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UNITED STATES DEPARTMENT OF LABOR

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BUREAU OF LABOR STATISTICS

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# Earnings in the Manufacture of Industrial Machinery, 1942

(Part 3)



*Bulletin No. 720-B*  
(Continuation of Bulletin No. 720)

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## LETTER OF TRANSMITTAL

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UNITED STATES DEPARTMENT OF LABOR,  
BUREAU OF LABOR STATISTICS,  
Washington, D. C., March 25, 1943.

The SECRETARY OF LABOR:

I have the honor to transmit herewith Part 3 of a report on earnings in the manufacture of industrial and electrical machinery in 1942. This part includes the following five branches: Machine-tool accessories, domestic laundry equipment, refrigerating equipment, carbon products for the electrical industry, and electrical appliances. Part 1, published as Bulletin No. 720, dealt with agricultural machinery, mining machinery and equipment, textile machinery, construction machinery, miscellaneous industrial machinery, and oil-field machinery; while Part 2 (Bulletin No. 720-A) dealt with machine tools, internal-combustion engines, tractors, miscellaneous metalworking machinery, food-products machinery, and mechanical power-transmission equipment. The report was prepared in the Division of Wage Analysis, Robert J. Myers, Chief.

A. F. HINRICHS, *Acting Commissioner.*

HON. FRANCES PERKINS,  
*Secretary of Labor.*

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## PREFACE

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To provide basic information on the effects of the transition to a war economy on industrial products, technological processes, occupational patterns, and wage structures, the Bureau of Labor Statistics has undertaken a series of studies of establishments manufacturing machinery and allied products. This bulletin contains a summary of the data collected during the second and third quarters of 1942 from plants in five branches of the machinery and electrical industries. The individual reports are reprinted, with minor changes, from recent issues of the *Monthly Labor Review*, and the products discussed are machine-tool accessories, domestic laundry equipment, refrigerating equipment, carbon products for the electrical industry, and electrical appliances.

A previous bulletin (No. 720) contains similar information on earnings in the manufacture of agricultural, mining, textile, construction, miscellaneous industrial, and oil-field machinery; while No. 720-A deals with earnings in the manufacture of machine tools, internal-combustion engines, tractors, miscellaneous metalworking machinery, food-products machinery, and mechanical power-transmission equipment. Summaries of the data for other industry branches are in preparation, and are made available in mimeographed form as the analyses are completed.

Each of the industrial branches covered in this series of studies has been defined in terms of the principal products of the various plants during the year 1939—the latest period for which data are available from the Census of Manufactures. It is recognized that a group of plants, classified as constituting an industrial branch in 1939, may be far from a homogeneous group at the present time. It is, nevertheless, useful to begin with the 1939 classification as a starting point. The data on changes in types of product within a former industry are, in themselves, highly significant since they reflect, in addition to the developments which might be expected over a 3-year period, the impact of the war program.

The data for this survey were collected by trained field representatives of the Bureau who visited the plants and analyzed pay rolls and other pertinent records. The detailed wage data on individual employees are limited to day-shift workers in certain occupational groups selected for study either because of their numerical importance or because they are key jobs. In general, however, occupational earnings rates were compiled for 80 to 90 percent of the wage earners employed on day shifts. The several chapters in this bulletin were prepared by Oscar F. Brown and Odis C. Clark under the supervision of Harold R. Hosea.

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*Earnings in the Manufacture of Industrial  
Machinery, 1942 (Part 3)*

**Chapter XIII.—EARNINGS IN THE MANUFACTURE  
OF MACHINE-TOOL ACCESSORIES, 1942**

*Summary*

The importance of machine tools in the production of war materials has naturally resulted in a marked expansion of the plants manufacturing machine-tool accessories; man-hours in the industry have almost quadrupled, and the number of employees has tripled. Average hourly earnings which were 82.9 cents in August 1939 had risen to \$1.074 by the spring of 1942. Earnings in the industry have been affected by the longer workweek, which increased nearly 12 hours during the same interval. If extra payments for overtime were eliminated, average hourly earnings for the spring of 1942 would be reduced nearly 14 cents, to 93.8 cents. It is not possible to calculate accurately the effect on earnings of premiums paid for night work. That they are important, however, is evident from the fact that 69 of the 141 plants studied were operating 2 shifts and 20 were working on a 3-shift basis.

This industry is largely concentrated in midwestern and northeastern States. Midwestern plants appear to pay substantially higher wages than do northeastern plants. This difference, however, is due in part to variations in size of community and in unionization; size of plant and method of wage payment may also have some effect.

Hourly earnings, exclusive of overtime and shift-differential payments, averaged over \$1.00 for each of 26 occupational groups; these employed approximately three-eighths of the male workers for whom detailed earnings data were secured. On the other hand, average hourly earnings were below 60 cents for only 8 occupations.

*Scope of Survey*

According to the Census of Manufactures there were, in 1939, 954 plants engaged primarily in the manufacture of accessories for machine tools and other metalworking machinery. These establishments include plants manufacturing such accessories as jigs and dies, metal cutting and shaping tools, and machinists' precision tools.<sup>1</sup> The 141

<sup>1</sup> This definition corresponds to that of Census Industry No. 1742.

plants from which data were obtained by means of this survey constitute approximately 20 percent of the 687 establishments which employed an average of 6 or more workers during 1939; 267 plants employing 5 workers or less were excluded from the scope of the present survey. The sample plants were selected, as far as possible, to be representative of the industry with respect to geographic region, size (in terms of number of employees), and certain other characteristics. Most of the earnings data reported in this study are based on a representative pay-roll period during April, May, or June 1942.<sup>2</sup>

## *Characteristics of the Industry*

### GEOGRAPHIC DISTRIBUTION

Almost three-fifths of the plants classified by the Bureau of the Census in this industry are in the North Central States, and nearly two-thirds of the industry's workers were employed in this area in 1939. Slightly more than one-third of the plants and workers in the industry were in the Northeastern States; about twice as many plants but only two-thirds as many workers were in the three States of New Jersey, New York, and Pennsylvania as in the New England States. Few such plants are found elsewhere in the country; the Pacific Coast States, next in importance, had only about 5 percent of the plants and less than 1 percent of the workers in the industry.

There is no great similarity in the geographic distribution of plants manufacturing machine-tool accessories and those in the machine-tool industry itself; over one-third of the workers in the machine-tool industry are employed in the New England States, but only about one-fifth of the workers in plants producing accessories are in this area. On the other hand, only a little more than half of the workers in the machine-tool industry are in the North Central States, as compared with nearly two-thirds of those in accessory plants. It is evident that the manufacture of machine-tool accessories is more concentrated in the areas where these accessories are utilized. This is well illustrated by the fact that nearly 30 percent of all workers in the machine-tool-accessories industry are employed in Michigan, center of the automotive industry.

### PRODUCTION OF WAR MATERIALS

The urgent demand for machine tools in the production of war materials has necessitated a rapid expansion in the output of accessories. Very few of the plants manufacturing machine-tool accessories have changed to production of munitions or other direct war materials. The war program has resulted principally in an increase in the number of plants and personnel, with no significant changes in product or technology. This expansion has not been restricted to plants already within the industry at the outbreak of the war; many plants formerly classified in other industries, especially those manufacturing various types of industrial machines, have in the past year produced a substantial volume of machine-tool parts and accessories.

<sup>2</sup> March pay-roll periods were used for 4 plants and July or August pay-roll periods for the 5 other plants.

## THE LABOR FORCE

Distributions by skill class are available for the 11,368 workers for whom detailed earnings data were compiled in the Bureau's study. Approximately 38 percent of the male workers may be regarded as skilled, about 48 percent as semiskilled, and 14 percent as unskilled. It might be expected that this industry, which is characterized by large amounts of high-precision work, would require proportionately larger numbers of skilled workers. The contrast, however, between this and many other machinery industries is not in the numbers of skilled employees, but rather in the proportions of semiskilled and unskilled workers. The plants manufacturing machine-tool accessories show about the same proportion of skilled workers as that found in machinery manufacture generally, but relatively more semiskilled and fewer unskilled workers are employed. The use of large numbers of semiskilled workers is possible in part because of the specialization of individual plants. Many plants in this industry concentrate on only one or two types of accessories, such as chucks, dies, drills, or reamers, even though they may produce many designs of the same type of accessories according to customers' specifications. This specialization permits considerable division and dilution of skill of labor, even in relatively small shops, and much of the high-precision work is thus performed by semiskilled workers operating complex automatic and semiautomatic machinery.

At the time of the present survey, women constituted less than 3 percent of the factory workers in the plants studied; they were employed in only 23 of the 141 plants. In 5 of the plants, however, women constituted over 20 percent of the factory workers, and in 1 of these plants over 50 percent. A somewhat larger proportion of semiskilled than unskilled female workers was employed; few skilled woman workers were reported in the industry. The trend toward the employment of women as machine operators is reflected by the fact that a substantial number of the female workers in this industry are operating grinding machines, milling machines, engine lathes, and drill and punch presses, although not as skilled operators. Other occupations in which women are employed in this industry are inspectors, bench assemblers, burrers, and stock and time clerks. There is little doubt that increasing numbers of women will be employed for these types of work in the future.

In the 26 plants which reported the employment of Negroes, colored persons formed slightly more than 2 percent of the workers; the remaining 115 plants employed no workers of this race. In only 3 plants did Negroes comprise as much as 10 percent of all employees; of the total employment in all the plants studied, they formed less than half of 1 percent. About 40 percent of the colored workers in this industry were employed in unskilled jobs, typically as laborers, helpers, material handlers, and janitors. On the other hand, among the Negroes employed were a working foreman, a toolmaker, 35 grinding-machine operators, and 4 engine-lathe operators. Negroes were found in union and nonunion shops, in large and small plants, in small as well as large cities, and in the East, Midwest, and Far West.

Only about a fourth of the plants studied were operating under agreements with nationally affiliated unions, but the 36 organized

plants employed slightly more than one-third of the workers studied. Twenty-two of the agreements involved unions affiliated with the Congress of Industrial Organizations, 8 with the American Federation of Labor, 5 with the Mechanics' Educational Society of America, and 1 with the International Die Sinkers' Union. Two plants had agreements with an independent union. Union shops were more common in the North Central States; 31 of the 82 plants in that area were operating under union agreements. In fact, among the plants studied, only unions affiliated with the Congress of Industrial Organizations had working agreements in any other area. Approximately 47 percent of the workers in the North Central area were covered by agreements, as compared with about 14 percent of the workers in the Northeastern States; none of the 3 plants studied in the Pacific Coast States had a union agreement.

The typical organized shop in this industry is a large plant situated in a large city. Over 36 percent of the plants with 50 or more workers were union shops; less than 15 percent of the smaller plants reported agreements. In cities of 1,000,000 or more population, 21 of the 45 plants studied were operating under union agreements; only 15 of the 96 plants in the smaller cities were organized.

#### METHOD OF WAGE PAYMENT

Only 12 of the 141 plants employed an incentive method of wage payment for their workers; and only about 40 percent of the workers in these 12 plants were paid piece or bonus rates. The fact that only 10 percent of the workers work under incentive-wage plans reflects the lack of standardization in the accessories for machine tools. Although such parts are relatively small, the designs vary with the specific needs of the purchaser. Thus, frequent set-ups are necessary and processes are not often repetitive or routine; consequently, piece rates cannot easily be established. In small plants (with fewer than 250 employees) less than 1 percent of the workers were paid piece or bonus rates, but in larger plants about 20 percent were paid on an incentive basis.

