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SMALL-SCALE INDUSTRIES OF JAPAN

THE ELECTRIC LAMP INDUSTRY

By

TEIJIRO UYEDA

AND

TOSUKE INOKUCHI

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THE ELECTRIC LAMP INDUSTRY

No thorough-going survey of any kind has yet been made of the electric lamp manufacturing industry in Japan. The available materials for the study of this industry, especially for the smaller scale factories, are therefore very meagre. Furthermore, the highly complicated organization in this industry adds to the difficulty of making a comprehensive detailed examination of the whole field of this industry. We are, therefore, given no choice except to confine our endeavours to indicating merely the bare outlines and tendencies of the industry.

CHAPTER I

INTRODUCTION

THE first electric lamp manufacturing company in Japan, "Hakunetsu-sha," was established in 1890 in Tokyo with a capital of ¥50,000. In those days, however, almost the entire demand in Japan for the electric lamps was met by the imports from Germany.

Later, in 1905, the General Electric Company in America, which was seeking a new market in the Far East, absorbed the above-mentioned establishment as its initial step in organizing a new company, the Tokyo Electric Company, Ltd., (Mazda Lamp). The next year it succeeded in placing the Osaka Electric Lamp Co. under its control. Thus it made its debut in the lamp manufacturing field of this country with its large capital and superior technique, and on the other hand, gave an impetus to the electric lamp industry in Japan. But prior to the War the demand remained amply covered by the German made lamps. With the outbreak of the War, the imports from Germany ceased completely, and consequently it caused a sudden increase in the demand for home-made articles. At the same time, orders from abroad, especially from Russia, poured into this country. Our electric lamp manufacturing industry has since made rapid strides. The factory of the Tokyo Electric Co. was enlarged and brought up-to-date, while on the other hand, many manufacturers began to

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make so-called " home-made " electric lamps. (The term " home-made " is generally not applied to the manufactures of the Tokyo Electric Co. which is chiefly controlled by the capital of the General Electric Co.)

The Tokyo Electric Co. accumulated enormous profits, increasing its capital continually in the course of the war boom, and when the post-war depression came on, it seized this opportunity for further amalgamating many other electric lamp manufacturing companies under its own control. It is now a solid existence with a capital of ¥39,500,000 and assets of about ¥130,000,000, and commands a superior position in this branch of Japanese industry, having extraordinary influence upon a vast number of affiliated or subsidiary companies. At the same time, the increase in the demand of this country and the swelling of the export trade afforded a chance for the " home-made " lamp manufacturers to make notable progress. Their progress was especially remarkable after the General Electric Company's patent on the tungsten filament expired in 1927. And since the re-imposition of the gold embargo in 1931, the volume of electric lamps exported increased so rapidly that it attracted world-wide attention. At present they are one of the principal exports of Japan.

TABLE 1

RECENT EXPORTS OF JAPANESE ELECTRIC LAMPS

Year	Total		Miniature Lamps				House Lamps and Others	
			For Decoration		For Automobiles and Others			
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
	gross	yen	gross	yen	gross	yen	gross	yen
1928	460,475	4,532,561	—	—	—	—	—	—
1929	671,938	5,399,977	—	—	—	—	—	—
1930	705,527	5,316,098	—	—	—	—	—	—
1931	1,051,895	5,874,996	—	—	—	—	—	—
1932	1,898,995	10,187,497	—	—	—	—	—	—
1933	1,891,842	10,167,105	—	—	—	—	—	—
1934	1,572,076	8,942,058	359,609	1,559,750	729,499	1,874,403	482,968	5,507,905
1935	1,346,954	7,636,552	407,522	2,185,024	655,539	1,840,286	283,893	3,611,242

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CHAPTER II

MAIN GROUPS OF MANUFACTURERS

The electric lamp manufacturing industry in Japan can be divided in two groups : the Tokyo Electric Co. and the so-called " home-made " electric lamps manufacturers which include all the manufacturers of electric lamps except the former. The latter is further sub-divided into two groups, namely, the " standard " electric lamp manufacturing companies (large-scale) and the small-scale manufacturers, so-called " town " manufacturers.

1. The Tokyo Electric Co., Ltd.

The Tokyo Electric Co., with its numerous patents and highly mechanized up-to-date factories, manufactures all the necessary materials for making the complete lamps within its own factories. In other words, it carries on its manufacturing on a self-sufficient scale. It has, moreover, a modern laboratory where the manufactures are being constantly improved, and hence its lamps excel the other " home-made " articles in quality. It manufactures high quality articles such as high class house lamps, Röntgen tubes, radio vacuum tubes, etc.

By agreement with the General Electric Company of N.Y., the Tokyo Electric Co. does not export its manufactures to overseas markets, except Manchoukuo, China, and the South Sea countries. Its manufactures are mainly sold to the electric lighting companies and the government offices in Japan.

2. " Home-made " Electric Lamp Manufacturers

The capital of the " home-made " lamp manufacturers is generally small. They have no self-sufficient equipment. Processes of manufacturing are divided among different factories, all of which are absolutely independent of each other, and with their own capital.

