in the plastic molding and processing industry. Thirdly, demands have been cultivated widely. To the consuming general, plastic products are novel and at the same time their superior qualities have stimulated demands in various fields.

The plastic molding and processing industry consists largely of small and medium enterprises, particularly petty ones. Even secondary processing (molded materials to products) enterprises are estimated at about 2,500 throughout the country, and when tertiary processing enterprises (from secondary products to finished products) are added, the number will top 10,000 . The actual situation is not clearcut, and it is hardly possible to distinguish secondary processing enterprises from tertiary processing ones.

Now mention will be made of those enterprises which manufacture products out of resins by the use of molding machines. It is said that they number about 2,500 in Japan, of the transfer molding machines for advanced processing are under three ounce models.

The compression molding and processing method is to heat and soften thermosetting resins in the form of powder or compound, put them into metal patterns, and then cool them into products. This method does not require complicated techniques and is suitable especially in case the manufacture of products is on a small scale. The compression molding machine, however, needs a tablet machine, a motor pump, an automatic thermostat, an air compressor, a superheater, and a horse gin. It also needs, as finishing equipment, a lathe, a table drilling machine, a table grinder, a buffing machine, etc.

Among machines and equipment for the processing of thermoplastic resins, injection molding machines are necessary mainly for polystyrene, polyethylene and vinyl chloride. In prewar days, four German machines and a British model were in operation, but after the war's end, molding machines have topped 800 units thanks to the home production of molding machines. The processing method is to have heated and melted resins injected from injection holes into metal patterns, and cool them. The molding process takes little time, and can massproduce plastic products. For vinyl chloride or polyethylene films, sheets and leathers. the calendar roll is needed. As the calendar roll costs about ¥15 million, the number of these rolls is not so high as yet. They are estimated at roughly 100 units throughout the country. The processing method is to

knead molding materials with a roll while heating, feed them into the calendar roller while hot, and stretch them into films.

For the manufacture of hard vinyl chloride products such as hoses and pipes, extruding machines are used. Many of the extruders in use range in screw diameter from 35 to 40 mm, and per unit cost is in the neighborhood of ¥500,000. Extruding machines number some 1,200 units throughout the country. There are also cases in which wire-coating equipment are attached to extruders to do the processing of wire covering. The processing method is to heat and melt compounds, extrude them from the die by the screw and mold them.

As to exports of plastics, they started in the latter half of 1953, and rose to $1,080,000 in 1954 and further to $2,540,000 in the following year. This sharp increase in exports is an evident proof that Japanese plastic products became so good in quality as to be competitive on the world market, and production costs lowered. Principal export items are sheets, films, boards, pipes, toys, hand-bags, rain-coats, table cloth, etc. and major destinations are Southeast Asian countries.

Exports of compound resins are also active. Vinyl chloride, melamine, acrylic, urea resins and polystyrene are being shipped to Argentina, Brazil and some other Latin American countries, Australia, Hong Kong, the Philippines, Thailand and India.

**Table 1: Production of Synthetic Resins** (Unit: t)

| | Thermosetting Resins | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Phenol | | | | Urea | | | | | |
| | Molding materials | Laminates | Paints, etc. | Sum. | Molding materials | Paints | For textile processing | For paper processing | etc. | Sum. |
| 1955.. | 6,861 | 2,125 | 2,024 | 11,010 | 12,563 | 22,459 | — | — | 4,910 | 39,932 |
| 1956.. | 9,649 | 3,702 | 3,231 | 16,582 | 18,457 | 29,346 | — | — | 4,223 | 55,617 |
| 1957.. | 10,804 | 5,000 | 3,518 | 19,322 | 21,820 | 37,418 | 9,234 | 1,019 | 823 | 70,382 |
| 1958.. | 10,043 | 4,333 | 4,011 | 18,387 | 25,064 | 43,132 | 12,289 | 773 | 856 | 82,114 |
| 1959.. | 14,072 | 8,694 | 6,738 | 29,504 | 31,165 | 56,413 | 15,575 | 3,237 | 910 | 107,300 |

| | Thermosetting Resins | | | | | | Thermoplastic Resin | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Melamine | | | | | | | | | | |
| | Molding materials | Paints | For textile processing | Decorative laminates | For paper processing | etc. | Sum. | Polymer | Polymer | Copolymer | Paste | Sum. |
| 140 | 807 | — | — | — | 1,442 | 2,389 | — | — | — | — | 32,370 |
| 195 | 1,283 | — | — | — | 2,166 | 4,110 | — | — | — | — | 55,895 |
| 206 | 1,434 | 945 | — | 242 | 3,229 | 6,057 | 6,190 | — | — | — | 108,538 |
| 263 | 1,650 | 793 | — | 526 | 970 | 6,795 | 6,488 | 78,074 | 12,034 | 1,501 | 91,609 |
| 308 | 2,458 | 1,366 | 1,576 | 746 | 2,225 | 8,679 | 18,301 | 61,884 | 15,193 | 3,014 | 180,091 |

**Source:** Statistical Year Book on Chemical Industries Ministry of International Trade and Industry.

## (2) Match Industry

Matches can be classified into the strike-anywhere-match and the safety match, according to the kinds of composition of the match-head and the side surface of the match box. The strike-anywhere-matches include the yellow phosphor (for the tip of the match stick) match, red phosphorus match, phosphorus sulfide match and non-phosphorous match. In Japan, the phosphorus sulfide match and they safety match are being manufactured.

### History of Development

Japan's match manufacturing dates back to 1876 when the manufacturing techniques of the lucifer-match were first imported from France, a match plant was constructed in Tokyo, and the production of the lucifer-match was commenced. The Government extended financial assistance to the factory and dispatched its technicians to France, Germany and Sweden to conduct investigation and survey of match industries in these countries. As a result, much had been learned from Sweden where the safety match was invented.

As the production of this plant got into smooth running order, the Government had match-importing firms amalgamated in 1879 into a sales company to market all products of the factory, banning sales of foreign matches.

This heavy Government protection enabled the burgeoning match industry to defend itself against foreign competition around 1880. Not only that, the industry started exporting some of its products in 1881.

The relative simplicity of match-manufacturing methods encouraged many of those ex-samurai who were thrown out of work as a result of the Meiji Restoration to venture themselves into this particular field of industry. But few succeeded in surviving the 1884 depression.

It was after 1880, when export match plants began to be established one after another in the Osaka-Kobe district, that the Japanese match industry made a full-scale development. In the Osaka-Kobe area, there were many Chinese exporters, who perceived the profitableness of the exportation of lucifer-matches to China. Export match plants dependent on Chinese capital in this area continued to grow without a hitch and built themselves up into a big group of enterprises. They still exist today.

The huge profits that Chinese exporters made on the exportation of Japanese matches owed much to cheap labor in the match industry. The manufacture of lucifer-matches which was started as unemployment relief work was established on the foundation of slum labor. As was the case with many other smaller industries, the match industry, being placed

under the control of commercial capital for long, did not improve its wage standards, thereby delaying industrial mechanization.

In 1879, the production of the safety match became possible in Japan, and in 1885, the manufacture of lucifer-matches was temporarily prohibited. However, the export was resumed in 1890 when demands for lucifer-matches in the northern part of China were enormous. In 1922, a banning on the manufacture of lucifer-matches was resolved at the Washington meeting of the International Labor Conference, and it was translated into reality in the following year. The majority of lucifer-match factories in the vicinity of Osaka were closed, and afterwards match plants came to converge on the vicinity of Kobe.

In the meantime, match exports continued to rise year after year, and export markets expanded to India and sometimes to the United States and European countries. The export trade was at its zenith between the closing years of the Meiji Era and the early part of the Taisho Era. Exports amounted to 600,000 to 700,000 match tons (1 match ton: 7,200 matches) a year, or nearly 80 per cent of the total production. The production scale was 1.5 to two times as large as the presnt one.

The match industry grew with the expansion of exports. Japanese match exports suffered a sharp setback after World War I when the match industry began to develop in countries which used to import Japanese matches, the trend became conspicuous towards boycotting Japanese goods, and the match trust of Sweden advanced into various parts of the world. In 1927, two match manufacturing companies with Swedish capital were established in Japan, and they came to control over 80 per cent of the total domestic production. In 1932, the Swedish trust withdrew capital from Japan, while export trade showed signs of recovery. But the export trade could not restore the prosperity that it had once enjoyed, and around 1933, the match industry plunged into excessive production. To cope with the depressive situation, the industry established the Japan Match Industry Association and adjusted production. Until the industry successful tided over the business slump, World War II occurred, placing the industry under strict wartime controls.

In 1948, these controls were lifted, and factories adopted the integrated work system to manufacture splints and packets, pushing industrial rationalization. Free competition led to the mushrooming of new match manufacturers; around 1950, their number topped 200, or about the same of prewar days. Due to the loss of overseas markets as a result of the war defeat, however, industrial facilities inevitably became excessive, and around 1961, some of the match makers came to go bankrupt. In the following year, the industry promptly formed an adjustment association in 1952 through which to restrict shipments and industrial facilities and stabilize business. This is the beginning of the control over the match industry which has been lasting until today.