In 56 plants payment for overtime work was made on the basis of minimum statutory requirements, i. e., time and a half for work over 40 hours per week. In 87 plants this rate also applied to all work over 8 hours in 1 day. In general, the larger plants were more liberal in their provisions for overtime rates; approximately half the plants employing fewer than 100 workers paid overtime rates only as required by Federal statute. On the other hand, all but 7 of the 44 plants employing 100 or more workers reported somewhat more liberal provisions.

Time and a half was paid for overtime work on Saturday in 39 plants and for work on the sixth consecutive day in 2 more, on Sunday in 16 plants, and on holidays in 12 plants. At the time of the survey, double time was paid for work on Sunday in 45 plants and in 1 plant for work on the seventh consecutive day; in 33 plants the double rate was paid for work on holidays. Seven plants paid this rate after 10 hours of work in 1 day, 2 plants after 11 hours, 3 plants after 12 hours, and 1 plant after 16 hours. Six plants paid double time for Saturday work in excess of 8 hours, 1 plant for Saturday work above 10 hours, and another for that in excess of 12 hours.

Of the 141 plants studied, 52 operated on a 1-shift basis, 69 operated 2 shifts, and 20 reported 3 shifts.<sup>3</sup> Of the 89 plants reported as operating more than 1 shift, 27 paid no differential for either evening or night shift; 1 other paid a differential for the night shift but not for the evening shift. Two plants paid premium rates to only a part of the workers on the second shift; 1 plant paid 5 percent extra in the tool and pattern departments, but not in the foundry, and another 10 percent extra to machine-tool operators only. In 5 plants, workers on the second shift were given a half-hour lunch period with pay but no other premium (table 1).

TABLE 1.—*Wage Differentials for Second and Third Shifts in Machine-Tool-Accessories Plants, April-June 1942*

Number of shifts worked	Number of plants	Second shift	Third shift
Plants with 1 shift only.	52	-----	
Plants with 2 shifts.....	22	No differential.....	
	5	A half-hour paid lunch period.....	
	18	5 cents per hour over base rate.....	
	1	5 cents per hour over base rate, plus paid lunch period.	
	1	8 cents per hour over base rate.....	
	7	10 cents per hour over base rate.....	
	1	20 cents per hour over base rate.....	
	1	5 percent over base rate for tool and pattern departments only.	
	1	10 percent over base rate for machine-tool operators only.	
	10	10 percent over base rate.....	
	1	10 percent over base rate, plus paid lunch period.	
	1	1-hour bonus, plus regular daily earnings.	
Plants with 3 shifts.....	5	No differential.....	No differential.
	1	do.....	Work 5 days, paid for 6.
	6	5 cents per hour over base rate.....	5 cents per hour over base rate
	1	do.....	10 cents per hour over base rate
	1	5 percent over base rate.....	5 percent over base rate.
	2	do.....	10 percent over base rate.
	4	10 percent over base rate.....	Do.

Of those plants operating more than 1 shift, 26 paid a 5-cent differential for work on the second shift; one of these paid for the lunch period in addition to the 5-cent bonus. Another plant paid an 8-cent bonus to workers on the evening shift, 7 paid a 10-cent bonus, and 1 paid 20 cents. Some plants paid a bonus based on earnings at the regular rates; 3 paid a differential of 5 percent and 15 a differential of 10 percent, and one of the latter gave a half-hour paid lunch period in addition to the 10-percent bonus. In 1 plant workers on the second shift were paid a bonus of 1 hour's pay. Of the 20 plants which operated 3 shifts, 6 paid a bonus of 5 cents per hour to workers on the night shift, and another paid a bonus of 10 cents. One plant paid a differential of 5 percent to workers on the night shift and 6 plants paid a 10-percent differential. Another plant gave 6 days' pay for 5 days' work on the night shift. Only 5 plants which operated 3 shifts paid no differential for the third shift.

<sup>3</sup> 1 plant operates continuously by the use of 2 long shifts and a swing shift, the latter ordinarily for week ends.

*Hours and Earnings*

TREND FROM 1939 TO 1942

Comparable data on employment and earnings for selected periods since the outbreak of the war are available for 120 of the 141 plants studied. Employment more than tripled in these plants from August 1939 to April-June 1942. The average workweek increased from slightly less than 43 hours in August 1939 to over 54 hours in April-June 1942 (table 2). This parallel expansion in employment and lengthening of the workweek resulted in an increase in man-hours in these identical firms to nearly 4 times the corresponding figure for August 1939. The increase in activity varied somewhat for different types of plants.

**TABLE 2.—Average Hourly Earnings and Average Weekly Hours in 120 Machine-Tool-Accessories Plants for Specified Periods, 1939-42**

Period	Average hourly earnings	Estimated average hourly earnings, exclusive of extra overtime payments	Average weekly hours
August 1939.....	\$0.829	\$0.791	42.6
April 1940.....	.845	.794	44.3
August 1940.....	.861	.787	47.5
February 1941.....	.875	.789	49.4
August 1941.....	.937	.843	49.7
April-June 1942.....	1.074	.938	54.3

In plants which employed fewer than 50 workers in August 1939, the average workweek increased from slightly less than 44 hours to approximately 55 hours—a rise of over 25 percent (table 3). On the other hand, the workweek in the larger plants increased nearly 29 percent, from approximately 42 to 54 hours. Since the rate of increase in the number of employees was also somewhat higher in the larger plants, the increase in man-hours was over 12 percent greater in these plants than in the smaller establishments.

**TABLE 3.—Average Hourly Earnings and Average Weekly Hours in 118<sup>1</sup> North Central and Northeastern Machine-Tool-Accessories Plants, August 1939 and April-June 1942**

Item	Average hourly earnings			Estimated average hourly earnings, exclusive of extra overtime payments			Average weekly hours		
	August 1939	April-June 1942	Percent of increase	August 1939	April-June 1942	Percent of increase	August 1939	April-June 1942	Percent of increase
North Central plants <sup>2</sup> .....	\$0.895	\$1.180	31.8	\$0.847	\$1.032	21.8	43.5	54.2	24.6
Northeastern plants <sup>3</sup> .....	.683	.831	21.7	.661	.725	9.7	40.7	54.6	34.2
Plants with—									
Fewer than 50 workers...	.810	1.057	30.5	.764	.919	20.3	43.9	55.1	25.5
50 or more workers.....	.841	1.083	28.7	.807	.948	17.4	41.9	54.0	28.8

<sup>1</sup> Plants in Pacific Coast States are not included in this table.

<sup>2</sup> Includes plants in Illinois, Indiana, Iowa, Michigan, Missouri, Ohio, and Wisconsin.

<sup>3</sup> Includes plants in Connecticut, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont.

The workweek in plants in the Northeast increased approximately 34 percent on the average, from slightly more than 40 to nearly 55 hours. By contrast, the workweek in the North Central plants increased only about 25 percent, from nearly 44 hours to slightly more than 54 hours. The rate of increase in man-hours of work was about 5 percent higher for plants in the Northeast than for those in the North Central States.

After eliminating the effect of increased overtime, average hourly earnings in these 120 plants rose from 79.1 cents in August 1939 to 93.8 cents in April-June 1942, an increase of approximately 19 percent for the 33-month period. The rate of increase was somewhat higher for plants which employed fewer than 50 workers in 1939 than for larger plants. In a regional comparison, the average hourly earnings in North Central plants show a rate of increase over twice as great as for plants in the Northeast, 21.8 as compared with 9.7 percent.

#### PLANT AVERAGES

Although plant averages are often distorted by extra overtime payments and shift differentials, they do serve, within certain limits, to show variations among plants in the earnings of the workers. Data for general average earnings of all workers were secured for 139 plants.

A comparison of plant averages shows very little difference between large and small plants, a difference rather common among other industries. The explanation is due, in part, to certain differences in the composition of the labor force. Small plants are unable to effect as much division of labor as large plants. Consequently, with less dilution of skill, they must employ a larger proportion of skilled labor.

TABLE 4.—*Distribution of Machine-Tool-Accessories Plants by Plant Average Hourly Earnings and by Size of Plant, April-June 1942*

Plant average hourly earnings	All plants	Plants employing—	
		100 workers or less	Over 100 workers
\$0.40 and under \$0.50.....	2	2	—
\$0.50 and under \$0.60.....	6	3	3
\$0.60 and under \$0.70.....	7	4	3
\$0.70 and under \$0.80.....	18	14	4
\$0.80 and under \$0.90.....	20	14	6
\$0.90 and under \$1.00.....	17	11	6
\$1.00 and under \$1.10.....	18	15	3
\$1.10 and under \$1.20.....	15	11	4
\$1.20 and under \$1.30.....	14	8	6
\$1.30 and under \$1.40.....	4	2	2
\$1.40 and under \$1.50.....	8	5	3
\$1.50 and under \$1.60.....	2	1	1
\$1.60 and under \$1.80.....	5	3	2
\$1.80 and under \$2.00.....	2	1	1
\$2.00 or over.....	1	1	—

#### AVERAGE EARNINGS BY OCCUPATION

Straight-time average earnings in 5 occupational groups of male workers—class A boring-mill operators, class A grinding-machine operators, class A lay-out men, wood-pattern makers, and class A tool and die makers—were substantially above \$1.30 per hour. In 12 other occupations, average earnings were more than \$1.10 per hour, and in 9 more the average hourly earnings were above \$1.00. Thus,

average hourly earnings were more than \$1.00 in 26 occupational groups, in which were employed nearly 38 percent of the male workers for whom detailed earnings data were secured.

On the other hand, in 6 occupational groups other than apprentices and learners, the average hourly earnings were below 60 cents. The occupations at this lower wage level were class C burrsers, elevator operators, machine operators' helpers, class C punch-press operators, class C testers, and hand truckers. Average hourly earnings were less than 70 cents for 19 other occupational groups. In 27 occupations (including apprentices and learners), in which were employed slightly less than 25 percent of the male workers for whom detailed earnings data are available, average earnings were below 70 cents per hour. The range of average earnings for male workers was from 53.7 cents per hour for hand truckers to \$1.44 for wood-pattern makers.

It is evident that comparative wage levels of different classes of workers in some occupations are influenced by variations in wage structure. Classes B and C inspectors have the same average wage in the industry as a whole (table 5). This is the result of the disproportionate number of class C inspectors who are employed in the North Central plants, which generally paid higher wages. This factor also explains why there is so little difference between earnings for classes B and C grinding-machine operators and classes B and C punch-press operators.