" Standard " Electric Lamp Companies

Of the " home-made " electric lamp manufacturers, eleven large companies are generally known as the " standard " electric lamp companies (their combined capital amounts to ¥8,280,000). They have organized a cartel by themselves, and each company manu-

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factures standardized articles in accordance with a given specification adopted by the cartel. Hence, the appellation "standard" companies.

The "home-made" electric lamp manufacturing, especially the "standard" lamp manufacturing, has, as above mentioned, made remarkable progress following the expiration of the patent held by the General Electric Co. on the tungsten filament. The factories of "standard" companies have now been mechanized to a great extent, and the method of production has been highly improved, so much so that we meet with such statements as follows:

> "From the technical standpoint, although the buildings are of wood and modest in appearance, the factory is well organized and the conditions of work of its 223 workers (50 men and 173 women) are equal to Western conditions." F. Maurette, Social Aspects of Industrial Development in Japan, 1934, p. 17.

Their main product is the house lamp, but some of them are already manufacturing higher grade articles, such as radio vacuum tubes, etc. The market for these "standard" electric lamps is mainly in Japan proper. The greater percentage of this home demand is from electric lighting companies, government offices, and large business houses. Therefore, the competition with the Tokyo Electric Co. is really very keen.

"Town" Electric Lamp Manufacturers

By "town" lamp manufacturers, we mean the manufacturers with small-scale factories or workshops, scattered in the labourers' resident quarters of large industrial towns. The equipment in them is still in a very primitive stage, falling far behind the above mentioned two groups of manufacturers in the matter of mechanization. The Tokyo Electric Co. and many of the "standard" companies carry on their whole process of production by a series of automatic machines, while in the case of the small-scale "town" manufacturers only some processes are carried on by second-hand machines and the rest entirely by hand. They have, of course, no laboratories, and in extreme cases, there are often some manufacturers who have no equipment for conditioning the manufactured lamps. They are engaged in their manufacturing, depending solely on their own experience, so that it is natural that their

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manufactures should lack uniformity and often be found to be of inferior quality.

Of late years, they have manufactured articles almost solely for overseas markets, though some of them are engaged in manufacturing for the home market. The comparatively excellent small-scale factories receive orders directly from electric lighting companies, but they usually make it their main business to sell their goods to merchants. Due to the rapid increase in the demand for ornamental lamps for temporary use, a considerable number of these cheap electric lamps made by small manufacturers have lately appeared in great quantities on the market.

The manufactures of these small factories are chiefly miniature lamps such as flash light bulbs, automobile light bulbs, and decoration lamps for Christmas use. Thus the kinds of products produced by the small scale "town" manufacturers and the large companies are different from each other.

The Tokyo Electric Company manufactures all the materials and parts, such as bulbs, leading wires, bases, filaments, paper boxes, and other chemicals in its own factories. The "home-made" manufacturers, however, both most of the "standard" companies and small-scale manufacturers, buy all these parts which are manufactured in other factories.

The number of materials and parts manufacturing factories in Tokyo is as follows:

	Number of Factories	Number of Workers	The Percentage of Female Workers
Bulb-Glass Manufacturing Factories	25	1,800	25%
Base Manufacturing Factories	20	400	30%
Filament Manufacturing Factories	4	300	60%
Leading Wires Manufacturing Factories	7	200	95%
Wooden Boxes and Paper Boxes Manufacturing Factories	23	600	...

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CHAPTER III

MAIN FEATURES OF SMALL-SCALE MANUFACTURING

The most important part in the electric lamp manufacturing industry in Japan is the small factories and workshops. These together manufacture by far the greater part of the whole amount of lamps exported. Though, as we have already observed, the factories of the Tokyo Electric Company and the "standard" lamp companies are equal to any factory in Europe or America, the conditions of the small factories and workshops, which form the very basis of the recent rapid increase of the exports, are by no means satisfactory. Let us now examine the conditions of these small-scale factories and workshops.

There are two types of "town" electric lamps manufacturers. Some manufacturers carry on their work in their own homes, while the other do it under the factory system, even though their scale is very small. The former had its origin before the Great War, when some persons began manufacturing miniature lamps as a by-occupation and it has since been growing more and more prosperous till it has become what it is to-day. Nevertheless, it is still lingering in the manual work stage. The latter kind of manufacturers, called "town factory" for the purpose of distinguishing it from the large-scale factory, appeared after the War, and has made rapid progress since the termination of the General Electric Company's patent on tungsten filaments. At first their chief business was to meet the home consumption, but with the recent growth of the demand from abroad one manufacturer after another has changed his business to manufacturing for export purposes.