## Present Situation

*Production Srtucture*

Japan's match production reached 449,000 match tons (according to

the Ministry of International Trade and Industry) in 1959, valued at ¥5,400 million. Smaller enterprises employing 300 workers or less accounted for 69 per cent of the total production amount and 71 per cent of the total output value.

**Production of Matches**

| Year | Production amount (1 mil. M.T.) | | | | | | Output value (¥1 mil.) | | |
|---|---|---|---|---|---|---|---|---|---|
| | Smaller Enterprises | | | | | Total | Smaller plants | % | Total |
| | 1–29 hands | 30–99 | 100–300 | Total | % | | | | |
| 1958 ..... | 29 | 93 | 159 | 281 | 69 | 408 | 3,473 | 70 | 4,943 |
| 1959 ..... | 22 | 106 | 184 | 312 | 69 | 449 | 3,862 | 71 | 5,452 |

The employees of the match industry numbered 8,400 as of December 1959, about 6,000 of whom were working in small and medium plants.

Match manufacturers numbered 87 as of June 1960 (according to the Japan Match Industry Association), 93.1 per cent of whom employed less than 300 workers each. And those enterprises hiring less than 50 hands accounted for 47.2 per cent. Nearly 30 per cent of the total are under private management, and half of the remainder are capitalized at less than ¥2 million each.

In the Japanese match industry, smaller enterprises are predominant in terms of number and production value. This may be attributable to the simpliicty of match manufacturing. Area-wise, Kobe is the biggest center of match production, accounting for 80 per cent of the total number of match manufacturers.

**Match Manufacturers Classified by Number of Employees**

| Scale | No. of enterprises |
|---|---|
| Less than 30 hands ..... | 11 |
| 30— 49 ..... | 30 |
| 50— 99 ..... | 20 |
| 100—199 ..... | 14 |
| 200—299 ..... | 6 |
| Over 300 ..... | 6 |
| TOTAL ..... | 87 |

*Production Process of Splint Plant*

Material wood (white popular, white ash, or walnut), after being brought in, is cut crosswise in lengths of about 40 centimeters, unbarked, and then fed into the machine to make long, thin strips of wood of the width of a matchstick's length. Usually one machine is capable of producing seven thin strips of wood at once. Then stack them in a row

to a height of about 10 centimeters and to about one meter long, and cut them into splints. The machine is capable of manufacturing 15 to 20 million splints every day.

For export, these splinters are dipped in phosphatic solution so that after being burnt and carbonized, they may not fall, or in some cases are dried by the drying machine, sunshine or drying chamber after being dyed, until the water content goes below 12.5 per cent. If the whiteness of splints is required, matchsticks are put into the bleaching chamber and bleached with sulphurous acid gas.

*Production Process of Match Plant*

Splints go through the splint selecting machine to remove inferior ones, are put into cases (containing 20,000 to 25,000 pieces) by the use of the broken splint selection and feeding machine, and then are put side by side in the wooden frame by the use of the frame filing machine. In each frame, 2,500 to 2,700 splinters stand.

These frames are placed on the conveyor. While they are moving on the automatic parafining machine, splints are dipped in parafin solution up to half the length to make them burn readily, dried up, and tipped with match-heads. The daily productive capacity ranges from 20 million to 25 million pieces.

Those frames which house matchsticks tipped with combustible substance are put on flatcars. They are erected upwards first, turned downwards later on in order to form the match heads in globular shape, dried under a temperature of less than 40 degrees C in the drying chamber or by sunshine, and unpacked by the frame removing machine. Matchsticks are placed on trays, and put into match boxes by factory girls. Skilled workwomen can make one grip of the almost exact number of matchsticks for each box (usually 65 pieces) and make 3,500 to 3,600 boxes a day.

The match boxes are placed on the belt of the side phosphate coating machine, are coated with chemicals on two sides, and dried by not wind or infrared ray. Then they are wrapped up in paper and put into corrugated carboard or wooden cases. Export match boxes are packed with galvanized iron sheet and welded at seams in order to keep them free from damp.

The manufacture of splints is a part of the match production process, and as a matter of course splint-making facilities are supposed to be installed within match-manufacturing plants. In fact, there are no actual cases of those specializing in splint production throughout the world, except in Japan. In Japan, splint makers who had developed as part of the lumbering industry existed in considerable numbers, partly because the match-manufacturing industry was operated with scarce capital and partly because the export of splints was fairly good. After the controls on the manufacture of matches were lifted in 1948, there were 54 enterprises specializing in splint production and 18 engaged in integrated production process, from splints to matches. At present splint

makers have decreased to 21, about half of whom are in wood-producing centers and the Tohoku district. They are now accounting for roughly 37.6 per cent of the total splint production.

*Machinery and Equipment*

According to the Japan Match Manufacturers' Association, the match industry possesses 585 frame filing machines, 87 paraffining and dipping machines, 128 side phosphor coating machines, 60 outer paper box making machines, 30 splint drying machines, 142 JMMA-type splint selecting machines, 56 JMMA-type broken splint with tip selection machines, 68 JMMA-type broken splint selecting machines, two household match drying machines, and two sack machines.

Among these machines, the installation of frame filing machines is regulated by the ordinance of the Ministry of International Trade and Industry, and their operation rate is 66 per cent of the total capacity (52,650 match tons a day). Many of them were imported from Germany in the Meiji Era (1867-1912) and are primitive models. The match industry has recently started efforts for drastic rationalization and modernization.

*Characteristics of Demand and Distribution*

The domestic consumption of matches averages 6.25 splints a day per capita and 430,000 match tons a year. The determinants of the match demand include the consumption of tobacco and the number of households. Since the consumption of matches is estimated at 55 per cent of that of tobacco, the match consumption increases by about 10,000 match tons when the tobacco consumption rises by 5,000 million cigarettes. The match consumption per household is estimated at about 15 splints a day. But the minus factor is the spread of gas-lighters and electric rice-cooking pots. When they are spread 100 per cent, the match demand will drop by about 45 per cent. Nowadays gas-lighters and electric appliances are cutting into the match demand, but the recent conspicuous increase in tobacco consumption makes up for the encroachment by modern gadgets.

Match retailors number 500,000 throughout the country. As the sales amount of each retailor is very small, it is almost impossible for the match maker to directly sell products wholesale to these retailors. Therefore makers depend totally on wholesalers for distribution of their products. Few of these wholesalers specialize in handling matches. most of them are sundrymen, attaching importance to goods other than matches. Match manufacturers rush to influential wholesalers, and therefore the market is chronically a buyer's market. Such characteristics of the distribution system hamper the sound management of match makers.

*Export Trade*

The Japanese match industry had lost almost all markets through-

out the world as a result of the war defeat. Exports of matches, therefore, dropped to one-twentieth of the prewar level. It is next to impossible to boost exports to the prewar scale, but the industry is making desperate efforts to cultivate overseas markets. Export prospects are not so bright, however, because the match production and sales are subject to rigid government regulations in most of the countries.

**Match Production, Sales**

| Year | Production | | Sales | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Exports | | Domestic | | Total | |
| | Volume | Value | Volume | Value | Volume | Value | Volume | Value |
| 1956 ..... | 432 | 4,063 | 17 | 167 | 408 | 3,812 | 425 | 3,979 |
| 1957 ..... | 459 | 5,163 | 16 | 180 | 435 | 4,905 | 451 | 5,085 |
| 1958 ..... | 408 | 4,943 | 15 | 185 | 398 | 4,811 | 413 | 4,996 |
| 1959 ..... | 449 | 5,452 | 14 | 177 | 437 | 5,307 | 451 | 5,484 |

**Source:** Ministry of International Trade and Industry.

## Organization of Industry

The match industry is subject to adjustments of shipment every quarterly under the Government directive. As mentioned before, the installation of machines and equipment is also regulated. All these matters are being handled by the Japan Match Kogyo Kumiai. This organization introduces restrictions on domestic shipment volume and methods, prices, qualities and machinery and equipment. It has been playing an important role in enabling the industry to adjust its facilities to a proper size after new match makers mushroomed in and after 1948 when controls on the manufacture of matches were removed.

Going side by side with this association, the Japan Match Cooperation (established in 1938) is rendering financial assistance to its members by means of inventory finance or discounting bills at depressions, in order to help stabilize the prices of matches.

The Japan Match Manufacturers' Association is another important organization in the match industry. Within this association, there are chemical and machinery research institutes which have been contributing a great deal towards improvement of the qualities of matches and rationalization of production. Since 1955, it has played a vital role in pushing the Japan Industrial Standards system in the match industry, and also in planting Italian popular in an effort to solve a shortage of material wood for splints.

The match industry in Japan is always pregnant with a crisis of over-production. But powerful measures are being taken to improve working conditions, accelerate industrial rationalization and encourage exports. They are now bearing satisfactory fruit.

## (3) Umbrella and Umbrella Rib Manufacturing Industry

### (1) Historical Background

It is said that umbrellas were imported into Japan for the first time around 1820. Around 1877, those who processed imported materials into umbrellas began to appear. It was after about 10 years that the complete domestic production of umbrellas, from materials to finished products, got started. After the integrated production of umbrellas became feasible, the prices of umbrellas came down, domestic prices, soared, the production of grooved ribs increased fast.