TABLE 5.—Average Hourly Earnings<sup>1</sup> of Day-Shift Workers in Selected Occupations in Machine-Tool-Accessories Plants, April-June 1942

Occupation and class	United States		New England and Middle Atlantic		North Central	
	Percent of workers	Average hourly earnings	Percent of workers	Average hourly earnings	Percent of workers	Average hourly earnings
Total workers.....	100.0	\$0.914	100.0	\$0.768	100.0	\$1.008
Male workers.....	97.6	.923	97.0	.778	98.0	1.016
Acetylene-burner operators.....	( <sup>2</sup> )	.790			.1	.790
Apprentices, first year.....	1.0	.545	.7	.526	1.1	.539
Apprentices, second year.....	.9	.692	.9	.626	.8	.733
Apprentices, third year.....	.4	.785	.3	.659	.4	.844
Apprentices, fourth year.....	.1	.919	( <sup>2</sup> )	( <sup>2</sup> )	.1	.989
Assemblers, bench, class A.....	1.0	1.132	.7	.917	1.1	1.218
Assemblers, bench, class B.....	1.6	.814	2.1	.745	1.3	.887
Assemblers, bench, class C.....	1.0	.717	.4	.701	1.3	.720
Assemblers, floor, class A.....	.4	1.041	.2	.849	.5	1.096
Assemblers, floor, class B.....	.4	.785	.1	.720	.6	.791
Assemblers, floor, class C.....	.2	.778	( <sup>2</sup> )	( <sup>2</sup> )	.3	.787
Boring-mill operators, class A.....	.8	1.380	.2	1.003	1.2	1.417
Boring-mill operators, class B.....	.2	.978	.1	( <sup>2</sup> )	.3	1.037
Broaching-machine operators.....	1.1	.864	.1	( <sup>2</sup> )	.1	.837
Buffers.....	1.3	.874	1.5	.738	1.2	.982
Burrers, class B.....	.4	.776	.7	.731	.2	.864
Burrers, class C.....	.3	.579	.5	.551	.2	.623
Carpenters, class A.....	( <sup>2</sup> )	1.004	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )
Carpenters, class B.....	.1	.664	.2	.630	( <sup>2</sup> )	( <sup>2</sup> )
Carpenters, class C.....	.2	.631	.2	.533	.1	.766
Casting cleaners.....	.7	.654	.4	( <sup>2</sup> )	.9	.689
Coremakers, class A.....	.4	1.092	.1	( <sup>2</sup> )	.6	( <sup>2</sup> )
Crane operators.....	.1	.996			.1	.996
Craters.....	.1	.642	.1	( <sup>2</sup> )	.1	.679
Die setters.....	.1	.900			.1	.900
Drill-press operators, class A.....	.5	.935	.5	.904	.5	.953
Drill-press operators, class B.....	.7	.719	1.0	.628	.5	.839
Drill-press operators, class C.....	.7	.648	.7	.552	.8	.704
Drop-hammer operators, class A.....	.1	.968	( <sup>2</sup> )	.840	.1	( <sup>2</sup> )
Electricians.....	.3	1.026	.2	.708	.4	1.124
Elevator operators.....	.1	.587	( <sup>2</sup> )	( <sup>2</sup> )	.1	( <sup>2</sup> )
Firemen, stationary boiler.....	.1	.626	.2	.584	( <sup>2</sup> )	( <sup>2</sup> )
Foremen, working, class A.....	1.2	1.220	1.6	1.079	1.0	1.372
Foremen, working, class B.....	.5	.836	.6	.782	.4	.887
Foremen, working, class C.....	.1	.806	.1	.590	.1	.888

See footnotes at end of table.

TABLE 5.—Average Hourly Earnings<sup>1</sup> of Day-Shift Workers in Selected Occupations in Machine-Tool-Accessories Plants, April-June 1942—Continued

Occupation and class	United States		New England and Middle Atlantic		North Central	
	Percent of workers	Average hourly earnings	Percent of workers	Average hourly earnings	Percent of workers	Average hourly earnings
<b>Male workers—Continued.</b>						
Gear cutters, class A	0.1	\$1.103	( <sup>2</sup> )	( <sup>3</sup> )	0.2	\$1.157
Gear cutters, class B	.2	.840	0.2	\$0.597	.3	.925
Gear finishers	.3	.743	.6	.647	.2	.929
Grinding-machine operators, class A	6.8	1.343	6.4	1.193	7.4	1.427
Grinding-machine operators, class B	7.5	.785	8.9	.699	6.9	.855
Grinding-machine operators, class C	.8	.733	.6	.567	1.3	.749
Heat treaters, class A	6.9	1.038	.6	.792	.7	1.186
Heat treaters, class B	.8	.750	1.0	.586	.7	.906
Helpers, journeymen's	.8	.731	.6	.575	1.0	.789
Helpers, machine operators	.6	.599	.8	.494	.5	.710
Inspectors, class A	1.0	1.166	.8	.824	1.1	1.332
Inspectors, class B	1.7	.745	1.5	.550	1.7	.863
Inspectors, class C	.7	.748	.3	.518	1.0	.739
Janitors	1.8	.657	1.7	.512	1.8	.747
Job setters	.5	1.010	4	.890	.5	1.084
Laborers	1.3	.650	1.0	.573	1.4	.685
Laborers, foundry	.3	.682	.2	( <sup>3</sup> )	.4	.723
Lathe operators, engine, class A	3.7	1.170	3.3	1.035	4.0	1.243
Lathe operators, engine, class B	3.4	.774	4.1	.671	2.9	.869
Lathe operators, engine, class C	.8	.653	1.1	.494	.6	.830
Lathe operators, turret, class A	1.1	1.132	1.2	.954	1.0	1.275
Lathe operators, turret, class B	1.0	.819	1.2	.661	1.0	.943
Lay-out men, class A	.1	1.418	( <sup>2</sup> )	( <sup>3</sup> )	.1	1.579
Learners, journeyman	1.7	.623	2.6	.535	1.1	.757
Learners, machine operator	7.2	.628	6.3	.501	8.0	.693
Learners, other	1.0	.571	1.7	.524	.5	.677
Machinists, class A	1.7	1.150	1.7	1.069	1.6	1.206
Machinists, class B	1.2	.860	1.3	.736	1.1	.952
Metal-saw operators	.8	.725	.8	.675	.8	.760
Milling-machine operators, class A	2.9	1.152	3.1	.949	2.7	1.306
Milling-machine operators, class B	3.6	.821	4.4	.718	3.2	.913
Milling-machine operators, class C	.4	.738	1.0	.723	.1	.890
Millwrights	.7	.843	.6	.683	.7	.933
Packers	1.0	.621	1.3	.506	.9	.733
Painters, brush	.3	.747	.2	.502	.3	.816
Painters, spray	.1	.881	( <sup>2</sup> )	( <sup>3</sup> )	.1	.895
Patternmakers, wood	.2	1.440	.1	( <sup>3</sup> )	.4	1.517
Planer operators	.6	1.034	.4	.829	.8	1.113
Punch-press operators, class A	.1	1.074	.4	1.036	( <sup>3</sup> )	( <sup>3</sup> )
Punch-press operators, class B	.3	.666	.6	.648	.2	.711
Punch-press operators, class C	.6	.589	.7	.518	.5	.644
Repairmen, machine, class A	1.1	1.020	1.0	.752	1.2	1.167
Sandblasters	.1	.929	.1	( <sup>3</sup> )	.2	1.018
Screw-machine operators, class A	.5	1.170	.2	.826	.6	1.240
Screw-machine operators, class B	.7	.786	.6	.651	.9	.849
Screw-machine operators, class C	.3	.691	.2	.487	.3	.808
Shaper operators	.9	1.123	.6	.967	1.2	1.176
Stock clerks	2.4	.720	2.1	.593	2.6	.790
Straighteners	.8	.964	1.3	.954	.4	.986
Testers, class B	.1	.625	.1	( <sup>3</sup> )	( <sup>3</sup> )	( <sup>3</sup> )
Testers, class C	.1	.581	.2	( <sup>3</sup> )	( <sup>3</sup> )	( <sup>3</sup> )
Thread-milling-machine operators	.4	.823	.7	.826	.2	.819
Time clerks	.4	.642	.2	.584	.4	.654
Tool and die makers, class A	9.4	1.352	8.7	1.227	9.6	1.476
Tool and die makers, class B	.1	.855	.3	.855		
Tool grinders	1.2	1.168	.8	.700	1.4	1.330
Truck drivers	.5	.818	.2	.607	.4	.866
Truckers, hand	.5	.537	.6	.459	.4	.628
Watchmen	1.3	.621	1.1	.521	1.5	.669
Welders, hand, class A	.2	1.147	( <sup>2</sup> )	( <sup>3</sup> )	.2	1.156
Welders, hand, class B	.1	.770	( <sup>2</sup> )	( <sup>3</sup> )	.1	.784
Welders, machine	.3	.811	.4	.636	.1	1.143
<b>Female workers</b>	2.4	.559	3.0	.459	2.0	.656
Assemblers, bench	.1	.460	.3	.450	( <sup>2</sup> )	( <sup>3</sup> )
Burrers	.1	.471	.2	.436	( <sup>2</sup> )	( <sup>3</sup> )
Drill-press operators	.1	.444	.2	.444		
Grinding-machine operators	.4	.502	.8	.520	.2	.463
Inspectors	.4	.704	.3	.409	.5	.833
Lathe operators, engine	.1	.563	( <sup>2</sup> )	( <sup>3</sup> )	.1	.583
Learners	.4	.537	.1	.427	.5	.558
Milling-machine operators	.4	.624	.6	.467	.3	.848
Packers	.1	.533	.3	.445	.1	( <sup>3</sup> )
Punch-press operators	.1	.527			.1	.527
Stock clerks	.1	.473	.2	.394	.1	( <sup>3</sup> )
Time clerks	.1	.441	( <sup>2</sup> )	( <sup>3</sup> )	.1	( <sup>3</sup> )

<sup>1</sup> Averages are based on actual earnings exclusive of extra payments for overtime. <sup>2</sup> Less than 0.05 percent. <sup>3</sup> Number of plants and/or workers too small to justify computation of an average.

Among female workers in the industry, average earnings ranged from 44.1 cents per hour for time clerks to 70.4 cents for inspectors. Only 1 other occupational group, milling-machine operators, received an average of more than 60 cents per hour. Average earnings in 5 of the 12 occupations in which any substantial number of women were employed were less than 50 cents per hour.

The low earnings of female workers in an industry which otherwise has a relatively high wage level are due to several factors. First, the employment of women in any substantial numbers in the industry is comparatively recent, and many of the female workers are still employed at starting rates. Second, because of their recent hiring, these women are often employed at the more routine and repetitive tasks, whereas men are performing the more complicated jobs. With some few exceptions, moreover, the plants employing the larger numbers of women were plants with average hourly rates below the level for the industry.

#### DIFFERENCES IN REGIONS AND METROPOLITAN AREAS

The combined weighted totals shown in table 5 indicate a wage advantage of about 24 cents per hour for workers in the North Central States over those in the Northeast. When the comparison is made for individual occupations of male workers, a substantial difference in the same direction is also generally found, an outstanding exception being the job of thread-milling-machine operators. Workers in this occupation in the Northeast received on an average less than 1 cent more than those doing similar work in the North Central plants. In all other occupations for which reliable comparisons are possible the workers in the North Central plants received higher earnings than those in the Northeastern plants. For 61 of the 71 occupations for male workers the differences were greater than 10 cents per hour; for 25 occupations the differences were as great as 25 cents; and in 8 the differences were greater than 40 cents per hour. These regional differences are, in part, a reflection of the wage levels of two large metropolitan areas, Cleveland and Detroit; 31 of the 82 North Central plants were in these areas.