Most of the small "town" electric lamp manufacturers are skilled labourers thrown out of their work by the introduction of the automatic machines into the factories of the Tokyo Electric Company and the other large "standard" manufacturing companies during the war boom. Those small-scale factories and workshops, therefore, have sprung up mainly in the south-western part of the city of Tokyo, which is the section where most of the factory labourers of the above mentioned electric lamp companies reside. Already before the war, there had existed a number of

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factories in this part of the city as so-called "outside" factories of the Tokyo Electric Company, and been engaged in the manufacture of raw materials and parts of electric lamps. After the Great War, the Tokyo Electric Company completed its program of self-supply of materials, and as a result thereof these small factories lost their connections with the Tokyo Electric Company. They, therefore, began to change their business to supplying materials and parts to the small manufacturers who were just beginning to spring up at that time. Thus this section of the city came to be an electric lamp manufacturing quarter, including every branch of lamp manufacturing.

Since then, this electric lamp manufacturing quarter of the city has always been prosperous, with the advantages of abundant cheap labour, a convenient supply of gas, and its proximity to Yokohama. And now more than 90% of the electric lamps for export purposes are manufactured in this quarter. Besides Tokyo, a few small "town" electric lamp manufacturers for export purposes are to be found in Osaka, and of late years in Korea.

These small manufacturers produce only the small-sized lamps, such as fancy bulbs, flash bulbs, automobile lamps, etc. and do not manufacture the house lamps, except for a few of the comparatively larger and excellent factories. The bulbs for decoration and automobiles are chiefly produced in the "town factories," and a large number of family-scale manufacturers are generally engaged in making miniature lamps such as flash bulbs and miniature fancy bulbs, etc.

In the matter of equipment and of technique, these "town factories" or small workshops are much inferior to the large factories. The process of flash bulbs manufacture is especially so simple that there is naturally no machine in the process, and not a few of them are manufacturing lamps by hand with only one gas burner in their own homes.

The most prominant functionary or pivot of the small-scale "town" electric lamp manufacturing system is the middleman or merchant employer. The small-scale "town factories" or family-scale workshops are in fact nothing but the factories under the direct or indirect control of these merchants. The merchants, accepting orders from the exporters in Yokohama, buy the materials from the material manufacturers. Then, they put out the materials to these small factories or workshops, and let them

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manufacture the articles. When the articles are completed they are again collected by the merchants and sent to the exporters.

The relationship between the merchant employers and these small "town" manufacturers is sometimes nothing but that of buyer and seller, but usually the latter may be called mere out-workers who receive piece-wages for working for the former. Small "town" manufacturers very often get advances from the merchants, and thus sink themselves under the control of the latter. Some of them are entirely dependent on the merchant, who provides those manufacturers with factories, machines, materials, labourers' wages, and their own living expenses.

Of late years, there has been a tendency among the comparatively large "town factories" to come into direct contact with the exporters, discarding the intermediate merchants. But these factories do not have enough productive capacity to meet the orders with their own equipment, and hence orders are again put out to the smaller manufacturers around them. And in this case we cannot deny that these factories are to some extent under the financial control of the exporters.

The relation between the family-scale flash bulb manufacturers and the merchant employers is much more intimate. They are financially as well as morally under the control of the merchant, often borrowing money from the latter in case of birth, death, and illness, etc.

No dependable survey as to the number of these small-scale "town" manufacturers has yet been made. In fact, their rise and fall, moving and changing, are so frequent that it is almost impossible to know the precise total number at any given time. It is said, however, that the number of "town factories" with 5 or more workers is about 300 and their workers about 6,000–7,000. Female workers occupy 50–60% of this total. Most of the small-scale "town factories" employ less than 30 workers, and the factories with less than 15 workers occupy 50% of the total number of factories. If we add to this the number of factories with 15–29 workers, the percentage will rise as high as 90% (Table 2). If we classify the factories according to the respective amounts of their capital, the number of factories with a capital of less than ¥1,000 occupies 22% of the total, including all the larger factories. The percentage rises to 42%, if we add the number of factories with capitals of less than ¥5,000 (Table 3).

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TABLE 2

NUMBERS OF FACTORIES AND WORKERS CLASSIFIED ACCORDING TO NUMBER OF WORKERS EMPLOYED, 1928–1933

Factory Classes according to Number of Workers Employed		1928	1929	1930	1931	1932	1933	1932 (A)
5–9 Workers	(a) Number of Factories	32	40	38	52	77	87	63
	(b) Workers	220	243	251	340	518	536	401(101)
	(c) of which women	97	107	90	120	185	206	158 (40)
10–14	(a)	13	16	26	31	84	83	62
	(b)	170	192	300	344	1,026	948	731(130)
	(c)	54	74	126	135	405	372	316 (52)
15–29	(a)	25	22	34	50	83	83	91
	(b)	496	452	688	1,000	1,570	1,626	1,770(158)
	(c)	266	225	335	494	725	740	851 (70)
30–49	(a)	15	12	16	16	28	30	42
	(b)	542	467	654	633	1,086	1,129	1,575 (61)
	(c)	292	229	355	360	572	647	734 (27)
50–99	(a)	9	13	9	10	19	15	23
	(b)	672	977	643	712	1,405	1,006	1,445 (7)
	(c)	379	521	404	391	847	622	748 (3)
Total: 5 and under 100 workers	(a)	94	103	123	159	291	298	281
	(b)	2,100	2,093	2,536	3,029	5,605	5,245	5,922(457)
	(c)	1,088	1,156	1,310	1,500	2,734	2,587	2,807(192)
100–499	(a)	10	6	4	6	9	11	* 16
	(b)	1,600	1,056	601	919	1,300	1,523	4,521 (2)
	(c)	898	738	417	603	767	1,027	2,167 (—)
500 and over	(a)	1	1	1	1	1	1	included
	(b)	1,355	1,405	1,622	1,828	2,218	2,947	in *
	(c)	573	551	716	856	1,002	1,295	
TOTAL	(a)	105	110	128	166	301	310	297
	(b)	5,055	4,792	4,759	5,776	9,123	9,715	10,443(459)
	(c)	2,559	2,445	2,443	2,959	4,503	4,909	4,974(192)