As the manufacture of umbrellas became lively, the wholesale system came into existence in this industry, and the capital strength of wholesalers went a long way towards improvement of umbrella materials and processing techniques. Umbrella ribs were produced mainly in Tokyo at that time.

Around 1897, the manufacture of umbrellas showed considerable technical progress and met domestic demands. Products were also shipped to Southern regions, chiefly Shanghai and Hong Kong. The annual export value was in the region of ¥1 million in 1902-03, but the umbrella industry was regarded as an export industry.

Manufacturers of umbrellas ribs and fittings gradually increased, and division of work became possible. First of all, those coating umbrella ribs and then those purchasing, processing and assembling metal materials established themselves independently one after another. Before long the umbrella parts industry had been set up as a small-scale cottage industry.

After the Russo-Japanese War ended in 1905, domestic demands for umbrellas increased, and export markets were opened up in Korea, North China, Manchuria, India, Africa, Europe and the United States. To India, Manila, Canton, Shanghai and some other destinations, finished products were unable to be exported for tariff reasons, and therefore umbrella parts were shipped.

The outbreak of World War I in 1914 suspended the inflow of quality materials into Japan and encouraged research on the tempering of high steel. The success of research work for two years exerted big influence upon Japanese umbrella manufacturers. The stoppage of German products to Hong Kong as a result of World War I offered golden opportunities for Japanese umbrella makers to expand their market in the Crown Colonoy. Makers in Osaka capitalized on these export opportunities and specialized in export. Thus manufacturers in Tokyo who specialized in meeting domestic demands and makers in Osaka who were engaged main-

ly in export had established their respective positions.

Entering the Showa Era, production continued to soar year after year. In 1937, the annual production reached 800,000 dozens, exports 550,000 dozens, umbrella ribs 1 million dozens, sticks 340,000 dozens, handles 1,130,000 dozens, and fittings 1,340,000 dozens. After the country entered World War II, however, both production and exports were on the decline. When the war broke out in 1941, the main materials for umbrella manufacturing—high steel and burnished band steel—became subject to controls, production fell sharply, and manufacturers switched to subcontractors for munitions factories.

When the war terminated in 1945, production amounted to a mere 20,000 dozens, or only 2.5 per cent of the 1937 production for domestic consumption. But it recovered steadily, and reached about 750,000 dozens for domestic consumption in 1955, exports 234,000 dozens, and exports of ribs 540,000 dozens.

The industry consists of metal material makers, notch and runner makers, stick makers, painters, gilders, and assemblers. These frame makers converge on Tokyo and Osaka. Umbrella makers are scattered throughout the country, but the productive centers are Tokyo, Osaka and Nagoya. In local districts, they combine repairing and retailing businesses. Since umbrellas can be made easily with sewing machines and cutting boards, they are in most cases merchants rather than manufacturers. They manufacture umbrellas between February and July, and sell knitted goods, shawls, ready-made clothing, etc. by wholesale.

*Present Situation*

Characteristic of this industry is the absence of manufacturers adopting the integrated work system. The integrated work includes the purchase of umbrella sticks, the fixing of main ribs and stretchers, springs, and notches and runners thereon, and the stretching of cloth.

Now mention will be made of the production process of umbrella ribs and parts.

(1) *Material metals*—There are two kinds of materials for umbrella ribs. They are high steel rods and special burnished band steel. In the case of high steel, rods are put into the annealing furnace, annealed for five hours at a temperature of 800 degrees, immediately thrust into the furnace of 600 degrees in temperature, rolled into the so-called ribbons, and grooved. In the case of special band steel materials, they are ribbons themselves ,and therefore only the grooving process is enough. Grooved materials are quenched at a temperature of 900 degrees, cooled with quenching oil, oils and fats, and water, annealed to 500 degrees, and cut in proper length. The quenching work is difficult, and research is being continued in this field. There are oil furnaces and electric furnaces. Some of the electric furnaces in operation are automatically controlled with thermometers.

(2) *Metal shafts*—There are two kinds of rod-manufacturing methods according to the materials used. In the case of thin and band steel, it must be formed into pipes, but when brass pipes are used, that process can be dispensed with. Thin or band steel must be cut in the desired length and width, rolled flat, wraped into a U-shape, and then formed into pipes with the seams welded. The ferrule is blunted and welded ed by thrusting iron rods. The holes for two springs are opened, and the metal shafts are washed by sulphuric acid, dried, plated, painted and cleaned with puffs. Lastly catch spring are fixed onto the shaft.

(3) *Notches and runners*—The upper notch is made is brass bar which is drilled so that the metal shaft can go through. Then grooves are cut into the notch to hold main ribs. The lower runner uses pipes.

(4) *Ribs*—Umbrella rib makers purchase metal shafts and notches and runners from respective makers, select material metals, cut them in proper length, blunt both ends and press them together with iron core inside. In the case of stretchers, only the end of the stretcher which connects with the runner is pressed. The holes are bored on both ends, and either joints or rings are fixed to the main ribs. The main ribs and stretchers are connected together, painted and plated. With the notches, runners and metal rods, they make umbrella frames. Umbrella makers purchases these frames and cover them with cloth. Umbrellas cloth materials include gingham, silk, silk-rayon, rayon, acetate, vinyl chloride, etc. The production of collapsible umbrellas shows a steep increase in recent years.

According to the Census of Industry conducted in 1957, umbrella-making and rib-making workshops number 736,—54.8 per cent of which (404) employed less than three workers each. Another survey showed that there were 168 rib and stretcher makers. Judging from both surveys, umbrella makers were estimated at 568, or 77.1 per cent.

Although accurate statistical data are not available, it seems that roughly 70 per cent of these umbrella makers are of such a small scale as to employ not more than three workers. The reason for the large number of petty enterprises is the impossibility of mass-production due partly to so many different kinds of umbrellas and their designs and due partly to seasonal fluctuations in demands or weather conditions. Women's umbrellas or parasols take roughly 50 per cent of the production, men's 15 per cent, and children's 35 per cent. Particularly women's umbrellas and parasols are not suitable to the mass-production process because of fast-changing fashions in color and design. But a few enterprises of fairly large scale are engaged in mass-production of umbrellas using chemical and synthetic fibers.

According to the Japan Federation of Umbrella Rib Industrial Associations, 168 rib making enterprises exist in Japan. They are all falling in the small and medium enterprise category, employing less than 200 workers each. Of them, those with less than 50 account for 90.4 per cent, numbering 152. About 40 per cent of them are under private management.

Area-wise, Tokyo and Osaka account for more than 90 per cent of the total umbrella production. While Tokyo is manufacturing umbrellas for domestic consumption, Osaka concentrates on exports. About 80 per cent of the total exports are manufactured in and shipped from Osaka. The manufacture of collapsible umbrellas, which recently shows a marked incraese, is mainly in Tokyo.

In respect to umbrella rib makers, there are 110 enterprises in Osaka, or 65 per cent of the total, and 51 in Osaka, or 30.3 per cent. Just as in the case of umbrella makers, exports are manufactured chiefly in Osaka.

The production of umbrellas and parts, according to the Census of Industry, was valued at ¥7,417 million in 1957. Smaller enterprises, with less than 50 workers, accounted for 75.2 per cent of this production value.

**Umbrella, Parts Makers**

| Scale | No. of workshops | No. of employees | Production value (¥1million) |
|---|---|---|---|
| Less than 3 workers..... | 404 | 987 | 498 |
| 4— 9 ..... | 163 | 995 | 878 |
| 10— 29 ..... | 131 | 2,131 | 2,814 |
| 30— 49 ..... | 24 | 902 | 1,389 |
| 50— 99 ..... | 12 | 1,093 | 1,838 |
| 100—199 ..... | 2 | | |
| TOTAL..... | 736 | 6,108 | 7,417 |

**Source:** Census of Industry, Ministry of International Trade and Industry.

With regard to exports, umbrella exports account for 20 per cent or so of the total umbrella production, and ribs and fittings, 22 per cent. The Finance Ministry's statistics showed that these exports were valued ¥1,824 million in 1957, or some 24.5 per cent of the total production. Umbrellas accounted for 62.2 per cent, or 436,000 dozens (¥1,134 million in value). The largest market was the United States which bought 228,000 dozens of Japanese umbrellas (52.2 per cent) valued at ¥499 million (44 per cent).

Exports of umbrella parts amounted to ¥689 million, or 37.8 per cent of the total exports. To the United States, 300 tons (15 per cent) were shipped, earning ¥127 million (18.4 per cent). Umbrella ribs occupied 60.5 per cent of the umbrella parts exports. The United States also topped the list, taking 25 per cent. It was followed by South Korea (16 per cent) and India (15 per cent).

Recently exports of umbrella ribs and fittings are running level, while umbrella exports are increasing year after year. Exports to the U.S. market, specially cheap stuffs for advertising and other publicity purposes, show remarkable increase. In 1958, the industry shipped a big amount of umbrellas and parts to the United States before it was forced to apply self-restraint measures. In 1959, there were moves to curb um-

brella imports from Japan, and since February, the Japan Sundry Goods Export Association and the Japan Export Umbrella Industry Association have been regulating shipments to the United States. However, exports to Canada, Australia and other destinations have increased sharply. Rayon umbrellas have come to account for half of exports, and vinyl chloride and acetate umbrellas also show notable rises.