It is evident from table 6 that male workers in plants situated in large cities receive higher wages than those employed in smaller communities. Workers employed by plants in metropolitan areas of 500,000 or more population received an average of 15 cents more than those in less heavily populated areas. In 40 of the 45 occupational groups for which reliable comparisons could be made, the workers in the large metropolitan areas received the higher earnings. Workers in large metropolitan areas had a wage advantage of 20 cents or more in 17 occupations. In the plants in large metropolitan areas, 16 of the 45 occupational groups had average earnings of \$1.00 or more per hour, but only 9 occupational groups in plants in smaller communities had average hourly earnings as high as \$1.00. On the other hand, in the smaller communities 22 of the 45 occupations showed average earnings of less than 70 cents per hour, as compared with only 5 occupations in the large metropolitan areas.

TABLE 6.—Average Hourly Earnings of Male Day-Shift Workers in Selected Occupations in Machine-Tool-Accessories Plants, by Size of Metropolitan Area, April-June 1942

Occupation and class	Average hourly earnings <sup>1</sup> in metropolitan areas of—		Occupation and class	Average hourly earnings <sup>1</sup> in metropolitan areas of—	
	Less than 500,000 population	500,000 or more population		Less than 500,000 population	500,000 or more population
All occupations.....	\$0. 857	\$1. 003	Lathe operators, engine—Con.		
Apprentices, first year.....	. 500	. 601	Class B.....	\$0. 688	\$0. 844
Apprentices, second year.....	. 651	. 743	Class C.....	. 494	. 729
Assemblers, class A.....	. 884	1. 240	Lathe operators, turret:		
Assemblers, class B.....	. 679	. 905	Class A.....	. 994	1. 205
Assemblers, class C.....	. 520	. 761	Class B.....	. 650	. 890
Boring-mill operators, class A.....	1. 304	1. 423	Learners, journeyman.....	. 644	. 608
Buffers.....	. 811	. 990	Learners, machine operator.....	. 520	. 700
Drill-press operators:			Learners, other.....	. 542	. 613
Class B.....	. 645	. 827	Machinists, class A.....	1. 172	1. 130
Class C.....	. 579	. 714	Machinists, class B.....	. 921	. 801
Foremen, working, class A.....	1. 173	1. 321	Metal-saw operators.....	. 703	. 743
Grinding-machine operators:			Milling-machine operators:		
Class A.....	1. 187	1. 467	Class A.....	. 971	1. 288
Class B.....	. 719	. 836	Class B.....	. 721	. 886
Class C.....	. 631	. 812	Millwrights.....	. 791	. 948
Heat treaters, class A.....	. 856	1. 242	Packers.....	. 547	. 723
Heat treaters, class B.....	. 631	. 928	Planer operators.....	. 872	1. 150
Helpers, journeymen's.....	. 724	. 740	Repairmen, machine, class A.....	. 804	1. 223
Inspectors, class A.....	1. 016	1. 295	Screw-machine operators, class		
Inspectors, class B.....	. 640	1. 048	B.....	. 658	. 960
Inspectors, class C.....	. 598	. 806	Shaper operators.....	1. 014	1. 197
Janitors.....	. 553	. 753	Stock clerks.....	. 624	. 807
Laborers.....	. 609	. 682	Straighteners.....	. 967	. 954
Lathe operators, engine:			Tool and die makers.....	1. 402	1. 362
Class A.....	1. 079	1. 259	Tool-grinder operators.....	1. 066	1. 224
			Watchmen.....	. 591	. 662

<sup>1</sup> Averages are based on actual earnings exclusive of extra payments for overtime.

## Chapter XIV.—EARNINGS IN THE MANUFACTURE OF DOMESTIC LAUNDRY EQUIPMENT, 1942

### *Summary*

In the summer of 1942, the 9 plants included in this survey were using nearly all of their facilities in the production of direct war materials; considerable plant conversion was found necessary. All but 1 of the establishments studied were working at least 2 shifts.

Employment in these plants increased over 40 percent between August 1939 and the summer of 1942; average hourly earnings increased 25.3 cents—from 68.8 cents to 94.1 cents per hour—during the same period. It is estimated that about a third of this rise in earnings was a result of increases in extra payments for overtime work. Average hourly earnings in plants which had over 250 workers were about 14 percent higher than those in establishments with 250 or fewer. This industry is concentrated in the North Central States.

More than a tenth of the workers were in the 10 occupational groups which showed average hourly earnings of \$1 or more, exclusive of extra payments for overtime and night work; 4 percent were in groups which averaged less than 60 cents per hour.

### *Scope of Survey*

According to the latest Census of Manufactures (1939), there were, in the United States, 42 plants "engaged primarily in the manufacture of laundry equipment for household use, comprising washing machines, ironing machines, wringers, driers, and extractors, whether operated by mechanical power or by hand."<sup>4</sup> Of this total, 5 establishments reported fewer than 6 wage earners, and were excluded from the scope of this survey. The remaining 37 plants as a group employed an average of 7,456 workers during 1939, and slightly over a third (36.6 percent) were working in the 9 establishments included in this survey. This small industry is largely concentrated in the North Central States. In 1939 almost three-fifths of all the plants and approximately two-thirds of the workers in the industry were in the 3 States of Illinois, Iowa, and Ohio. Few such plants are found elsewhere; New York, with about an eighth of the wage earners in the industry, is the only State outside the North Central region in which the manufacture of domestic laundry equipment is important. The plants selected for study are distributed in essentially the same manner. The current earnings data shown in this report are based on a representative pay-roll period during July or August 1942.

### *Characteristics of the Industry*

#### TYPE OF PRODUCT

The manufacture of domestic laundry equipment is a highly specialized industry and makes use of a particular pattern of standard metalworking techniques. The electrical equipment used in most of

<sup>4</sup> This definition corresponds to that of Census Industry No. 1781.

the items produced is purchased from manufacturers of electrical devices, and only the larger establishments operate their own foundries. Washing machines for household use were by far the most important single product of the industry; in 1939, this one item accounted for over 80 percent by value of the total output. Over 90 percent of the household washers produced in 1939 were electrically driven; the remaining machines were powered mostly by gasoline engines. The manufacture of hand-operated machines was relatively unimportant. Aside from household washers, electric ironing machines constituted the only other important single article of production in the industry. A miscellaneous group consisting for most part of ironing attachments, wringers, cabinet driers, extractors, parts, and accessories accounted for about 11 percent by value of the total output.

Included among the products mentioned above was a substantial output of goods made as secondary products by establishments classified by the Census in other industries; the domestic laundry equipment made by such concerns amounted to nearly 10 percent of the value of the total produced in the United States. On the other hand, less than 2 percent of the value of total production of domestic-laundry-equipment plants consisted of products not classified in this industry.

#### PRODUCTION OF WAR MATERIALS

The effect of the war was relatively retarded in this industry. Until fairly late in 1942, the plants studied were almost wholly engaged in manufacturing their usual products at an increasing rate. Of the 9 plants covered in the survey, the 3 which were producing war materials in 1941 were using less than 1 percent of their facilities in defense production. By August 1942, however, all the plants in the survey were manufacturing direct war materials, and small as well as large plants were affected. The transition to war production had no marked effect on employment in the industry as a whole, but in the case of several of the small and medium-sized plants there was some difficulty in adjusting to the war effort at the time of the present survey. Employment in 6 of the 9 plants studied was still below the level for the preceding year. Three plants were using about two-thirds of their facilities in direct war production, and in the remaining 6 establishments the corresponding figure amounted to 90 percent or more. Regular production was, in most instances, limited to the manufacture of repair parts.

The radically different nature of war materials made substantial technological changes necessary in some of the plants studied; a few of the establishments had to retool their plants extensively. Several of the converted plants were concentrating on one specialized type of war material.

#### THE LABOR FORCE

Detailed earnings data were compiled for about two-thirds of all the workers employed in the plants surveyed; this group included practically all the workers on day shift. Approximately a fourth (24.4 percent) of the male wage earners for whom wage and occupational data were collected were working at skilled jobs, 43.7 percent

were doing semiskilled work, and the remainder, who constituted about a third (31.9 percent) of the wage earners studied, were classified as unskilled.

At the time the present survey was made, women constituted slightly over 8 percent of the total employees in the plants studied. Over 90 percent of all the women found were working in 1 plant, where they amounted to about 23 percent of the total working force. The most common occupations were class C inspectors and learners in various occupations; several female class B and C bench assemblers, class C drill-press operators, and class C burrers were reported. About three-fifths (59.2 percent) of the female wage earners found in the industry were doing semiskilled work, while the remainder (40.8 percent) were all working at unskilled jobs; no women employed at skilled jobs were found. The high percentage of semiskilled women can probably be attributed to a policy of encouraging the training of woman workers by the 1 plant which employed nearly all those found in the survey. Only 2 Negroes were employed by the establishments surveyed; both were working as janitors in the same plant.

Seven of the 9 plants had agreements with nationally affiliated unions. Four of these agreements were with unions affiliated with the Congress of Industrial Organizations and 3 with unions affiliated with the American Federation of Labor. In addition, an independent labor union was recognized in one of the large plants. The 1 remaining plant employed fewer than 50 workers and was unorganized.

#### METHOD OF WAGE PAYMENT

Largely because of the lack of standardization resulting from the wide variety of processes involved in manufacturing most of the products of this industry, all but two of the plants studied paid on the basis of straight hourly rates. Of the 2 plants which used an incentive system, 1 had somewhat less than 250 employees, and the other had over 1,000. In these 2 plants which made use of such a system, and in which somewhat over two-fifths (43.0 percent) of the workers in all the plants studied were employed, about a fourth (24.0 percent) were paid incentive-wage rates; these workers constituted about a twelfth (8.8 percent) of all workers studied in the industry. There was some modification of wage-payment methods with the shift to war production and the resulting need for new machines. In most cases, however, there appears to have been a tendency to retain the existing wage structure.

One of the establishments studied paid no overtime rates beyond minimum statutory requirements, i. e., time and a half for all work above 40 hours a week. This premium rate was paid by the other 8 plants studied for work in excess of 8 hours in a day, and by 3 plants for all Saturday work. Three establishments also paid on this same basis for Sunday work, and 1 paid time and a half for holiday operation. Double-time rates were effective on Sundays and holidays in 2 plants.

The high degree of utilization of the productive equipment of the domestic-laundry-equipment industry is evident from the fact that, of the 9 plants studied, only 1 operated on a single-shift basis, while 4 operated two shifts, and the remaining 4 establishments

reported three shifts (table 7). All the 8 plants operating more than 1 shift were paying shift differentials at the time the survey was made. In the group of 4 plants which reported 2 shifts, 3 paid the second-shift workers a premium of 5 cents per hour, and 1 paid 5 percent over the base rate. Four establishments worked both a second and a third shift. Three of these plants paid the same bonus to workers on both shifts, i. e., 5 cents per hour; the other plant allowed second-shift workers a differential of 5 percent over the base rate, while its third-shift employees received a rate of 10 percent above those on the day shift.