Notes: Based on the Ministry of Commerce & Industry's "Factory Statistics", and (A) calculated from the Ministry of Commerce & Industry's "Survey on Actual Conditions of Industries—Electric Lamp."

1. "Factory Statistics" involves factories with 5 and more workers, and so it shows fairly well the development of the group of "Town Factories" if we exclude factories with 100 & more workers, which are entirely "Standard" or "Tokyo Electric" factories. (See: Total, 5 & under 100 workers)
2. (A) Column involves factories with 3 & more workers. Figures in parentheses show family workers.

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TABLE 3

NUMBER OF FACTORIES CLASSIFIED ACCORDING TO CAPITAL AMOUNTS, 1932

Factory Classes according to Capital Amounts	Under ¥500	¥500 & under ¥1,000	¥1,000 & under ¥2,000	¥2,000 & under ¥3,000	¥3,000 & under ¥5,000	¥5,000 & under ¥10,000	¥10,000 & under ¥30,000	¥30,000 & upwards
Number	25	40	68	33	26	34	36	35
Percentage of Total Number	8.4%	13.5%	22.9%	11.1%	8.8%	11.4%	12.1%	11.8%

The foregoing figures are of the "town factories" with 5 or more workers. But, as mentioned above, there are numerous family-scale manufacturers engaged in miniature lamp manufacturing. Most of them have no capital, nor equipment of any notable kind; so that it is more impossible to calculate their precise number. The estimated number of family-scale workshops, however, is about 1,500 in Tokyo alone. According to estimations of the Tokyo Electric Lamp Manufacturers' Association for Export, the number of their workers was as much as about 5,500 in 1932. These family-scale manufacturers are sub-divided into two kinds: (a) small workshops with the family members (husband, wife and children and sometimes employing one or two living-in workers besides the family), (b) manufacturing carried on by only a single person or two as a by-occupation in addition to their principal occupation.

According to the calculations of the Tokyo Electric Lamps Manufacturers' Association, the output of the electric lamps of the small-scale "town factories" in 1932 amounted to 93,500,000 pieces (mainly bulbs for decoration and automobiles), and that of the family-scale manufacturers to 160,000,000 pieces (miniature lamps, such as flash bulbs and miniature fancy bulbs for Christmas decoration).

CHAPTER IV

BUSINESS CONDITIONS OF SMALL-SCALE MANUFACTURERS

The "town" or small-scale electric lamp manufacturing industry owes its existence almost entirely to the export trade; and the

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fluctuations in the export trade quickly affect its business conditions. Since the re-imposition of the gold embargo in December of 1931, the export of electric lamps has increased enormously and, therefore, new "town factories" were established in vast numbers (See : Table 2). Far more noteworthy was the increase in the number of family-scale or household manufacturers.

Such a sudden, unsound increase in the number of small manufacturers naturally brought about a state of keen competition among themselves, and resulted in the abnormal cutting down of electric lamp prices. During the winter months of each year, from November to February, export of electric lamps is usually very dull. In this period small manufacturers are usually compelled to make drastic efforts to secure whatever order they can possibly get, and the inevitable result is the extremely low price of their manufacturers. Under conditions of keen competition the price, once lowered, can not easily be raised to the earlier level, and accordingly, the price has become lower and lower as shown in the following table.

TABLE 4

INDEX NUMBER OF THE AVERAGE EXPORT PRICE OF ELECTRIC LAMPS

(1929=100)

Year	1929	1930	1931	1932	1933	1934	1935
Index . . .	100.0	93.7	69.5	66.9	65.8	62.8	70.3

Note: Based on "Monthly Return of The Foreign Trade of Japan."

For instance, the price of flash bulbs, which occupy the major portion of electric lamps exported, dropped from 5.0—5.6 sen to 1.0—1.1 sen per piece in the course of five years, 1930—1934. During the same period the price of house lamps was reduced by 40–50%, the wholesale price of ordinary "town" house lamps of 100 v. being now as low as 6 sen, that of gas-lamps about 8–10 sen ; all of them about one third of the prices of the same kind of manufactures produced by the Tokyo Electric Company.