Export markets for umbrella ribs and parts are mainly Southeast Asia and North America. Except to India and the United States, these exports show considerable declines in recent years, but these declines are barely covered by increased shipments to Africa, Latin Amrica and Oceania. In the meantime, exports of umbrella ribs to the United States have been also curbed by the Japan Sundry Goods Export Association since 1959. The Japan Federation of Umbrella Rib Industrial Associations is about to adjust shipments of umbrella ribs and parts in an effort to stabilize overseas markets.

**Umbrella Export Value by Kinds of Covers**

(Unit: 1,000 dozens, ¥1 million)

| Year | Cotton cloth | | Silk, silk mixtures | | Others | | Total | |
|---|---|---|---|---|---|---|---|---|
| | Volume | Value | Volume | Value | Volume | Value | Volume | Value |
| 1955 | 422 | 386 | 1 | 5 | 110 | 254 | 233 | 645 |
| 1956 | 628 | 403 | 3 | 12 | 218 | 506 | 849 | 921 |
| 1957 | 132 | 399 | 2 | 13 | 302 | 722 | 436 | 1,134 |
| 1958 | 139 | 399 | 2 | 17 | 577 | 1,203 | 718 | 1,619 |
| 1959 | 171 | 495 | 5 | 37 | 581 | 1,378 | 757 | 1,910 |

**Source:** Finance Ministry.

**Exports of Umbrella Parts**

| Year | Volume | Value |
|---|---|---|
| 1955 | 2,001 tons | ¥476 million |
| 1956 | 3,180 | 948 |
| 1957 | 2,109 | 689 |
| 1958 | 1,011 | 295 |
| 1959 | 1,049 | 319 |

**Source:** Finance Ministry.

**Note:** Figures for 1958 and 1959 show only steel ribs.

## (4) Leather and leather goods manufacturing industries

### (1) History

Leather tanning in Japan has a very long history, started in ancient times. The leather tanning techniques in old days, however, placed main emphasis on dyeing processes and are worthy of no special mention with only a few exceptions.

It was after the adoption of the Western-style armed forces system during the Meiji Restoration (1868) that modern tanning techniques were first introduced to Japan. The adoption of Western armed forces system required special leather for use in the manufacture of military shoes, bags, knapsacks and harnesses, making it necessary for Japanese leather manufacturers to make a fresh start by importing the leather tanning techniques of Western countries.

The introduction of Western leather tanning techniques was first made in 1869 when several German technicians, including Heinrich Kembel, were invited to Japan and a special school for leather making was established in Wakayama City. The foundation of modern leather tanning techniques in Japan was established four years later with the visit of an American technician, Charles Henry. The creation of Western-style armed forces, coupled with the Westernization of the people's living, increased the demand for leather goods year after year, and the old handicraft was developed into a modern, mechanized industry, establishing its foundation in Tokyo and Osaka. During the Sino-Japanese and Russo-Japanese wars, the products of the industry played an important role, and Japan's leather manufacturing industry made a signal development both quantitatively and qualitatively.

Subsequently, efforts were made for the acquisition of modern tanning techniques, including those for chrome tanning, by inviting American and German technicians. Since Japan played the role of the commissary department of the Allied Forces during World War I, Japan's leather manufacturing industry made a rapid development, ranking third in the world, following the United States and Germany, in the volume of products. Until around 1941, the industry had enjoyed a boom with stabilized production. With the outbreak of World War II, however, the acute shortage of raw hides as well as the streamlining of enterprises based on the National Mobilization Law decreased the number of leather makers sharply. Production also tapered down, falling almost to the nil at the end of the war.

The postwar recovery of the industry was rather slow due to various controlling measures. It recovered gradually, however, and with the removal of controls in 1949, it was rehabilitated fast, supported by vigor-

ous demands which had not been supplied fully during the 10-year period after the termination of the war. The subsequent outbreak of the Korean War resulted in active special procurement orders from the United Nations forces, and activated enterprises invested the bulk of their profits in equipment expansion, signally enlarging their production capacities.

Meanwhile, Japan's leather goods manufacturing industry established its basis with the production of military shoes. That is, shoe-making techniques were introduced to Japan along with leather manufacturing techniques for the purpose of manufacturing military shoes. With the subsequent increase in military orders for shoes, the number of private enterprises increased, and towards the end of the Meiji Era (1868-1911), the foundation was established for the development of such modern, big enterprises as seen today. Contributing immensely to the development of the industry were huge Russian orders for military goods received during World War I. The Soviet orders for leather goods for military use (including boots, belts, cartridge containers, harnesses, etc.), received during nine months, were four times as large as the demands for leather goods by Japan's Army Ministry for full one year. The leather goods manufacturing industry, which had already expanded its production capacity to meet brisk military orders, came to enjoy an unprecedented boom thanks to the Russian orders. The favorable effects of World War I, however, were not limited to the fact that it helped major enterprises to solidify their foundation. It must not be overlooked that the war also helped to activate civilian demands for leather goods gradually by stimulating the general business condition. That is, with the progress of industrialization, the number of salaried persons and wage earners increased, and this, coupled with the change in the mode of living of the Japanese people resulting from the development of the traffic network, gradually boosted the civilian demand for leather goods, including men's shoes, children's shoes, travelling bags, and other bags and pouches.

The leather manufacturing industry, which had first been developed with military demands, thus came to enjoy both military and civilian demands between the late Taisho (1912-25) and early Showa (1926- ) Eras. It also came to have a small number of big enterprises on the one hand and many smaller enterprises on the other. During the period from the Showa crisis and World War II, the industry again came to depend heavily on military demands, and it can be said that it was after the end of the war that it made a full-fledged development as a civilian industry.

After World War II, the leather industry lost its military demands and made a new start as a completely civilian industry and since has been making a comparatively favorable development. In the period immediately after the war when the nation was suffering from a miserable shortage of daily necessities, including foodstuffs and clothing, leather goods were considered "valuables," due partly to Government control.

With Japan's economy emerging from the stage of reconstruction and entering the stage of development, the production of leather goods went up and their demands also increased. With the removal of Government control in 1950 and the subsequent resumption of trade on a private basis, the import of foreign raw hides became easy, and leather goods production came to be started in real earnest. On the other hand, the radical change in the mode of the people's living resulted in a sharp increase in the demand for women's shoes, handbags, bags and even leather coats. With the industry surviving the keen competition with synthetic resin products, the production of leather goods chalked up a new record in 1957, surpassing the previous high established in 1941.

### (2) Present conditions

Japan's leather industry depends on foreign countries for the supply of the majority of needed raw hides and tanning extracts. Besides, the degree of processing is relatively small in the industry. As a matter of fact, in leather manufacture, as well as in shoe-making, the cost of raw materials accounts for 70 to 80 per cent of the cost of finished products. Therefore, the international competitive power of the industry is rather small despite the low wages for processing workers.

Thus, Japan's leather industry, which depends on imports for the supply of needed raw materials and whose processing degree is rather low, is not promising as an export industry, although exporting a small part of its products after the war. Besides, its production inevitably tends to be stagnant. According to a survey on the nation's mining and manufacturing production by the Ministry of International Trade and Industry, while leather production has already surpassed its prewar peak (indices for 1941, 120.5; 1955, 100; 1957, 122.9; and 1959, 124.4), overall mining and industrial production, chemical and rubber goods production have already expanded to two or three times as large as their prewar level. This indicates that Japan's leather goods production is considerably stagnant. The stagnant production is also responsible for the fact that the industry is composed of only few big enterprises on the one hand and a large number of smaller enterprises on the other.

Approximately 80 per cent of the total demand for raw hides in Japan is accounted for by imported products. On the customs clearance basis, during 1959, a total of 86,828 tons of raw hides and skins, valued at ¥15,312 million, were imported. The largest supplier was the United States which accounted for 40,206 tons, or 46.3 per cent of the total. Item-wise, cattle hides reached 68,989 tons (79.4 per cent of the total), of which the United States accounted for 37,750 tons (54.7 per cent), Australia, 14,596 tons, and New Zealand, Thailand, Canada and others, the remainder. The imports of horse hides totaled 6,933 tons, of which 4,536 tons (65.4 per cent) were imported from Argentina, and the remainder from Australia, Communist China, the Netherlands, South Africa and others in the order mentioned. Calfskins and kip skins were 5,841 tons, of which 2,442 tons (41.8 per cent) were accounted for by

Australia, 1,988 tons, by the United States, and the rest, by other countries. Sheep skins and lamb skins reached 1,865 tons, of which 1,385 tons (74.2 per cent) came from India and Pakistan, 249 tons from the United States and others. Buflalo hides reached 1,629 tons, of which 1,374 tons (84.3 per cent) were imported from Thailand, and the rest from Southeast Asian countries.

The tanning extracts imports aggregated 22,241 tons valued at ¥1,571 million, major suppliers being Argentina, the United States and India.