TABLE 7.—*Wage Differentials for Second and Third Shifts in 9 Domestic-Laundry-Equipment Plants, July–August 1942*

Number of shifts worked	Number of plants	Differential paid for—	
		Second shift	Third shift
Plants with 1 shift only.....	1		
Plants with 2 shifts.....	3	5 cents per hour.....	
	1	5 percent over base rate.....	
Plants with 3 shifts.....	3	5 cents per hour.....	5 cents per hour.
	1	5 percent over base rate.....	10 percent over base rate.

### Employment, Hours, and Earnings

#### TREND FROM 1939 TO 1942

Total employment in the 9 establishments as a group increased over 40 percent during the 3-year period for which comparable data are available; the increase was from 2,131 in August 1939 to 3,013 in July–August 1942 (table 8). Average hourly earnings including premium payments for overtime and night work, which amounted to 68.8 cents in the earlier period, had increased to 94.1 cents by the time the survey was made; this rise of 25.3 cents represents a gain of 36.8 percent.

TABLE 8.—*Employment, Average Hourly Earnings, and Average Weekly Hours of Workers in 9 Domestic-Laundry-Equipment Plants for Specified Periods, 1939–42*

Year and month	Total wage earners <sup>1</sup>	Average hourly earnings	Estimated average hourly earnings exclusive of extra overtime payments	Average weekly hours
August 1939.....	2,131	\$0.688	\$0.669	39.9
April 1940.....	2,583	.709	.702	36.2
August 1940.....	2,441	.741	.733	36.5
February 1941.....	2,641	.721	.715	35.4
August 1941.....	2,971	.787	.764	40.3
July–August 1942.....	3,013	.941	.867	46.6

<sup>1</sup> Data for 1 company used with reduced weight to avoid overrepresentation of large plants.

During the same period, the average workweek in these plants as a group had lengthened 6.7 hours, from 39.9 to 46.6 hours, a change which progressively inflated hourly rates as a result of increased

premiums for overtime. It is estimated that the elimination of extra payments for overtime work would reduce average hourly earnings for the latest period by 7.4 cents or to about 86.7 cents; on this basis average hourly rates, exclusive of premium payments for overtime and night work, increased by an estimated 19.8 cents, or nearly 30 percent.

#### PLANT AVERAGES

Average hourly earnings, including premium payments for overtime and night work, amounted to 94.1 cents for the entire 9 plants included in the survey. The averages for individual plants varied from 63 cents in the case of a medium-sized plant in a small city to \$1.17 paid in a somewhat smaller establishment in one of the largest industrial centers. Three of the 9 plants showed average hourly earnings of \$1 or more; an equal number reported average earnings below 80 cents.

The tendency for average earnings to increase with size was far from uniform among these plants; the establishment with the highest average hourly earnings of all the plants studied had fewer than 100 workers, and showed an average rate of \$1.17 per hour. On the other hand, one of the plants with over 1,000 employees paid average hourly earnings about 9 cents below the average for the industry as a whole, despite the large amount of overtime work in that particular establishment. These variations from the general tendency for hourly earnings to vary directly with plant size are probably due in part to organization on a job basis of some of the small plants in which higher proportions of skilled workers are employed, and to the ability of some of the larger plants to make use of mass-production techniques, with consequent dilution of skill, and, in one case, by the extensive use of female labor.

There is a general tendency, however, for average hourly earnings to vary directly with plant size, despite exceptions in the case of individual establishments. Average earnings in the four plants which had 250 or more workers were 14.9 cents per hour higher than the average for those in the smaller size groups. The apparent wage advantage of workers in the larger establishments was due in part to the use of an incentive-payment plan and extensive overtime payments in one of the largest of the plants surveyed.

The fact that the domestic-laundry-equipment industry is largely concentrated in the North Central States precludes any analysis of plant averages on the basis of geographical location. Likewise, an analysis of the relationship between size of community and levels of earnings expressed in terms of plant averages would be inconclusive, partly because of the small number of establishments included in the survey and because such variations are obscured by the combined effect of other and more important factors such as methods of plant operation, unionization, plant size, systems of wage payments, and sex distribution of workers.

Average hourly earnings in the two plants which were not operating under agreements with nationally affiliated unions were about 10 cents lower than the figure for the organized plants. This difference of more than 10 cents per hour is not, of course, to be interpreted as a result of the union factor alone. The working force of the two unorganized plants contained a large number of female workers, as well

as a substantially greater percentage of male wage earners in the less highly skilled occupational groups than were employed in the union establishments. On the other hand, one of the unorganized plants was among the largest in the industry. The net effect of these two factors, which tend to offset one another, cannot be stated precisely on the basis of the data available.

## OCCUPATIONAL DIFFERENCES IN EARNINGS

Average hourly earnings, exclusive of premium payments for overtime and night work, are shown for 1,740 male workers, who constituted about three-fourths of the day-shift workers in the plants surveyed (table 9). These hourly averages (excluding those for apprentices and learners) ranged from 58.5 cents for watchmen to \$1.152 for tool and die makers. The general hourly average for all workers in the occupations containing adequate numbers of workers (and distributed among a sufficient number of plants) to warrant detailed study was 82.3 cents. This figure is 4.4 cents below the estimated hourly earnings of 86.7 cents for the industry shown in table 2; the difference is due, at least in part, to the inclusion of shift differentials in the industry average.

TABLE 9.—Average Hourly Earnings<sup>1</sup> of Day-Shift Workers in Selected Occupations in Domestic-Laundry-Equipment Plants, July-August 1942

Occupation and class	Number of workers	Average hourly earnings	Occupation and class	Number of workers	Average hourly earnings
All workers.....	1,740	\$0.823	Lathe operators, turret:		
Acid dippers.....	7	.893	Class A.....	37	\$0.941
Apprentices, first year.....	8	.600	Class B.....	94	.818
Apprentices, second year.....	8	.713	Learners, journeyman and other.....	42	.680
Assemblers, bench, class A.....	16	.998	Learners, machine operator.....	19	.563
Assemblers, bench, class B.....	39	.874	Milling-machine operators:		
Assemblers, bench, class C.....	60	.633	Class A.....	25	1.023
Buffers.....	15	.944	Class B.....	107	.787
Burrers, class B.....	9	.818	Millwrights, class A.....	7	.973
Burrers, class C.....	40	.789	Millwrights, class B.....	7	.790
Carpenters, class B.....	9	.823	Molders, machine, class A.....	19	1.096
Casting cleaners.....	19	.929	Packers.....	26	.684
Craters, class B.....	5	.760	Painters, spray.....	7	.949
Drill-press operators, class A.....	18	1.094	Patternmakers, metal.....	7	1.012
Drill-press operators, class B.....	38	.742	Patternmakers, wood.....	6	1.039
Drill-press operators, class C.....	79	.773	Platers.....	11	.750
Electricians, class B.....	11	.931	Repairmen, machine.....	23	.836
Electricians, class C.....	5	.754	Repairmen, product, class B.....	16	.790
Firemen, stationary boiler.....	11	.828	Screw-machine operators:		
Foremen, working, class A.....	41	1.104	Class A.....	16	1.093
Foremen, working, class B.....	40	.897	Class B.....	13	.855
Grinding-machine operators:			Class C.....	107	.882
Class A.....	9	1.059	Shake-out men.....	8	.815
Class B.....	14	.851	Sheet-metal workers, class B.....	5	.754
Heat treaters, class B.....	13	.801	Stock clerks.....	87	.662
Helpers, journeymen's and other.....	13	.715	Testers, class B.....	11	.877
Helpers, machine operators.....	11	.764	Time clerks.....	22	.627
Inspectors, class A.....	13	.998	Tool and die makers.....	56	1.152
Inspectors, class B.....	65	.840	Tool-grinder operators.....	24	.838
Inspectors, class C.....	36	.732	Truck drivers.....	8	.687
Janitors.....	48	.655	Truckers, hand.....	29	.686
Job setters.....	55	.996	Truckers, power, inside.....	5	.668
Laborers.....	17	.675	Watchmen.....	46	.585
Laborers, foundry.....	30	.593			
Lathe operators, engine:					
Class A.....	7	1.073			
Class B.....	41	.900			

<sup>1</sup> Averages are based on actual earnings exclusive of extra payments for overtime.

Ten occupational groups showed averages of \$1 or more per hour. These groups contained about 200 workers, and included almost a half (48.1 percent) of the skilled employees and slightly over one-tenth (11.7 percent) of all workers for whom detailed occupational data were compiled. By far the largest of the groups earning an average of \$1 or more were the tool and die makers, who, as stated above, also received the highest average hourly earnings. Of the occupational groups studied, the averages for four were under 65 cents per hour; 4 percent of the employees, apart from apprentices and learners, were in the two occupational groups which were paid averages under 60 cents per hour.

As already stated in connection with general plant averages, a comparison of wage rates on a regional basis is not possible, because of the small proportion of the industry outside the North Central region. Likewise, the small number of plants in the sample surveyed, as well as the other factors mentioned in connection with plant averages, does not permit analysis of average hourly earnings on the basis of size of community, unionization, and method of wage payment.

Occupational rates do tend, however, to vary significantly in relation to the average number of workers employed per plant, despite the fact that, as already noted in analyzing plant averages, the relationship is by no means uniform. In order to compare occupational rates in the larger and smaller plants, workers in each of the classifications which contain numbers adequate to permit reliable comparisons are divided into two groups: those in plants with fewer than 250 employees, and those in larger plants. For the 373 employees in plants with fewer than 250 workers average hourly earnings were 73.1 cents, whereas the corresponding figure for the 1,367 wage earners in the group of larger plants was 84.7 cents.

In many occupations, the numbers of workers are insufficient to permit any reliable comparison of hourly rates between plants of different size groups, or the distribution of occupations between the smaller and larger plants is so uneven that relative rates are difficult to compute.

There are 16 occupational groups, however, in which the numbers of employees are believed to be adequate for comparisons of average hourly rates between the large and small plants (table 10). For 13 of these occupations, the average earnings of workers in the large plants are higher than the corresponding figure for the smaller establishments; in 6 instances the difference in occupational averages between the two size groups was 20 cents or more. The three occupations in which wage differences were in favor of the small plants were highly skilled. The fact that average hourly earnings of certain class C workers shown in table 9 are slightly above the corresponding rates for class B operators in the same occupational groups is a further reflection of the tendency of the larger establishments to pay higher wages; in such cases, plants in the large size group reported a greater number of workers in the lower classification.

**TABLE 10.—Average Hourly Earnings<sup>1</sup> of Day-Shift Male Workers in 9 Domestic-Laundry-Equipment Plants, by Occupation and Size of Plant, July–August 1942**

Occupation and class	Average hourly earnings in plants employing—		Occupation and class	Average hourly earnings in plants employing—	
	250 workers or less	Over 250 workers		250 workers or less	Over 250 workers
Number of workers <sup>2</sup> .....	373	1,367	Lathe operators, engine, class B.....		
Average hourly earnings <sup>2</sup> .....	\$0.731	\$0.847	Lathe operators, turret, class B.....	\$0.605	\$1.008
Buffers.....	.921	.969	Milling-machine operators:	.633	.843
Burrers, class C.....	.591	.884	Class A.....	1.055	.998
Drill-press operators, class B.....	.643	.800	Class B.....	.633	.917
Foremen, working, class B.....	.710	.961	Repairmen, product, class B.....	.714	.851
Inspectors, class A.....	1.030	.979	Stock clerks.....	.614	.671
Inspectors, class B.....	.674	.904	Tool and die makers.....	1.252	1.109
Janitors.....	.560	.666	Watchmen.....	.533	.610
Job setters.....	.966	1.001			

<sup>1</sup> Averages are based on actual earnings exclusive of extra payments for overtime.