Such reduction in the price is partly due to the marked improvement of technique and the increased efficiency coming from the

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mechanization of factories, but the chief factor was the rapid and unreasonable increase in the number of small manufacturers and their cut-throat competition. Small-scale lamp manufacturing can be started with an extremely small capital, or sometimes with practically none at all, for the merchant employers will advance the necessary funds. And the requisite knowledge and technique for opening a small workshop is also quite so simple that it may be easily acquired in a very short time. In the case of flash bulbs, as mentioned in foregoing chapter, they can be manufactured with no other equipment and technique than a single gas burner in their own kitchen. Hence, whenever business shows any slight sign of prosperity, there soon arise the abnormal increase of small workshops and accordingly extreme over-producton, which inevitably cuts down the price so much as to cause trouble for the Japan-made electric lamps in some overseas markets. Such abuses have been eliminated to some extent during the recent years by the controlling measures which shall be described later.

Let us now examine the business conditions of these small manufacturers, especially under the conditions of cut-throat competition. It is a very difficult task to analyse their business conditions precisely as most of them do not keep books. In 1932, the Ministry of Commerce and Industry made a general survey of the actual conditions of the electric lamp manufacturing industry in Japan. Its results are shown in Table 5, indicating the items of production costs, the annual income, and the balance between profit and loss in various factories classified according to the number of workers therein (See : Page 15).

Judging from the results, the smaller workshops may apparently seem to be the more profitable, but the item " expenditure " in this table does not include labour costs or living expenses of family workers. The " profit " in this table is, therefore, not a profit in a strict sense of the word, as it includes the living expenses of the workshop-owner and his family. Taking this fact into consideration, the so-called " profit " in small workshops barely covers the owners minimum living expenses. Consequently, in most cases, a " town " lamp manufacturing factory or workshop is by no means a profit-seeking capitalistic enterprise, but an occupation for earning the bare necessities of household living expenses.

The foregoing depicts the conditions of this manufacturing industry somewhere about 1932, when trade was still going up-

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TABLE 5

CLASSIFICATION OF AVERAGE INCOME, EXPENDITURE & PROFIT PER FACTORY, 1932

Factory Classes according to Number of Workers	Number of Factory	(A) Income	(B) Expenditure	Percentages of Total Expenditure								(C) Profit (A–B)	Profit-rate $\left(\frac{C}{B}\right)$
				Raw Material	Light & Power	Wage	Taxes	Repairing & Depreciation	Rent	Pay for Outside Piece-workers	Others		
		yen	yen	%	%	%	%	%	%	%	%	yen	%
Family Scale	4	1,449	844	71.1	16.3	1.8	0.4	0.9	—	2.2	7.3	605	71.7
3– 5 Workers	5	4,485	3,943	51.7	5.4	22.5	0.5	1.0	—	12.9	6.0	548	13.9
5– 6 „	21	5,611	5,024	54.0	7.0	18.7	0.6	3.1	2.0	6.2	8.4	587	11.7
7– 9 „	33	6,645	5,674	54.4	7.2	27.1	0.8	3.0	0.5	1.1	5.9	971	17.1
10–14 „	62	12,192	10,975	63.9	5.9	24.3	0.5	1.1	0.2	0.8	3.3	1,217	11.1
15–29 „	91	21,213	19,555	61.4	5.9	23.6	0.5	1.5	0.4	2.6	4.1	1,658	8.5
30–49 „	42	55,330	52,149	58.3	6.0	20.1	0.3	1.6	0.4	3.6	9.7	3,181	6.1
50–99 „	23	138,460	129,592	57.0	5.5	19.9	0.4	4.1	1.8	1.7	9.6	8,668	6.8
100 & upwards	16	221,424	216,859	66.3	2.5	8.6	0.2	0.8	2.9	9.0	9.7	4,565	2.1

Note: Based on the Ministry of Commerce & Industry: "Survey on Actual Conditions of Industries—Electric Lamp."

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wards. In 1933 when the export of electric lamps came to a standstill, the competition among the manufacturers grew keener, and all the small manufacturers found themselves in extreme difficulties with very little prospect for improvement. It is interesting, however, to notice the fact that most of the factories closed down were chiefly middle-scale "town factories," especially the bulb-glass manufacturing plants with comparatively large fixed capital. Very few of the small-scale and family-scale workshops actually went out of business, for the greater number of them were able to tide themselves over the difficult straits by reducing wages and living expenses to an utmost minimum. The strong competitive power of small manufacturers in times of business depression is indeed a matter of amazement, and their elasticity, flexibility, and adaptability to changing conditions is far beyond any ideas which we might entertain.