Thus, Japan's leather industry imports the bulk of the raw materials it needs. Inasmuch as the raw hide price fluctuates rather sharply in overseas markets, Japan's leather industry is rather unstable, greatly influenced by changes in overseas market conditions. For instance, despite the downward trend of the domestic prices of leather goods, due partly to the advance of synthetic resin products in their fields of demand, the imports of foreign raw hides in 1959 increased as much as 62 per cent in monetary value over the previous year due to a price markup resulting from their worldwide shortage, although their increase was only 15 per cent in quantity. This, coupled with a three per cent rise in the tannin price, indicates the trend of "low price of finished products and high cost of raw materials" in Japan's leather industry.

According to a census of manufactures taken by MITI in 1957, the number of establishments in the leather industry was 5,800 with a total of 44,000 persons engaged, and their aggregate annual output was ¥55,300 million in monetary value. Of the 5,800 establishments, as much as 65.1 per cent was accounted for by ultra-small household establishments each having not more than three persons engaged.

In the leather products industry there were 4,983 establishments having a total of 33,254 persons engaged, whose total production was ¥32,800 million. Among them, small establishments having not more than 49 persons engaged each occupied an overwhelmingly large part, that is, 98.9 per cent in the number of establishments, 81.3 per cent in the number of persons engaged, and 78.6 per cent in the monetary value of production. In the leather products industry, ultra-small establishments each having not more than three persons engaged accounted for as much as 67.1 per cent of the total number of establishments.

By production items, the list of leather goods manufacturing enterprises was headed by the manufacturers of leather footwear such as shoes (including the manufacturers of materials and accessories of leather footwear), followed by the manufacturers of leather luggage and handbags. That is, leather footwear manufacturing industry accounts for 51 per cent of the whole leather goods manufacturing industry in the number of establishments, 47.5 per cent in the number of persons engaged and 44.4 per cent in the value of products, while luggages and handbags manufacture occupied 34.1, 34.3 and 36.8 per cent, respectively. These two groups combined to account for 85.7 per cent of the total in the num-

ber of establishments, 81.8 per cent in the number of persons engaged and 81.2 per cent in production. Other major branches of the leather goods manufacturing industry include the manufacture of leather goods for industrial use such as belts, packings and goods for spinning, and the manufacture of gloves.

Outlined above is the scale of establishments according to the number of persons engaged in the leather manufacturing industry and the leather goods manufacturing industry.

As was explained, in the leather manufacturing industry there is no such difference in the scale of enterprises as seen in many other industries, with the larger and smaller enterprises turning out almost the same quantity of products. This is because it is possible for these enterprises to engage in the mass production of special items according to their business scale, such as belt leather and sole leather (these two items are manufactured mostly by big enterprises), chrome shoe leather, fatty leather and others (these are manufactured mainly by medium and small enterprises). On the other hand, in the leather goods manufacturing industry, the smaller enterprises whose persons engaged are not more than 49 each account for the bulk of the industry's total production. The reason for this is that each enterprise has to produce various different kinds of goods and it is difficult for enterprises to engage in mass production of one or two special items since leather goods are for final consumption and therefore their production is largely affected by the taste of consumers. This fact explains the difference between the leather manufacturing industry and the leather goods manufacturing industry in their production according to the scale of enterprises.

The leather industry is geographically concentrated in several areas. Major production centers are Tokyo (40 per cent), Hyogo (30), Wakayama (10) and Osaka (8) prefectures for the leather manufacturing industry, while the leather goods manufacturing centers are Tokyo and Osaka which are located favorably for the domestic sale of the products.

With medium and small enterprises occupying an overwhelmingly large part of the industry and its production concentrated in several areas, the leather industry is pushing the formation of joint enterprises by organizing cooperative unions as a means to rationalize business management. Approximately 75 per cent of all enterprises has membership in these cooperative unions, which are engaged in production, processing, experiments, researches, financing and sale.

According to the Overall and Basic Survey on Medium and Small Enterprises conducted by the Small Enterprises Agency in 1957, the machinery equipment condition of the leather industry was as follows: The leather manufacturers had 6,589 tannin tanks, 3,795 lime tanks and 1,931 drums. The leather foot-wear makers had 244 scoop-sewing machines and 2,336 sewing machines (including those for shoe-making). The bags manufacturers had 2,278 sewing machines. The pouchers

makers had 1,084 sewing machines.

In the following paragraphs, the leather making processes, and the processes of the manufacture of shoes, which are representative among leather goods, will be explained, although this involves difficult technical problems.

The leather making processes are divided into the preparatory work, tanning and finishing processes. Imported raw hides and skins are often dried and salted hides. Therefore, they are first dipped in water and softened. After miscellaneous small things sticking to them are eliminated, the raw hides go through the processes of depilation by the use of quicklime, straining (for the required thickness), elimination of lime, and the rubbing with stone for removing the milky fat and the hair roots which still remain within them. These processes form the preparatory work. This is followed by the tanning process in which a solution of tanning material is used. The tanning material as well as the time required for tanning differs according to the use of the leather. Thick leather for the manufacture of shoe soles and belts requires a longer time. To decide the suitable density of the tanning solution and time for tanning requires very high techniques—most important in the entire process of leather manufacture.

The manufacture of thick leather which requires a long time for tanning inevitably reduces the turnover rate of funds, and therefore, is difficult for small enterprises. It used to take as many as six months for the solution to penetrate into thick leather for shoe soles. At present, however, the time required has been shortened to two months or so due to various measures including shaking the solution. In the manufacture of shoe leather, new techniques, including a drying method using glass, have been introduced. This new method is designed to make an artificial grain layer. Imported raw hides are usually stained and damaged by insects while the cattle is pastured. Therefore, their surface is planed, and some drugs, such as synthetic resin, are applied to their surface. Then they are put on a sheet of glass to make an artificial grain layer. The adoption of this method has resulted in an increased yield rate, and besides, due to automatic adjustment of humidity and temperature, the time required for drying has been shortened, making it possible for the manufacturers to cut the cost of production drastically. The finishing processes include drying and dyeing.

In shoe-making, soles and other parts are manufactured in separate processes, and then they are combined into finished products. There are, however, only few makers engaged in all these processes. Large and medium enterprises having well-mechanizd plants are usually engaged in the work of combining these two parts while utilizing ultra-small household enterprises as their sub-contractors for the manufacture of other parts than soles. On the other hand, small enterprises usually manufacture the parts other than soles while depending on larger and

mechanized plants for the work of combining their products with soles, and sell the finished shoes. There are different ways of combining soles and other parts. One way is to sew the main sole, upper sole and instep-covering part together. Another way is to sew the instep-covering part and the welt first and then sew the welt and the main sole together. In a recently introduced method, a powerful adhesive is used in place of needles and threads. Those shoes whose soles and other parts are sewn together with a machine are called "machine shoes." When this process is done partly with a machine and partly by hand, the shoes are called "semi-machine shoes." When the entire process is done by hand, the shoes are called "hand-sewn shoes." Recently, however, the use of

**Leather and Leather Products Establishments**

| | No. of establishments | Size of persons engaged | | | | | |
|---|---|---|---|---|---|---|---|
| | | -3 | 4-19 | 20-49 | 50-99 | 100-299 | 300- |
| Leather tanning and Finishing | 815 | 381 | 310 | 94 | 20 | 8 | 2 |
| Industrial leather | 162 | 80 | 61 | 17 | 2 | 1 | 1 |
| Leather foot-wear and others | 2,572 | 2,006 | 409 | 121 | 21 | 12 | 3 |
| Leather gloves and mittens | 192 | 64 | 91 | 36 | — | 1 | — |
| Luggage and handbags | 1,703 | 966 | 624 | 102 | 10 | 1 | — |
| Leather goods, n. e. c. | 354 | 242 | 97 | 13 | 1 | 1 | — |
| TOTAL | 5,789 | 3,739 | 1,592 | 383 | 54 | 24 | 6 |

**Source:** Census of Manufactures, 1957, the Ministry of International Trade and Industry.

**Persons Engaged of Leather and Leather Products Establishments**

(in ¥1 million)

| | No. of persons engaged | Size of persons engaged | | | | | | Remarks |
|---|---|---|---|---|---|---|---|---|
| | | -3 | 4-19 | 20-49 | 50-99 | 100-299 | -300 | |
| Leather tanning & finishing | 10,652 | 999 | 2,901 | 2,810 | 1,292 | 2,650 | | Persons engaged in 100-299 group total 702 |
| Industrial leather | 1,794 | 187 | 510 | 487 | 610 | | | |
| Leather foot-wear | 15,843 | 3,686 | 3,848 | 3,410 | 1,474 | 3,425 | | Persons engaged in 100-199 group total 1,351 |
| Leather gloves & mittens | 2,133 | 165 | 853 | | 1,115 | | | Persons engaged in 20-29 group total 599 |
| Luggage & handbags | 11,426 | 2,284 | 5,477 | 2,975 | 690 | | | |
| Leather goods, n. e. c. | 2,058 | 537 | 1,339 | 182 | | | | |
| TOTAL | 43,906 | 7,858 | 14,928 | | 21,120 | | | |

**Production of Leather and Leather Products Establishment**

(in ¥1 million)

| | Production | Size of persons engaged | | | | | | Remarks |
|---|---|---|---|---|---|---|---|---|
| | | -3 | 4-19 | 20-49 | 50-99 | 100-299 | 300- | |
| Leather tanning & finishing | 22,520 | 1,384 | 4,335 | 5,481 | 2,656 | 8,654 | | Output of 100-199 group: ¥2,633 million |
| Industrial leather | 2,082 | 139 | 486 | 392 | | 1,065 | | |
| Leather foot-wear | 14,569 | 1,891 | 3,681 | 3,887 | 1,195 | 3,915 | | Output of 100-199 group: ¥1,371 million |
| Leather gloves & mittens | 1,934 | 66 | 506 | | 1,364 | | | Output of 20-29 group: ¥803 mil. |
| Luggage & handbags | 12,081 | 1,117 | 6,216 | 3,915 | 833 | | | |
| Leather goods, n.e.c. | 2,141 | 284 | 1,556 | | 291 | | | |
| TOTAL | 55,329 | 4,881 | 16,800 | | 36,648 | | | |

**Source:** Census of Manufactures, 1957, the Ministry of International Trade & Industry.

*machines has become so popular in shoe-making that they hav* all but supplantd manual work in the process of combining soles and other parts.