<sup>2</sup> Includes workers in occupations not shown separately below.

## Chapter XV.—EARNINGS IN THE MANUFACTURE OF REFRIGERATING EQUIPMENT, 1942

### *Summary*

By the summer of 1942, the production of domestic refrigerators had practically ceased, and the eight plants included in this survey were either producing refrigerating equipment on Government order, or were engaged in manufacturing direct war materials. Considerable technological conversion was necessary. The greatest concentration of the industry is in the East North Central States.

The shift to war production caused employment to decrease in 1942 to about the figure for April 1940. Average earnings increased 23.5 cents—from 78.2 cents to \$1.017 per hour—from April 1940 to the summer of 1942. The lengthening of the average workweek by about 5 hours, however, resulted in some inflation of average hourly earnings, owing to extra payments for overtime; the actual increase in hourly rates is estimated at about 18 cents—from 75.1 cents to 93.5 cents.

Nearly a third of the male workers for whom detailed earnings data were compiled were in occupations with hourly earnings averaging in excess of \$1.00 per hour in the summer of 1942; approximately a sixth were in groups which averaged less than 75 cents an hour.

### *Scope of Survey*

Reports on the latest Census of Manufactures (1939) show that there were in the United States 309 establishments "whose principal products are mechanical refrigerators (both the motor-driven or compression type and the absorption or heat-actuated type) and refrigerating systems (both domestic and commercial), cabinets for sale as such (whether for use with mechanical refrigerating systems or for use with ice), and industrial ice-making and refrigerating machines."<sup>6</sup> This Census classification does not include the construction of built-in cooling rooms, cabinets, and similar equipment. Of the 309 establishments, 112 reported an average of fewer than 6 wage earners, and were excluded from the scope of this study. The remaining 197 plants, as a group, employed an average of 34,829 workers during 1939, and over a third were working at that time in the 8 establishments included in this survey.

The manufacture of refrigerating equipment is characterized by a high degree of concentration: about 85 percent of its wage earners and three-fifths of the plants are found in two areas—the East North Central States (Ohio, Michigan, Indiana, Illinois, and Wisconsin) and the Middle Atlantic States (New York, Pennsylvania, and New Jersey). The former group of States had somewhat over a fourth (28.8 percent) of the industry's plants and over two-thirds (68.2 percent) of the wage earners; the Middle Atlantic region reported less than a fifth (18.1 percent) of the wage earners, but nearly a third (30.7 percent) of the industry's plants.

In these two regions the industry is largely concentrated in four adjoining States—Pennsylvania, Ohio, Michigan, and Indiana. While

<sup>6</sup> This definition corresponds to that of Census Industry No. 1784. The branches of the industry studied in this survey are, as a group, more limited than the Census definition. That part of the industry to which the data collected are especially applicable will be referred to hereafter as the "refrigerating equipment" industry.

these four States have a fourth (25.6 percent) of the plants in the refrigerating-equipment industry, over three-fourths (76.0 percent) of the workers are within their borders. Outside of these two regions, for the most part only smaller plants are found. Although other sections reported two-fifths of the plants in the industry, they included only 14 percent of the total number of wage earners.

Establishments selected for study were, for the most part, engaged in the production of commercial refrigerating equipment and systems, air-conditioning equipment, and industrial ice-making and refrigerating machines. These plants have a fairly wide geographical distribution and, in addition, were selected as representative with respect to size, unionization, and certain other factors. The data in this report, therefore, are most applicable to the branches of the industry just enumerated. Domestic refrigerator plants are not represented in proportion to their numerical importance at the time the manufacture of such equipment for the general market was discontinued. The data for two of the companies studied are used with reduced weight in order to avoid overrepresentation of large plants. The earnings data shown in this report are based on a representative pay-roll period during July and August 1942.

### *Characteristics of the Industry*

The branches of the industry which are studied in this report accounted for nearly half of the value of the total 1939 output of the industry as defined by the Census of Manufactures. The broader scope of the Census definition includes domestic electric refrigerators, a product which, as noted above, this survey was not designed to include. The most important peacetime groups of products of the branches of the industry studied consisted of commercial-type refrigerators, which accounted for over a third of all production. Separately made cabinets, display cases, etc., for mechanical refrigerators amounted to about a fifth of output, while the manufacture of air-conditioning equipment and commercial refrigerating and ice-making machines were smaller branches of the industry.

### **PRODUCTION OF WAR MATERIALS**

The impact of the war was felt relatively late by this industry; until 1942 the plants studied were engaged for the most part in manufacturing their usual products at a moderately increasing rate. Of the eight plants covered in the survey, the one establishment which produced war material in 1941 reported only 10 percent of its total output in that category; however, in the same year three plants were receiving high priority ratings on 40 to 70 percent of their production.

By August 1942, with the exception of one small establishment, all the plants included in the survey had been given priority ratings on 90 percent or more of all production. Two establishments were using 60 to 70 percent of their facilities in the production of direct war materials; in two other plants, including one of the largest in the industry, direct war production accounted for practically the entire output. It is worthy of note that a substantial proportion of this industry, including some of the largest establishments, apparently had difficulty in shifting to production of war materials.

At the time of the present survey, total employment in the plants studied was still more than a sixth below the figure for the previous year, when the output of the usual products of the industry was near its all-time peak.

To some extent, the plants in this industry were using their regular facilities in 1942 to produce refrigerating equipment on Government order. To the extent that they produced direct war materials, however, technological conversion was necessary. The amount of such conversion in some of the plants studied may be judged by the fact that one of the large establishments in the industry discontinued its usual production entirely, and was compelled to undertake a program of extensive retooling when it shifted to the exclusive production of machine guns, aircraft propellers, and aircraft parts. Another plant reported that a completely different occupational pattern resulted after initiation of war production. Among the war materials being produced, in addition to those already mentioned, were electric communication products, naval gun parts, ordnance, and ordnance supplies.

#### THE LABOR FORCE

Detailed earnings data were compiled for nearly four-fifths of all the workers employed in the plants surveyed; this group included practically all of those on day shifts. Thirty percent of the males whose wage and occupational data were studied in detail were working at skilled jobs; 46.2 percent were doing semiskilled work; and the remaining 23.4 percent were classified as unskilled.

At the time the present study was made, women constituted slightly over 5 percent of all employees in the plant studied. Over 95 percent of all the women found were working in two plants; in one of these establishments they amounted to nearly 30 percent of the total working force. The most common occupations for women in the industry were class C bench assemblers, class C drill-press operators, and class C burrs. One large plant had a considerable number working as class B milling-machine operators. For the most part, however, woman workers were working at unskilled jobs.

Approximately 85 percent of all the Negroes reported in the establishments surveyed were working in one large midwestern plant where they constituted 3 percent of all the employees. Negroes, in this as in other branches of the machinery industries studied by the Bureau, were employed mostly as janitors and laborers; some, however, were reported as hand truckers, chippers, and machine molders.

Five of the eight plants studied had agreements with nationally affiliated unions. One of these agreements, which covered a very large plant, was with the United Electrical, Radio and Machine Workers of America, a union affiliated with the Congress of Industrial Organizations. The other four plants had contracts with the International Association of Machinists, the Sheet Metal Workers International Association, the United Brotherhood of Carpenters and Joiners of America, and the Stove Mounters International Union—all American Federation of Labor groups. The organized plants included all of those in the small-size group. In three other plants, including two of the three largest establishments surveyed, independent unions were recognized.

## METHOD OF WAGE PAYMENT

Of the five establishments with fewer than 300 employees, all but one paid on a straight hourly basis, presumably because of the inability of plants in that size group to use mass-production techniques in the wide variety of processes involved in manufacturing most of the products of this industry. Of the four plants which used some form of incentive system, one had fewer than 1,000 employees; each of the other three establishments had over 1,000. In the eight plants as a group, over two-fifths (42.3 percent) of the employees were paid under some plan of varying rates according to output. In the four plants which made use of such methods, somewhat less than half of all the employees (46.8 percent) were paid on the basis of incentive rates.

Provisions for the payment of overtime in the group of plants surveyed are more liberal than in other branches of the machinery industry studied in one respect: none of the plants reported extra overtime as low as minimum statutory requirements, i. e., time and a half only for work above 40 hours a week; all of the plants reported payment of this rate for work in excess of 8 hours in one day. Two establishments paid on this same basis for Sunday work, and, of these, one also paid time and a half for Saturday operation. Double-time rates were effective on Sundays in two plants, and on holidays in three plants.

Of the eight plants studied, the three smallest operated on a single-shift basis, one operated two shifts, and the remaining four plants reported three shifts (table 11). Aside from one of the plants which reported three shifts, and which allowed no premium to second-shift workers, all five plants operating more than one shift were paying shift differentials at the time the survey was made. The one plant which reported two shifts paid the second shift a differential of 10 percent over base rate. Four establishments worked both a second and a third shift; three of these paid the same bonus to both shifts—5 percent over base rate in the case of two plants—while the other establishment paid a differential of 3 cents per hour. The other plant which reported three shifts gave no differential to the second shift, but paid the third shift a bonus of 2 cents per hour.

TABLE 11.—*Wage Differentials for Second and Third Shifts in 8 Plants Manufacturing Refrigerating Equipment, July–August 1942*

Number of shifts worked	Number of plants	Differential paid for—	
		Second shift	Third shift
Plants with 1 shift only.....	3		
Plants with 2 shifts.....	1	10 percent over base rate.....	
Plants with 3 shifts.....	1	No differential.....	2 cents per hour.
	2	5 percent over base rate.....	5 percent over base rate.
	1	3 cents per hour.....	3 cents per hour.

*Employment, Hours, and Earnings*

TREND FROM 1940 TO 1942

It is not possible to present data on the trend of earnings beginning with August 1939, as in previous reports in this series, since data on hours and earnings are not available for 1939. Complete information was, however, supplied by all the plants studied for April 1940 and subsequent specified periods. The total number employed in the establishments studied was about the same at the beginning and at the end of the 29-month period for which comparable data are available; the exact figures were 5,216 in April 1940 and 5,199 in the summer of 1942 (table 12). From the beginning of the period for which complete reports are available to August 1941, however, employment rose nearly a fourth, owing to an expansion in the output of the industry's usual products. The transition to war production brought problems of readjustment that resulted in a reduction of total employment to a figure approximately that reported at the beginning of the period.

TABLE 12.—*Employment, Average Hourly Earnings, and Average Weekly Hours of Workers in 8 Refrigerating-Equipment Plants, for Specified Periods, 1940-42*

Year and month	Total wage earners †	Average hourly earnings	Estimated average hourly earnings, exclusive of extra overtime payments	Average weekly hours
April 1940.....	5,216	\$0.782	\$0.751	41.9
August 1940.....	4,777	.800	.784	38.5
January 1941.....	5,450	.824	.791	41.9
August 1941.....	6,344	.898	.867	41.2
July-August 1942.....	5,199	1.017	.935	46.8

† Data for 2 companies used with reduced weight to avoid overrepresentation of large plants.