In short, the "town" electric lamp manufacturing, whether in a "town factory" or family-scale workshop, is far from being a modern capitalistic enterprise seeking capitalistic profit, but a mere occupation for earning minimum family living expenses. Consequently, the small manufacturers are compelled to indulge in reducing their elastic living expenses to the utmost minimum sum so long as they do not wish to change their calling. This is the chief reason why they are able to make and, sometimes, increase their "profit" even in times of serious depression. The continu-

TABLE 6

COST OF ELECTRIC LAMPS, 1932

(House lamp, 120 V. 60 W. per 100 Pieces)

	TOTAL	Raw Materials						Over-head Charges				Others			
		Total	Bulb-Glass	Filaments	Base	Leading Wires	Others	Total	Wage	Electric Light & Power	Depreciation	Total	Packing	Freight	Selling Expenses
Value (sen)	528	329	120	65	60	64	20	113	27	70	16	8.6	5.8	0.5	23
%	100	63.0	23.0	12.4	11.5	12.3	3.8	21.6	5.2	13.4	3.0	15.6	11.1	0.1	4.4

Note: Based on calculations made by the Tokyo Electric Lamp Manufacturer's Association for Export.

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ous reduction of the price of lamps, which has again begun to rise since 1935 owing to the controlling measures, are also to be explained from this characteristic nature of small manufacturers.

The components of the electric lamp price are as set forth in Table 6 above.

CHAPTER V

CONDITIONS OF LABOURERS

Perhaps clever readers may have already seen through the mass details to the working conditions of labourers engaged in these small-scale factories or workshops. The conditions of workers in the "town" electric lamp manufacturing industry, we fear, represent the darkest side of the Japanese industrial labour situation.

The conditions of the workers in small factories or workshops are quite different from those in an up-to-date, modern factory. As regards the family-scale workshops, the workers are usually family members and even the non-family workers live in the employers' houses and are treated like family members. Also in the "town factories," which are more or less under the factory system, the interests of workers seldom come into conflict with those of their employers, contrary to the usual case in larger factories. They stand generally in the same position with their employers against the merchant employers. Under such circumstances, depression always forces the workers to lower the standard of their own living, rather than threatening them in the form of unemployment. The reasons are as follows :

Owing to the lack of organization among the numerous small manufacturers and their extremely weak position against the merchants, they can not raise the prices of their products by means of regulating their volume of production. On the contrary, they always strive, competing against each other, to increase their production amounts in order to make up for the diminished income due to the lowered price of their manufactures. With this end in view, those small manufacturers, whose technical level is exceedingly low, have no other means than resorting to lengthening their labour hours and lowering the workers' wages or their own standard of living. In such cases, the workers instead of strug-

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gling against their employers, are obliged to acquiesce to the lowering of their own wages and consequently of their standard of living in order to maintain their livelihood. A typical instance of it was seen at the time of the depression in 1934, when about 1,200 workers engaged in bulb-glass manufacturing were faced with unemployment. The labour union at that time, instead of going on strike, proposed a lowering of the wages of its own accord.

The workers in the "town" electric lamp manufacturing industry come into the trade generally through family connections or through personal acquaintances. Their educational standard is usually low. In the Tokyo Electric Company and the "standard" companies, most of the workers are graduates of Senior Primary Schools (eight year course), while the workers in smaller factories are usually graduates of the ordinary Primary School (six year course). Female workers have greatly increased of late years ; and their percentage of the total is as high as 50%. The ages of the workers chiefly fall between 15 and 19 years, amounting to 50% of all the workers (Table 7). In family-scale manufacturing of flash bulbs, the number of Korean workers has recently begun to increase more and more on account of the cheapness of their labour.

TABLE 7

AGE OF WORKERS IN ELECTRIC LAMP FACTORIES
TOKYO, 1933

Age (years)		11–14	15–19	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60 & over
		%	%	%	%	%	%	%	%	%	%	%
Percentages of Total Numbers	M.	12.9	43.2	21.6	10.3	7.1	2.1	1.5	1.0	0.6	0.4	0.2
	F.	19.3	53.9	19.1	3.9	1.8	1.1	0.6	0.4	0.1	0.1	—

Note: Taken from "Actual Statistical Survey of Labour, Tokyo City", which involves only factories with 30 & upwards of workers.

The working hours in small-scale factories are usually longer than in the larger ones. In the Tokyo Electric Company and other "standard" factories an eight or nine hour system is adopted. The usual practice in "town factories" is to employ a ten hour system, and the first and third Sundays in every month are the holidays. The working hours in family-scale manufacturing are extremely irregular, and therefore has an amazing elasticity according to changing conditions.

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In the "town factories" the form of wages differs among various factories. It is, however, a common practice, to apply both a time-wage and piece-wage, side by side. In most of the "standard" factories and in the Tokyo Electric Company, they usually apply the time-wage system. The average daily earnings per worker are as follows.

TABLE 8

DAILY WAGES PER WORKER IN VARIOUS TYPES OF FACTORIES

		"Town" Factory	"Standard" Factory	Tokyo Electric Company
Male	Apprentice	35– 40 sen	55– 65 sen	Kawasaki Factory *Average of all the Workers*—106 sen.
	Ordinary Labourer	70–100 sen	80–120 sen	
	Skilled Labourer	110–130 sen	130–150 sen (Maximum 300 sen)	Himeji Factory Male Labourers *Averaged*—86 sen Female Labourers *Averaged*—56 sen
Female	Apprentice	30– 40 sen	40– 50 sen	
	Skilled Labourer	70– 90 sen	80–100 sen (Maximum 140 sen)	

The earnings classified according to the scale of factories are shown in Table 9.