## (5) Printing Industry

Printing methods used to be classified broadly into three types—relief printing, lithoprinting and intaglio printing. The astounding advancement of science after the end of World War II has brought about a revolution in the printing industry. Various new printing materials and chemicals have made their debut, and printing techniques have become complicated. Mechanization is also making rapid progress in this industry.

Nowadays there are a variety of materials for printing, and the foregoing printing methods have become insufficient. Special printing fields have been cultivated one after another.

*Development of Printing Industry*

Japan's printing business established itself as an industry in the early part of the Meiji Era, introducing technical knowhow from the United States and European countries. However, printing machines were primitive and inefficient. It was towards the close of the Meiji Era that rotary presses came into use for newspaper printing.

As the nation's cultural standards rose, printing demands roared, and the progress of printing techniques was encouraged. After World War I, the publishing business was animated, the number of printing shops increased, industrial facilities were modernized, and such new printing techniques as offset printing and photogravure were spread.

Entering the Showa Era, popular magazines, juvenile books and other printed matters increased notably, and such commercial print as leaflets, posters and catalogues were popularized. This increase in demands had opened up markets for small and medium printing shops, too.

The outbreak of World War II, however, invited tight controls over printing paper and other materials, consolidating printeries by as much as 70 per cent. Before the consolidation was completed nearly 54 per cent of the facilities were burnt down by war, and the printing industry as a whole was driven into a corner.

After the war, rigid restrictions on printing paper and a shortage materials hindered the rehabilitation of the industry. In 1947 to 1948, the printing industry revived on the strength of a publishing boom, and the number of printing enterprises zoomed to 14,000 units. A reactionary depression following this boom shook the feeble foundations of the publishing business, and new publishers were forced to close up one after another. Printing houses having business relations with these publishers inevitably experienced hard time, and the printing industry

plunged into a consolidation process.

With this as a turning point, larger printeries carried out industrial rationalization and modernization. It was at that time that printing machines and rotary presses for multi-color printing were introduced, and air-condition linotypes, monotypes, electrotype process, etc. were adopted. Small and medium printers were lagging behind these larger ones in industrial and managerial rationalization and modernization. The result was that the markets were narrowed down for small and medium printing houses, and some of them went bankrupt.

Around 1951 and 1952, renovation of printing facilities was started in small and medium enterprises, but there were already signs of facilities becoming excessive. In the face of the marked advance of large printing enterprises, these printeries found orders tapering off gradually. Some of them became unable to pay even wages to their employees, and serious labor problems came to a head. Many of the small and medium printers were subcontracting for larger ones, but they felt the pinch of hard times due to larger printers' arrears of subcontract money payments and cuts in subcontract prices.

Business difficulties resulted in intensifying order-winning competition. And the competition took place not in the phase of printing techniques and services, but in price-cutting.

To check being involved in common ruin as well as to push modernization of facilities, these small and medium enterprises needed to stabilize themselves first. In compliance with the Smaller Enterprises Stabilization Law, they made efforts to form coordination associations throughout the country in 1954. In order to prevent printing shops from unreasonable price-cuttings, coordination associations took the initiative in setting standard prices for printing, and having printing machines registered. In principle, the new installation of printing machines was banned in 1957. In the following year, printing fees were controlled to stop underselling.

In April 1958, when the Smaller Enterprises Organization Law was enacted, coordination associations were changed into industrial associations. Industrial associations were set up in every prefecture and fell under the banner of the Japan Federation of Printing Industrial Associations which is now regulating both industrial facilities and prices.

Generally speaking, small and medium printeries are in straitened circumstances, but along with the expansion of the economy and higher living standards, demands for printing show not spectacular but steady uptrend. Seen from a long-term stand-point of view, it may be predicted, the Japanese printing industry will develop on stable foundations in the future.

*Present Situation*

Printed matters are divided into publications (text-books, periodi-

cals, newspapers, etc.), office stationery (account books, vouchers, etc.), and commercial prints (posters, calendars, advertisements, catalogues, papier-mache ware, etc.). According to a survey conducted by the Printing Industry Association, publications account for 36.7 per cent of the total printing works, commercial prints 30.3 per cent, office stationery 24.6 per cent, and others 8.4 per cent.

One of the noticeable trends is a conspicuous increase in commercial prints. In prewar days, the weight of commercial prints was small, while publications were the main printing work. Another trend is that luxurious printing demands are increasing year after year. In fact, multi-color printing and special printing are on the increase. Textbooks for primary school pupils are printed in color. Special printing even on polyethylene and aluminium boxes has become possible.

*Characteristics of Printing Industry*

One of the major characteristics of the printing industry is that the printing industry is an industry processing brought in materials. The printing industry starts work on clients' orders. It is hard to work out a business planning, and planned production is not simple. Under such circumstances, printing houses are apt to compete with each other so fiercely in winning orders—often more orders than they really need.

Also characteristic of the printing industry are the heavy dependence on manual work and the difficulty of standardization of works. The anastatic printing process, for example, consists of type-picking, typesetting, plate making, printing, finishing, and distribution of types, and counts heavily on manual work. Labels, wrapping papers and papier-mache ware of set designs and publications can be printed on mass-production basis, and printing costs can be lowered. Standardization of works, however, becomes difficult for the printing of odds and ends. This is the most serious deterrence to the industry's modernization efforts.

The developed subcontracts system and existence of skilled temporary workers seem to be another feature of the printing industry. As explained before, printing houses must handle so many different sorts of work, and moreover demands are not constant throughout the year. That is why they avoid excessive investments in printing facilities and try to their operating rates at a uniform level all the year round. Such being the case, the subcontract system has been developed, and skilled workers are employed on a temporary basis.

In the printing industry, there are private printing houses and small-scale printeries in huge numbers. The printing business is typically a smaller industry. So long as the above-mentioned characteristics continue to exist, hordes of small printing shops will coexist with a handful of large printing houses.

Printing demands violently fluctuate seasonally. In Japan, text-book orders concentrate between September and December. Magazines, periodicals and other general publications are rather constant through-

out the year, but June and July are a slack season, and December is a peak due to the printing of the New Year number. Relatively free from seasonal fluctuations in demands are commercial prints. It seems advantageous, therefore, in order to maintain the operation rate at a certain level, to handle commercial prints.

*Scale-wise Composition of Printeries*

The 1957 census of industry revealed that printing enterprises (except for mimeograph) numbered 10,000, 99.8 per cent of which employed not more than 300 printers each. Printing houses employing more than 300 workers numbered a bare 18. Most of the printeries were operating with less than 100 employees. As a matter of fact, 80 per cent of the total belonged to the small or ultra-small category, employing less than 20 persons each. But small and medium enterprises occupy a very important position in the industry, accounting for 91.3 per cent in the number of employees and 84.2 per cent in production value.

**Composition of Printing Houses**

| Scale | No. of houses | No. of employees | Production value (¥1 million) |
|---|---|---|---|
| Less than 3 workers | 3,145 | 7,725 | 2,795 |
| 4— 9 | 5,010 | 48,722 | 23,731 |
| 20— 49 | 1,416 | 41,925 | 27,832 |
| 50— 99 | 393 | 26,215 | 20,705 |
| 100—199 | 109 | 14,866 | 12,665 |
| 200—299 | 19 | 4,634 | 3,976 |
| Over 300 | 18 | 13,585 | 16,916 |
| TOTAL | 10,110 | 157,672 | 108,620 |

**Source:** Census of Industry 1957, Ministry of International Trade and Industry.
**Note:** Mimeographing houses are not included in statistics.