Average hourly earnings (including extra payments for overtime and night work), which amounted to 78.2 cents at the beginning of the 29-month period, had increased to \$1.017 by the time the survey was made; this rise of 23.5 cents represents a gain of 30.1 percent. During the same period the average workweek in the plants as a group had lengthened nearly 5 hours (from 41.9 to 46.8), a change which progressively inflated hourly rates as a result of increased premiums for overtime. The actual increase in average hourly earnings is thus somewhat smaller because of the exclusion of premium payments for overtime work. It is estimated that the elimination of such amounts would reduce average rates for the latest period by 8.2 cents or to about 93.5 cents; on this basis average hourly rates, exclusive of premium payments for overtime work, increased by an estimated 18.4 cents, or nearly 25 percent.

## PLANT AVERAGES

Average hourly earnings, including premium payments for overtime and night work, amounted to \$1.017 for the eight plants as a group. For individual plants the averages varied from 67.5 cents in the case

of the one Southern plant to \$1.13 paid by one of the largest establishments in the industry. In three of the plants studied, the figure was over \$1.00. At the other extreme an equal number of plants reported average earnings below 90 cents; only one of these showed rates below 80 cents per hour.

Although there is a general tendency among these plants for average hourly earnings to vary directly with plant size, the relationship is not uniform. Thus, average earnings in plants employing over 500 workers were 9.9 cents above the average of 95.3 cents per hour in plants with fewer than 250 workers, but in plants of the intermediate group (i. e., those which have between 250 and 500 employees) earnings were 19 cents below the corresponding figure for the smaller plants. This apparent wage advantage on the part of workers in the small plants is probably due in part to their organization on a job basis, which involves the employment of larger proportions of skilled workers. The wage advantage of workers in the largest-sized plants was due in part to the prevalence of incentive-wage systems and the relatively greater importance of premium overtime payments.

Substantial variations in the extent to which plant averages are affected by differences in plant size and methods of plant operation, as well as the small number of establishments included in the survey, combine to obscure any possible relationship between size of community and levels of earnings expressed in terms of general plant averages.

#### OCCUPATIONAL DIFFERENCES IN EARNINGS

Average hourly earnings, exclusive of premium payments for overtime and night work, are available for 3,952 workers, who constituted practically all of the day-shift workers in the plants surveyed. For male workers alone, these averages (excluding those for apprentices) ranged from 56.8 cents for class C burrs to \$1.32 for class A lay-out men (table 13). The general hourly average for all workers in the occupations containing adequate numbers (and distributed among a sufficient number of plants) to warrant detailed study was 91.1 cents. This figure is 2.4 cents below the estimated hourly earnings of 93.5 cents for the industry shown in table 12. This difference is due, at least in part, to the inclusion of shift differentials in the industry average. For male workers alone the average is 91.8 cents, a figure less than 1 cent above that for male and female workers combined.

Of the male occupational groups with sufficient distribution to warrant special study, 30 showed averages of \$1.00 or more per hour; these groups comprise over 1,100 workers and include nearly all of the skilled employees, or about 30 percent of all male workers, for whom detailed occupational data were compiled. By far the largest of the groups earning averages of \$1.00 or more were the class A grinding-machine operators and job setters. Of the male occupational groups studied, 14 were paid averages under 75 cents per hour; about 17 percent of the male employees, apart from learners and apprentices, were in these occupational classes.

About 5 percent of the workers in the industry are women; average hourly earnings of the 117 in the occupations studied in detail were 68.5 cents. Only 1 occupational group was found in which the number of plants and workers was sufficiently large to warrant the listing of

average earnings. The 59 female workers in this group, class C bench assemblers, averaged 65.1 cents per hour.

Average hourly earnings in the five plants which had agreements with nationally affiliated unions were somewhat higher (11.1 cents) than in the three plants in which independent unions were recognized, despite the fact that two establishments in the latter group were among the largest in the industry.

TABLE 13.—Average Hourly Earnings<sup>1</sup> of Day-Shift Workers in Selected Occupations in Refrigerating-Equipment Plants, July-August 1942

Occupation and class	Number of workers	Average hourly earnings	Occupation and class	Number of workers	Average hourly earnings
All workers.....	3,952	\$0.911	Male workers—Continued.		
Male workers.....	3,835	.918	Lathe operators, turret:		
Acetylene-burner operators.....	24	(?)	Class A.....	48	\$1.071
Acid dippers.....	27	.912	Class B.....	39	.934
Apprentices, first year.....	17	.535	Lay-out men, class A.....	21	1.320
Apprentices, second year.....	38	.621	Learners.....	75	(?)
Apprentices, third year.....	9	.792	Machinists, class A.....	37	1.240
Apprentices, fourth year.....	5	.833	Metal-saw operators.....	9	.945
Assemblers, bench, class A.....	52	1.011	Milling-machine operators:		
Assemblers, bench, class B.....	99	.914	Class A.....	26	1.097
Assemblers, bench, class C.....	225	.754	Class B.....	114	.985
Assemblers, floor, class A.....	40	1.080	Millwrights, class A.....	24	1.104
Assemblers, floor, class B.....	18	.791	Millwrights, class B.....	14	.943
Assemblers, floor, class C.....	7	.742	Packers.....	29	.796
Boring-mill operators, class A.....	26	1.090	Painters, brush.....	32	.881
Boring-mill operators, class B.....	16	(?)	Painters, spray.....	36	.868
Broaching-machine operators.....	10	(?)	Patternmakers, wood.....	5	1.244
Buffers.....	62	(?)	Pipe fitters.....	45	1.075
Burrers, class B.....	78	(?)	Plater operators.....	12	1.060
Burrers, class C.....	16	.568	Platers.....	8	1.048
Carpenters, class A.....	32	.957	Power-shear operators.....	13	.758
Carpenters, class B.....	14	(?)	Punch-press operators, class B.....	50	.873
Chippers, class B.....	14	.807	Repairmen, machine.....	48	1.062
Crane operators.....	14	.790	Repairmen, product, class A.....	6	(?)
Craters, class A.....	40	.947	Sandblasters.....	8	.903
Craters, class B.....	8	.689	Screw-machine operators:		
Drill-press operators:			Class A.....	34	1.184
Class A.....	47	1.047	Class B.....	47	1.003
Class B.....	86	.937	Shaper operators.....	8	1.027
Class C.....	88	.683	Sheet-metal workers, class A.....	39	1.127
Electricians, class A.....	39	1.098	Sheet-metal workers, class B.....	11	.821
Electricians, class B.....	11	.958	Solderers, class B.....	24	(?)
Elevator operators.....	7	.714	Solderers, class C.....	10	.569
Firemen, stationary boiler.....	15	.741	Stock clerks.....	270	.821
Foremen, working, class A.....	29	1.143	Testers, class A.....	8	.906
Foremen, working, class B.....	15	1.039	Testers, class B.....	6	.804
Furnace and oven operators.....	16	.996	Testers, class C.....	13	(?)
Grinding-machine operators:			Time clerks.....	21	.869
Class A.....	104	1.153	Tool and die makers.....	95	1.269
Class B.....	72	(?)	Tool-grinder operators.....	20	1.030
Helpers, journeymen's and other.....	66	.695	Truck drivers.....	16	.775
Helpers, machine operators.....	67	.678	Truckers, hand.....	56	.654
Inspectors, class A.....	34	1.092	Truckers, power, inside.....	36	.859
Inspectors, class B.....	179	(?)	Watchmen.....	84	.791
Inspectors, class C.....	27	.694	Welders, hand, class A.....	57	1.147
Janitors.....	115	.697	Welders, hand, class B.....	47	.925
Job setters.....	102	1.125	Welders, machine.....	45	.721
Laborers.....	98	.711	Woodworkers.....	16	.913
Lathe operators, engine:			Female workers.....	117	.685
Class A.....	43	1.114	Assemblers, bench, class C.....	59	.651
Class B.....	22	1.023	Burrers, class C.....	24	(?)
			Drill-press operators, class C.....	34	(?)

<sup>1</sup> Averages are based on earnings exclusive of premium payments for overtime.

<sup>2</sup> Number of plants and/or workers too small to justify computation of an average.

As already stated in connection with plant averages, a tabulation of wage rates on a regional basis is not possible, because of the small proportion of the industry situated outside the North Central region.

The one Southern establishment studied showed a marked difference as compared with the other plants in the industry. Despite payment on an incentive basis, averages in the Southern plant were more than 25 cents below the figure for the other seven plants as a group.

No conclusion can be drawn concerning the effect of the use of incentive methods on average hourly earnings from a study of the four plants where such systems were in operation. The averages in such plants, as a group, were considerably higher than those for establishments which paid on the basis of hourly rates, but no precise estimate of the effect on earnings of wage-payment methods can be made because of the greater influence of other factors such as geographical location and plant size. Likewise, the small number of establishments

TABLE 14.—Average Hourly Earnings<sup>1</sup> of Day-Shift Male Workers in Refrigerating-Equipment Plants, by Occupation and Size of Plant, July–August 1942

Occupation and class	Average hourly earnings in plants employing—		Occupation and class	Average hourly earnings in plants employing—	
	500 workers or less	Over 500 workers		500 workers or less	Over 500 workers
Number of workers <sup>2</sup> .....	566	3,269	Inspectors, class A.....	\$0.917	\$1.146
Average hourly earnings <sup>2</sup> .....	\$6.740	\$0.949	Inspectors, class B.....	.726	.995
Assemblers, bench, class B.....	\$0.689	\$0.957	Janitors.....	.498	.729
Assemblers, bench, class C.....	.603	.811	Laborers.....	.514	.759
Assemblers, floor, class A.....	.933	1.129	Lathe operators, turret:		
Assemblers, floor, class B.....	.661	.876	Class A.....	1.123	1.011
Carpenters, class A.....	.659	1.042	Class B.....	.851	.986
Drill-press operators:			Packers.....	.614	.891
Class A.....	.928	1.061	Painters, spray.....	.645	.933
Class B.....	.723	.951	Punch-press operators, class B.....	.652	.903
Class C.....	.649	.811	Sheet-metal workers, class A.....	1.139	1.122
Foremen, working, class A.....	1.155	1.133	Stock clerks.....	.709	.833
Helpers, machine operators <sup>2</sup> .....	.634	.635	Tool and die makers.....	1.288	1.268
			Truck drivers.....	.634	.840

<sup>1</sup> Averages are based on earnings exclusive of premium payments for overtime.

<sup>2</sup> Includes workers in occupations not shown separately below.

covered by the study, as well as the other factors mentioned in connection with plant averages, does not permit comparisons of hourly average earnings between the larger and smaller communities.

Occupational rates do tend, however, to vary significantly in relation to the average number of workers employed per plant, despite the fact that, as already noted in analyzing plant averages, the relationship is by no means uniform. In order to compare occupational rates in the larger and smaller plants, workers in each of the classifications which contain adequate numbers to permit reliable comparisons are divided into two groups—those in plants with less than 500 employees and those in the larger plants. All the establishments which fall into the latter group have over 1,000 workers each. For the 566 employees of plants with less than 500 workers, average hourly earnings were 74.0 cents, while the corresponding figure for the 3,269 workers in the larger plants as a group was 94.9 cents (table 14). In many occupations, the numbers of workers are insufficient to permit reliable comparison of hourly rates between plants of different size groups, and

the distribution of occupations between the small and large plants is so uneven that comparative rates are difficult to compute.