TABLE 9

AVERAGE ANNUAL EARNINGS PER WORKER, 1932

Factory Classes according to Number of Workers	3–4 Workers	5–6	7–9	10–14	15–29	30–49	50–99
Yen	276.9	231.7	242.4	270.8	256.4	287.7	368.4

The workers in the family-scale manufacturing of flash bulbs generally receive piece-wages for their labour. An ordinary family worker receives 60–70 sen per 1,000 pieces of flash bulbs from the merchant employer, and a skilled worker who manufactures 1,500 pieces a day, earns 120–130 sen. Living-in apprentices are given pocket-money of between five and seven yen a month.

The above are the wages of the last two years, 1934 and 1935.

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Compared with those of 1929, the wages of the skilled workers in the "standard" factories have fallen from 250–300 sen to 130–150 sen per day, and those of the family manufacturers of 15 m.m. flash bulbs from 4 sen to 0.95 sen per piece. Table 10 shows the index numbers of wages and the working hours in the "town" factories in Tokyo.

TABLE 10

INDEX NUMBERS OF LABOUR HOURS AND WAGES

(Tokyo)

Year	Aggregates, whole year			Per Worker		Per Labour hour
	Labour hours (A)	Wages (B)	Average Number of Workers (C)	Labour hours $\left(\frac{A}{C}\right)$	Wages $\left(\frac{B}{C}\right)$	Wage $\left(\frac{B}{A}\right)$
1929	100.0	100.0	100.0	100.0	100.0	100.0
1930	101.3	52.6	93.5	108.3	56.3	51.9
1931	113.2	49.8	125.7	90.1	39.6	44.0
1932	219.8	74.7	224.3	98.0	33.3	34.0
1933	230.1	73.1	222.8	103.3	32.8	31.8

Note: Taken from "Factory Statistics."

These "town" factories seldom pay extra allowances for night work, and very few of them have anything like a retiring allowance system. Only a few excellent "town" factories have an arrangement for their workers to lay aside part of their wages, so that they may be paid back when they retire, with an addition of a special bonus in case of regular attendance. According to the traditional custom in Japan, however, every small factory or family-scale workshop usually allows a bonus twice a year, viz, in July and December. Few other arrangements to promote the welfare of the workers are found as yet.

For lack of available material, we cannot go into detail with respect to the other parts-manufacturing factories. We are told, however, that their conditions are about the same as those of the foregoing electric lamp manufacturing plants.

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CHAPTER V

CONTROL IN SMALL-SCALE ELECTRIC LAMP MANUFACTURING

The foregoing survey of the small-scale electric lamp manufacturing in Japan has given rise to a serious problem which may deserve further consideration. That is the extreme lack of organization in this field.

Nominally speaking, there are several organizations in this industry. The merchant employers or middlemen form the Electric Lamp Manufacturers' Association for Export, which is federated into the Japanese Union of Electric Lamp Manufacturers' Associations with the association of the "standard" electric lamp companies. The "town factory" owners form the Home-made Electric Lamp Manufacturing Association, and over these various associations presides the Japanese Electric Lamp Society. Thus the "town" electric lamp manufacturing industry is apparently highly organized over the whole field.

But the fact is, as we have already observed, that the competition among the small manufacturers is extremely keen, on account of their entire dependence upon a comparatively smaller number of merchant employers. In the manufacture of "town" lamps, moreover, every process of manufacturing is carried on quite independently by different factories or workshops, so that there is perpetual friction between these different branches of the industry.

Similar friction is seen between the exporters and the merchants or middlemen, and it has become all the more keen since the direct transactions between manufacturers and exporters came to prevail. The result was more serious competition among merchants in lowering the selling price of electric lamps, which in turn lowered the conditions of small manufacturers. The control, therefore, of "town" electric lamp manufacturing is extremely difficult.

The Electric Lamp Manufacturers' Association for Export, which is the most predominant organization in "town" lamp manufacturing and which is organized exclusively by merchants or middlemen, sought to avoid these evils from their own standpoint. At first, it attempted to make an agreement on the selling price of electric lamps. This attempt, however, proved to be far from

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successful owing to the constant violations of the contract by not only those manufacturers who traded directly with exporters, but also sometimes by the merchants themselves. The association then set up an inspection system for export lamps in December of 1932, which also turned out to be incompetent because of the lack of a coercive authority; the exporters soon began to purchase un-inspected articles at cheap prices.