**Members of Industrial Associations and Their Employees**

| Scale | Type-printing | Lithoprinting | Overall | Totall |
|---|---|---|---|---|
| | % | % | % | % |
| Employers | 244 ( 3.2) | 28 ( 2.3) | 3 ( 0.2) | 275 ( 2.7) |
| Employees | | | | |
| 1— 5 | 3,187 (45.2) | 340 (28.5) | 130 (10.5) | 3,657 (38.5) |
| 6— 10 | 1,751 (24.7) | 288 (24.1) | 158 (12.7) | 2,197 (23.1) |
| 11— 20 | 1,187 (16.8) | 305 (25.5) | 262 (21.1) | 1,754 (18.5) |
| 21— 30 | 371 ( 5.3) | 119 (10.0) | 176 (14.2) | 666 ( 7.1) |
| 31— 50 | 223 ( 3.2) | 76 ( 6.4) | 226 (18.2) | 525 ( 5.5) |
| 51—100 | 99 ( 1.4) | 29 ( 2.4) | 197 (15.9) | 325 ( 3.4) |
| 101—200 | 12 ( 0.2) | 9 ( 0.8) | 77 ( 6.2) | 98 ( 1.0) |
| Over 200 | 3 ( 0.1) | 1 ( 0.1) | 13 ( 1.0) | 17 ( 0.2) |
| TOTAL | 7,057 (100) | 1,195 (100) | 1,242 (100) | 9,494 (100) |
| No. of employees | 66,322 (51.3) | 16,741 (12.9) | 46,344 (35.8) | 129,407 (100) |
| Per employer | 9.4 employees | 14.0 | 37.3 | 13.6 |

**Source:** Japan Federation of Printing Industrial Association (as of July 1958).

According to a survey conducted by the Japan Federation of Printing Industrial Associations, 74.3 per cent of its membership are engaged in type-printing, hiring 51.2 per cent of the total employees. In the type-printing business, those printeries with less than 10 hands account for 73.1 per cent of the total. Per printery number of employees is 9.4 persons in an average.

*Printing Facilities*

Just as printing methods can be classified into relief printing, lithoprinting (offset printing) and intaglio printing (photogravure printing), printing machines differ according to these three different methods. Among them, anastatic printing machines are most popular, ranging from super-speed rotary presses capable of printing 150,000 to 200,000 newspaper copies per hour to hand machines printing name cards, postcards or leaflets at a speed of hundreds of pieces per hour.

The Japan Federation of Printing Industrial Associations' survey shows that of the 35,565 printing machines owned by the 9,494 members, 28,942 units or 81.4 per cent are printing presses, and the remaining 6,623 or 18.6 per cent, lithoprinting machines.

In the 10 years after the war's end, the number of printing machines increased sharply, while many obsolete machines and equipment were scrapped. After being used for an average of 10.6 years, printing machines are usually being replaced.

In industrial modernization, great importance is being attached to higher efficiency, greater speed, and color printing. Automatic printing and multi-color printing are the modern trends. The development of special printing machines is also remarkable as materials for printing are expanding to cellophane, vinyl, tin and glass.

The disparity in industrial and technical modernization between larger and smaller enterprises is becoming conspicuous. This tendency will become more and more prominent year after year.

*Printing Techniques*

The notable advancements seen in printing techniques, printing materials and materials for printing have expanded the definition of printing. Printing used to purport to keep cultural achievements on record, but nowadays it has come to have closer bearings on the every day life of the nation.

The relief printing techniques have been making steady progress. In the field of plate making, the advancement of photographic films and popularization of the mass-process have contributed to enhancement of technical standards. Lithoprinting and offset printing are most advanced in Japan. Recently offset printing has come to command worldwide attention, and its use is being extended. Unlike relief printing, this does not necessitate stocks of lead, and can be done with relatively small capital. The application of color films or negatives to plate-making

masks has been fairly under way. By improving printing ink and paper, offset printing will be able to expect further advance.

Photogravure printing is young in history, but its use has been expanded by the appearance of multi-color gravure. The recent noteworthy advancements in gauges, materials and printing techniques have made it possible to print on plastics, packages and metal-foils. It is much easier to select and use proper printing inks for this printing than other types of printing. The progress of electric register control device is contributing a great deal towards offset printing.

## Number of Enterprises Classified By Business Scale, Type

| Classification by No. of Employees | Total | Ratio (%) | Personal Management | Ratio (%) | Company System | Ratio (%) |
|---|---|---|---|---|---|---|
| Total | 405,426 | 100.0 | 295,782 | 100.0 | 109,644 (78,575) | 100.0 (100.0) |
| 1 — 3 | 198,453 | 49.0 | 192,013 | 64.9 | 6,440 (4,833) | 5.8 (6.2) |
| 4 — 9 | 101,921 | 25.1 | 73,201 | 24.8 | 28,720 (21,951) | 26.2 (28.0) |
| 10 — 19 | 58,438 | 14.1 | 24,101 | 8.1 | 34,337 (24,981) | 31.3 (31.8) |
| 20 — 29 | 19,206 | 4.7 | 4,116 | 1.4 | 15,090 (10,716) | 13.8 (13.5) |
| 30 — 49 | 13,332 | 3.3 | 1,703 | 0.6 | 11,629 (8,031) | 10.6 (10.2) |
| 50 — 99 | 8,460 | 2.1 | 539 | 0.2 | 7,921 (5,242) | 7.2 (6.7) |
| 100 — 199 | 3,146 | 0.8 | 93 | 0.0 | 3,053 (1,836) | 2.8 (2.3) |
| 200 — 299 | 981 | 0.2 | 9 | 0.0 | 972 (520) | 0.9 (0.6) |
| 300 — 499 | 645 | 0.2 | 3 | 0.0 | 642 (271) | 0.6 (0.4) |
| 500 — 999 | 411 | 0.1 | y | | y (124) | (0.2) |
| 1,000 — | 433 | 0.1 | x | | y (67) | (0.0) |

(Note) This table is based on the investigation of 140,000 small-medium scale enterprises which the Smaller Enterprise Agency and the Research and Statistics Division of the Ministry of International Trade and Industry picked up on December 31, 1957 by the sampling method to look into their facts between January 1 and December 31 of 1957. This survey purported to shed light on the distinctive features of Japanese small and medium businesses. X and Y imply that the figures were not disclosed for maintenance of business secrets because the number of enterprises was extremely small.

## Scale-wise Number of Employees, Sales Value, Value Added

| | No. of *Regular* Workers (monthly average in year) | Ratio (%) | Sales Value of Manufactured Goods, etc. | Ratio (%) | Value Added | Ratio (%) |
|---|---|---|---|---|---|---|
| | **In thousands** | | **In ¥ 100 mil.** | | **In ¥ 100 mil.** | |
| Total | 5,935 | 100.0 | 95,332 | 100.0 | 30,398 | 100.0 |
| 1 — 3 | 441 | 7.4 | 1,896 | 2.0 | 708 | 2.3 |
| 4 — 9 | 616 | 10.4 | 4,061 | 4.3 | 1,332 | 4.4 |
| 10 — 19 | 749 | 12.6 | 6,602 | 6.9 | 2,036 | 6.7 |
| 20 — 29 | 440 | 7.4 | 4,601 | 4.8 | 1,384 | 4.6 |
| 30 — 49 | 483 | 8.1 | 5,670 | 6.0 | 1,678 | 5.5 |
| 50 — 99 | 550 | 9.3 | 7,809 | 8.2 | 2,308 | 7.6 |
| 100 — 199 | 412 | 7.0 | 6,567 | 6.9 | 2,017 | 6.6 |
| 200 — 299 | 229 | 3.9 | 4,057 | 4.2 | 1,297 | 4.3 |
| 300 — 499 | 235 | 4.0 | 5,162 | 5.4 | 1,633 | 5.4 |
| 500 — 999 | 268 | 4.5 | 6,474 | 6.8 | 2,102 | 6.9 |
| 1,000 — | 1,509 | 25.4 | 42,432 | 44.5 | 13,908 | 45.7 |

(Note) 1. The above is based on the December 31, 1957 survey conducted by the Smaller Enterprise Agency and the Research and Statistics Division of the Ministry of International Trade and Industry.

2. Value Added by Manufacturers = (sales value of manufactured goods + receipts for contract works + receipts for repairs) − (total costs of materials, fuel and electric energy consumed, and of contract works + amount of excise tax included in value of shipments)

3. Sales Value, etc. = the total of sales value of manufactured goods + receipts for contract works + receipts for repairs.