At length, in order to release this industry out of such a chaotic state, the Japanese Ministry of Commerce and Industry granted the Japanese Union of Electric Lamp Manufactures' Associations the right of compelling the inspection of all the electric lamps for export, pursuant to Art. VIII of the Manufacturers' Association Act in November, 1933. The union then fixed an inspection fee of 0.3 sen for an ordinary house-lamp, and 0.05 sen per piece for flash bulbs, etc. It also tried to reduce the number of outsiders by forcing them to pay an inspection charge of eight times as much. Further, it decided to raise the selling price by 30%. Violators, however, still continued to appear for some time till at last, in October of 1934, the Ministry of the Commerce and Industry invested the above union with the exclusive selling right of electric lamps for export in Japan proper. This meant the actual monopoly of the selling right by the merchants and destroyed the direct connections between manufacturers and exporters, which had already prevailed to some extent. As the union, to which the exclusive selling right was bestowed, was that of merchants and "standard" companies and excluded the small manufactures, the small manufacturers began to export their articles via Korea. Some of them ventured to move their factories to Korea which is outside the sphere of the Union's rights of inspection and exclusive sales. Meanwhile, on the other hand, they did the best they could in protesting against this new arrangement. Most of them organized themselves under the name of the Kwanto Electric Lamp Manufacturing Association and proposed joining the Japanese Union of Electric Lamp Manufacturers' Associations as an independent body. The merchants, however, opposed this proposal as they feared a diminition in their assigned share of the export amounts. At length, after much struggle, the members of the Electric Lamp Manufacturing Association secured the right of having their manufactures inspected at a charge of 1.2 times, instead of 8 times, as much as the members of this union.

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The above description shows a bird's eye view of the control which is now being exercised over the small-scale electric lamp manufacturing field. It is as yet far from being perfect or satisfactory, although a great deal of improvement has been made as contrasted with the situation of a few years ago. The weakness lies, we believe, in the fact that the control is now being exercised exclusively among the merchants, and not on a co-operative basis with small manufacturers.

A very interesting and instructive thing in this respect is an effective controlling measure in the bulb-glass manufacturing field—a branch of the electric lamp manufacturing industry—recently taken up by the labour union. The bulb-glass manufacturing workers are wholly controlled by the Kwanto Electric Bulb-Glass Manufacturing Labour Union, a member of the "Sodomei" or the Japanese General Federation of Labour Unions, which is the largest labour union in Japan. The Kwanto Electric Bulb-Glass Manufacturing Labour Union made an agreement in February of 1934 with the Tokyo Electric Bulb Society, the association of the owners of small-scale electric bulb-glass factories, and began to lend positive help to the control of this branch of industry. The two associations of labourers and of owners exchange their advisers with each other and have newly established the Co-operative Committee on Electric Bulb-Glass Manufacture between the two bodies. Since then, this Committee has come to be the pivot of control and supervision over this field of industry.

Above all, it has stipulated the price rates of electric bulb-glass and, on the other hand, has decided to refuse supplying labour to any factory neglecting the agreement stipulated by the Committee. And the labourers who leave such an unfaithful factory are to be safeguarded from unemployment by being entirely employed among the other factories. This arrangement is a very effective one, for the electric bulb-glass manufacturing requires highly skilled labour as contrasted with the other branches of electric lamp manufacturing industry. Thus the agreement on sales-price, which had never succeeded before, has come to be effective for the first time. The Committee also set up the standardization of the products, fixed the standard wage rates, and further established a mutual relief association for the benefit of the workers in September of 1935. Moreover, the Committee adopted as a principle, last summer, the Labour Unions' plan for a month's

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vacation in summer with a view to promoting the health of workers on one hand, and to avoiding severe over-production on the other. And it is also planning a joint purchase of raw materials and a joint sale of the manufactured articles.

The Mutual Relief Association aims, first of all, to safeguard the working class from being reduced to extreme poverty in case of financial need. For this purpose, it collects an equal amount of monthly installments from every worker and employer. The employer, however, may be exempted from paying an installment for any worker who attends the factory less than 25 days in any given month. The sum so collected is paid back to the worker whenever he retires, or becomes ill or injured. In case of his death it is paid to his family. Of late years, its reserve funds have grown to some extent, and therefore it has begun to be made use of when it is necessary to advance money to small factory owners.

The aforesaid labour union, which takes the lead in the Co-operative Committee, has been making the best effort to improve the conditions of the electric bulb-glass manufacturing industry as a whole. Backed up with the eager aid of "Sodomei," it has established an experimental factory at a great sacrifice for the purpose of studying how to rationalize the factory managements as well as with a view to fixing various kinds of adequate standard wage rates fitted for various processes of manufacturing. It also gives useful guidance to ignorant small factory owners as regards technical or legal matters in their factory management, and sometimes acts even as an employment agency for the workers. Thus the labour union has the actual leadership in controlling and improving this industry. The result has hitherto been most hopeful and promising.

Such thorough-going control of production and labour conditions by the positive assistance of the labour union is being carried out nowhere else except in the electric bulb-glass manufacturing industry at present ; while in the other phases of electric lamp manufacturing, workers as well as manufacturers remain almost disorganized. The experiment is of great importance, however, for it indicates the direction of future control not only in the "town" electric lamp manufacturing, but also in the whole field of small-scale manufacturing industries which as yet prevail thoughout this country. On the basis of this valuable experiment, the "Sodomei" has taken a new step in organizing the other small-scale industries.

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Of course it is very difficult to organize small-scale industries, but we believe that the experience attained in the electric bulb-glass manufacturing will serve greatly as a guide for this purpose.

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