## Classification of Enterprises

## By Business Lines

| | Ratio (All Enterprises) | | | | Ratio of Enterprises with 300 Employees | | | |
|---|---|---|---|---|---|---|---|---|
| | Enterprises (%) | Workers | Sales Value (%) | Value Added (%) | Enterprises (%) | Workers | Sales Value (%) | Value Added (%) |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 99.6 | 66.1 | 43.3 | 42.0 |
| Food and Kindred products | 21.8 | 11.3 | 14.6 | 10.5 | 99.9 | 86.5 | 61.2 | 63.3 |
| Textile mill products | 17.0 | 18.4 | 14.2 | 11.6 | 99.6 | 65.4 | 49.3 | 47.7 |
| Apparel and other finished products made from fabrics and similar materials | 3.6 | 2.6 | 1.3 | 1.3 | 99.9 | 92.8 | 85.9 | 78.5 |
| Lumber and wood products(except furniture) | 12.7 | 6.9 | 4.2 | 4.1 | 99.9 | 96.1 | 91.5 | 89.2 |
| Furniture and fixtures | 5.5 | 2.4 | 0.9 | 1.2 | 100.0 | 96.6 | 94.1 | 94.7 |
| Pulp, paper and allied products | 2.7 | 3.1 | 3.6 | 4.0 | 99.4 | 61.6 | 37.7 | 31.7 |
| Publishing, printing and allied industries | 3.0 | 4.0 | 2.7 | 4.4 | 99.6 | 77.1 | 54.3 | 50.5 |
| Chemical and related industries | 1.8 | 6.3 | 9.8 | 12.0 | 98.1 | 28.3 | 23.2 | 19.3 |
| Products of petroleum and coal | 0.2 | 0.5 | 1.9 | 1.5 | 98.2 | 48.3 | 17.1 | 20.0 |
| Rubber products | 0.3 | 1.5 | 1.4 | 1.7 | 96.2 | 36.3 | 25.1 | 23.2 |
| Leather and leather products | 1.3 | 0.6 | 0.5 | 0.5 | 98.8 | 86.8 | 82.3 | 80.6 |
| Stone, clay and glass products | 5.8 | 5.2 | 3.3 | 5.3 | 99.6 | 74.6 | 42.8 | 37.8 |
| Primary metal industries | 0.8 | 5.5 | 12.1 | 9.7 | 97.1 | 27.7 | 16.0 | 17.1 |
| Non-ferrous metal products | 0.5 | 2.2 | 3.8 | 4.1 | 97.8 | 31.3 | 27.9 | 19.2 |
| Fabricated metal products (except machinery, transportation equipment) | 6.4 | 5.1 | 3.8 | 4.2 | 99.8 | 88.5 | 74.7 | 74.1 |
| Machinery (except electrical machines) | 4.3 | 7.1 | 5.7 | 6.9 | 99.2 | 72.2 | 57.8 | 58.5 |
| Electrical machinery, equipment and supplies | 1.1 | 5.4 | 5.6 | 7.3 | 97.8 | 36.8 | 20.7 | 19.5 |
| Transportation equipment | 2.1 | 6.2 | 7.8 | 6.1 | 98.6 | 37.4 | 17.6 | 26.2 |
| Professional, scientific and controlling instruments, photographic and optical goods, watches and clocks | 0.9 | 1.5 | 0.8 | 1.2 | 99.0 | 64.4 | 52.4 | 51.0 |
| Miscellaneous manufacturing industries | 9.2 | 4.2 | 2.0 | 2.4 | 99.9 | 91.6 | 82.5 | 77.0 |

(Source) Ibid.

## Actual Conditions of Enterprises for Contract Works

### (Their Ratio Against Total)

| | Orderer of Contract Work | | | |
|---|---|---|---|---|
| | Manufacturing Industries (%) | Industry for Contract Works (%) | Wholesalers, Retailers (%) | Makers, Others (%) |
| Total | 75.5 | 24.3 | 36.0 | 64.0 |
| Food and kindred products | 96.9 | 3.1 | 59.0 | 41.0 |
| Textile mill products | 38.2 | 61.8 | 31.5 | 68.5 |
| Apparel and other finished products made from fabrics and similar materials | 40.2 | 59.8 | 59.8 | 40.2 |
| Lumber and wood products (except furniture) | 88.2 | 11.8 | 48.1 | 51.9 |
| Furniture and fixtures | 86.2 | 13.7 | 56.7 | 43.3 |
| Pulp, paper and allied products | 84.3 | 15.7 | 51.9 | 48.1 |
| Publishing, printing and allied industries | 80.5 | 21.7 | 30.6 | 69.4 |
| Chemical and related industries | 95.7 | 4.3 | 20.2 | 79.8 |
| Products of petroleum and coal | 98.0 | 2.0 | 37.5 | 62.5 |
| Rubber products | 79.2 | 20.7 | 37.1 | 62.9 |
| Leather and leather products | 61.2 | 38.8 | 56.1 | 43.9 |
| Stone, clay and glass products | 92.4 | 7.6 | 58.4 | 41.6 |
| Primary metal industries | 89.7 | 10.3 | 15.8 | 84.2 |
| Non-ferrous metal products | 87.0 | 13.0 | 19.6 | 80.4 |
| Fabricated metal products (except machinery, transpotation equipment) | 66.6 | 33.4 | 20.0 | 80.0 |
| Machinery (except electrical machines) | 67.6 | 32.4 | 9.8 | 90.2 |
| Electrical machinery, equipment and supplies | 72.1 | 27.9 | 8.8 | 91.2 |
| Transportation equipment | 69.9 | 30.1 | 9.2 | 90.8 |
| Professional, scientific and controlling instruments, photographic and optical goods, watches and clocks | 70.6 | 29.4 | 22.0 | 78.0 |
| Miscellaneous manufacturing industries | 79.4 | 20.6 | 52.5 | 47.5 |

(Source) Ibid.

## Enterprises Classified by Business Scale, Loan Source

| Loan Sourse \ Scale by No. of Workers | 1 to 19 | 20 to 99 | 100 to 299 | Over 300 | Total |
|---|---|---|---|---|---|
| Total | 180, 297 | 36, 820 | 3, 914 | 1, 440 | 222, 571 |
| City Banks | 16, 170 | 11, 294 | 2, 473 | 1, 331 | 33, 654 |
| Local Banks | 50, 432 | 16, 217 | 1, 896 | 837 | 69, 382 |
| Mutual Loans and Saving Banks | 25, 166 | 8, 804 | 736 | 136 | 46, 045 |
| Long Term Credit Banks and Trust Banks | 2, 225 | 1, 078 | 386 | 525 | 4, 209 |
| The Central Bank for Commercial and Industrial Cooperatives | 6, 657 | 2, 784 | 536 | 100 | 11, 170 |
| Credit Associations | 38, 576 | 7, 602 | 654 | 78 | 48, 697 |
| Credit Cooperative Associations | 15, 044 | 2, 639 | 166 | 24 | 22, 251 |
| The People's Finance Corporation | 46, 741 | 9, 234 | 255 | 50 | 56, 280 |
| The Small Business Finance Corporation | 11, 222 | 7, 972 | 1, 472 | 161 | 20, 827 |
| The Japan Development Bank | 330 | 139 | 83 | 157 | 719 |
| Business partners | 22, 107 | 3, 988 | 692 | 8 | 26, 643 |
| Money-lenders | 4, 301 | 602 | 30 | 21 | 4, 941 |
| Relatives, friends | 51, 924 | 8, 051 | 316 | 21 | 60, 312 |
| Others | 21, 992 | 6, 037 | 996 | 614 | 29, 639 |

(Source) Ibid.

(Note) 1. City banks …… The Mitsui Bank, the Dai-ichi Bank, the Mitsubishi Bank, the Sumitomo Bank, the Sanwa Bank, the Daiwa Bank, the Tokai Bank, the Bank of Kobe, the Kyowa Bank, the Kangyo Bank, the Hokkaido Colonial Bank and the Bank of Tokyo (which was formed under the Foreign Exchage Bank Law)

2. Local Banks … The ordinary banks excluding the long term credit bank, city banks and trust banks.

## Composition of Workers

### By Age

| Scale by No. of Workers | Total | Under 18 | 18 to 55 | Over 55 |
|---|---|---|---|---|
| Total | 100.0 | 10.2 | 86.2 | 3.6 |
| 1 — 19 | 100.0 | 9.6 | 84.8 | 5.6 |
| 20 — 99 | 100.0 | 12.1 | 83.1 | 4.8 |
| 100 — 299 | 100.0 | 13.4 | 82.6 | 4.0 |
| Over 300 | 100.0 | 6.4 | 92.5 | 1.1 |

## Composition of Workers

### By Length of Service

| Scale by No. of Workers | Total | Under 6 mos. | 6 mos. to 1 yr. | 1 to 3 yrs. | 3 to 5 yrs. | 5 to 10 yrs. | Over 10 yrs. |
|---|---|---|---|---|---|---|---|
| Total | 100.0 | 7.5 | 14.4 | 24.1 | 17.1 | 21.1 | 15.8 |
| 1 — 3 | 100.0 | 8.2 | 14.3 | 34.6 | 18.4 | 16.3 | 7.7 |
| 4 — 9 | 100.0 | 8.9 | 14.7 | 29.4 | 21.0 | 17.6 | 8.4 |
| 10 — 19 | 100.0 | 10.0 | 15.4 | 28.5 | 20.4 | 17.8 | 7.9 |
| 20 — 29 | 100.0 | 10.1 | 16.1 | 28.7 | 19.0 | 18.6 | 7.5 |
| 30 — 49 | 100.0 | 9.9 | 16.6 | 28.9 | 18.6 | 18.2 | 7.8 |
| 50 — 99 | 100.0 | 9.8 | 17.5 | 28.1 | 17.9 | 18.7 | 8.0 |
| 100 — 199 | 100.0 | 8.9 | 17.0 | 27.2 | 17.8 | 19.8 | 9.3 |
| 200 — 299 | 100.0 | 8.3 | 16.5 | 26.2 | 17.0 | 20.6 | 11.4 |
| 300 — 499 | 100.0 | 7.6 | 15.9 | 24.5 | 17.0 | 21.2 | 13.8 |
| 500 — 999 | 100.0 | 5.6 | 14.1 | 22.2 | 17.0 | 23.9 | 17.2 |
| Over 1,000 | 100.0 | 3.4 | 10.2 | 14.1 | 12.6 | 26.8 | 32.9 |


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