There are 23 occupational groups, however, in which the numbers of employees are believed to be adequate for comparisons between the large and small plants. For 19 of these occupations, the averages for workers in the large plants are higher than the corresponding figures for the small establishments; in 13 instances the differences between the 2 plant groups are more than 20 cents per hour. For 4 highly skilled occupations, the averages were higher in the small plants; however, in only one instance was the difference more than 2.2 cents per hour.

It should be noted that, with the shift to war production and the virtual cessation in the production of many refrigerator products, a considerable modification in occupational patterns resulted; one plant reported an entirely different pattern after conversion. As far as possible, however, existing wage structures were retained.

## Chapter XVI.—EARNINGS IN THE MANUFACTURE OF CARBON PRODUCTS FOR ELECTRICAL INDUSTRY, 1942

### *Summary*

Seven of the eight plants included in this survey had been assigned high priority ratings by the summer of 1942; of these, six were devoting between 90 and 100 percent of their output to products with high priority ratings. No important technological changes appear to have been necessary. All of the larger plants were operating two or three shifts.

Average hourly earnings increased from 70.8 cents in August 1939 to 93.0 cents by the summer of 1942. However, the earnings were affected by a 5-percent increase in the average workweek after August 1939, and the actual increase in rates was about 20 cents an hour. Employment in the summer of 1942 was  $2\frac{1}{2}$  times the figure for August 1939.

A fourth of the male workers for whom detailed earnings data are available were in occupations with hourly earnings (exclusive of extra payments for overtime and night work) averaging \$1.00 or more in the summer of 1942; less than 3 percent were in groups averaging under 75 cents per hour. Plants of the larger size group paid substantially higher wages.

### *Scope of Survey*

Reports of the latest Census of Manufactures (1939) show that in the United States as a whole 31 plants were "engaged primarily in the manufacture of carbons; carbon, graphite, and metal-graphite brushes; plates, rods, and powder for making brushes; electrodes, and miscellaneous carbon; graphite, and metal-graphite specialties, including rings for steam seal."<sup>6</sup> Of this total, 6 establishments reported fewer than 6 wage earners and were excluded from the scope of this survey. The remaining 25 plants employed an average of 3,176 workers during 1939, and over a fourth were working in the 8 establishments included in this survey. Somewhat less than half of the plants and slightly more than half of the employees in this small industry in 1939 were found in New York and Pennsylvania alone. Most of the remainder of the plants manufacturing carbon products were in the East North Central States, where Ohio, with 29 percent of the industry's employees, was the most important single State. Three plants were in the South. The current earnings data shown in this report are based, in most instances, on a representative payroll period during July or September 1942.

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<sup>6</sup> This definition corresponds to that of Census Industry No. 1612.

## *Characteristics of the Industry*

### TYPE OF PRODUCT

The carbon-products industry is one of the small divisions of the electrical-products group, and supplies essential specialties made of carbon, graphite, and metal-graphite. Of the total output of products of this type, slightly over 50 percent consists of carbon or graphite electrodes. Brushes, plates, rods, powder, and miscellaneous carbon, graphite, and metal-graphite specialties for electrical uses make up the remainder. Slightly over 90 percent of the 1939 national output of products of this nature was made by plants primarily engaged in the manufacture of carbon products; nearly 10 percent represented secondary production of other industries. On the other hand, of the total output by value of the companies classified by the Census as primarily engaged in the production of carbon products for the electrical industry, 8 percent consists of products commonly made by plants classified in other industries.

### PRODUCTION OF WAR MATERIAL

No important technological changes appear to have been necessary in this industry as a part of its war effort. Its standard peacetime products are demanded on a greatly increased scale by other industries which produce war materials directly. The war has thus resulted in a greatly expanded industry, using its regular techniques and equipment on a larger scale. In 1940, the use of the industry's facilities in defense production was not a factor of any importance. At the end of 1941, however, half of the eight plants studied were producing materials with high priority ratings. By the summer of 1942, seven of the establishments surveyed were reported performing work essential to the defense effort, and of this group, six plants were applying between 90 and 100 percent of their capacity to defense production.

### THE LABOR FORCE

Detailed earnings data were compiled for about 70 percent of all workers employed in the plants surveyed; this group amounted to between 80 and 90 percent of those on day shifts. Of the males for whom wage and occupational data were collected, slightly more than an eighth (13.2 percent) were on skilled jobs; nearly two-fifths (39.2 percent) were doing semiskilled work; and the remainder, nearly half (47.6 percent) of the workers studied, were working at unskilled jobs.

Women constituted nearly 10 percent of the factory workers studied. In one medium-sized plant, over three-fifths of the employees were women. The most common occupations for women were those of class C bench assemblers, class C inspectors, and packers. Other occupations in which women were found were dip painters, riveting-machine operators, tamper operators, and learners. This industry shows a substantial percentage of female workers above the unskilled level; nearly half (47.2 percent) were classified in semiskilled occupations. In all the plants surveyed, however, only 1 woman of a total of 199 studied was doing skilled work. Six Negroes were employed in the plants surveyed, and all but 1 were working in a single southern plant.

Three of the eight plants had agreements with nationally affiliated unions, but these three plants employed 80 percent of all the workers studied. Both of the establishments in the survey having over 500 employees were organized. The other unionized plant employed fewer than 50 workers. Of these agreements, one was with an American Federation of Labor union, and two were with unions affiliated to the Congress of Industrial Organizations. In addition, an independent union was recognized in one medium-sized plant. The remaining four plants were unorganized.

#### METHOD OF WAGE PAYMENT

The typical products of the carbon-products industry tend to be small or medium in size and are used as standard parts by other branches of the electrical industry. Even in a small industry these product characteristics permit plant organization to some extent on the basis of mass-production techniques. The present survey shows that nearly a fourth (22.7 percent) of the workers in the industry were working under some form of incentive system. Of the three plants in which workers were paid piece or bonus rates, two were in the largest size group, i. e., those having more than 500 workers; the third reported over 250 employees. In these three plants 25.5 percent of the employees were working under some form of incentive system. The other five plants paid straight hourly rates to all factory workers.

The two smallest plants studied paid no extra overtime rates beyond minimum statutory requirements, i. e., time and a half for all work over 40 hours a week. The other six plants paid this same rate for work in excess of 8 hours a day; in addition, two plants applied this premium rate to Saturday work, and, in three plants, this rate was also paid for work on Sunday and holidays. One of the larger plants paid double time on Sundays and holidays.

The increased demand for carbon products as a result of war activity has resulted in a high degree of utilization of the industry's facilities, especially by means of extra shifts. The three plants operating only one shift were the smallest included in the survey, while all three of the largest plants studied were operating three shifts. The only plant operating two shifts paid a differential of 5 cents per hour to workers on the second shift (table 15). In the group of four plants reported as operating three shifts, one paid no premium to workers on either late shift; one establishment allowed the same bonus (10 percent) to workers on both late shifts, while two gave an additional differential to the third shift. The extra compensation paid by each of these two firms was a premium of 5 percent to workers on the second shift and 7 percent to those on the night shift.

TABLE 15.—*Wage Differentials for Second and Third Shifts in Eight Carbon-Products Plants, July–September 1942*

Number of shifts worked	Number of plants	Second shift	Third shift
Plants with 1 shift only.....	3		
Plants with 2 shifts.....	1	5 cents per hour.....	
Plants with 3 shifts.....	1	No differential.....	No differential.
	2	5 percent over base rate.....	7 percent over base rate.
	1	10 percent over base rate.....	10 percent over base rate.

*Employment, Hours, and Earnings*

TREND FROM 1939 TO 1942

Comparable data on employment for selected periods in 1939-42 are available for seven of the eight plants included in the survey. In these seven establishments as a group, employment in the summer of 1942 was 2½ times the figure for August 1939; the increase was from 920 to 2,302 workers (table 16). Average hourly earnings, which amounted to 70.8 cents in August 1939 (including extra payments for overtime and night work), had increased to 93.0 cents by the time the survey was made; this rise of 22.2 cents represents a gain of nearly a third (31.4 percent).

TABLE 16.—*Employment, Average Hourly Earnings, and Average Weekly Hours in 7 Carbon-Products Plants<sup>1</sup> for Specified Periods, 1939-42*

Period	Total number of wage earners	Average hourly earnings <sup>2</sup>	Estimated average hourly earnings, exclusive of extra overtime payments	Average weekly hours
August 1939.....	920	\$0. 708	\$0. 688	40. 2
April 1940.....	1, 322	. 739	. 720	39. 6
August 1940.....	1, 441	. 726	. 706	40. 1
January 1941.....	1, 583	. 757	. 734	40. 6
August 1941.....	2, 103	. 798	. 766	41. 9
January 1942.....	2, 196	. 862	. 816	43. 4
July-September 1942.....	2, 302	. 930	. 889	42. 4

<sup>1</sup> Data for 1 plant excluded because comparable figures for this plant were not available for earlier periods. Inclusion of data for the period covered in 1942 would show gross average hourly earnings of 93.2 cents and an average of about 88.0 cents, exclusive of extra overtime payments.

<sup>2</sup> Averages include earnings resulting from extra payments for overtime and night work.

During the same period, the average workweek in these plants had lengthened 2.2 hours, a change which resulted in some inflation of average hourly rates as a result of increased premiums for overtime. The elimination of such premium payments is estimated to reduce the average hourly earnings for the latest period by 4.1 cents, or to about 88.9 cents. During the 3-year period hourly earnings, exclusive of premium overtime payments, rose about 20 cents, an increase of nearly 30 percent. The one plant for which comparable data covering the earlier periods were not available employed slightly more than 250 workers; the inclusion of wage data for this plant has a negligible effect on average hourly earnings for the latest period.

## PLANT AVERAGES

Plant average hourly earnings, including premium overtime payments, varied from 44.2 cents paid in one of the medium-sized plants to \$1.047 in the case of the largest of the establishments studied. At one extreme, two of the plants studied showed averages below 65 cents per hour; in two others the figure was 90 cents or more.

The earnings of employees in the plants with fewer than 51 workers amounted to 59.8 cents per hour, as compared with 67.4 cents for workers in the two plants with 51 to 250 employees. The establishments which had 250 employees or more showed an average of 96.5

cents per hour. The apparent wage advantage of workers in the large plants was due in part to the greater relative importance of incentive methods of wage payment. No comparison of plant averages was made on a regional basis; the relatively small number of establishments studied made the computation of such averages inadvisable.

## OCCUPATIONAL DIFFERENCES IN EARNINGS

Average hourly earnings, exclusive of extra payments for overtime and night work, are available for 1,693 workers, who constituted the majority of the day-shift workers in the plants surveyed. For male employees, average earnings (excluding those of learners) ranged from 50.0 cents for class C bench assemblers to \$1.128 for class A machine operators (table 17). The general hourly average for all workers in the occupations studied in detail was 87.0 cents; the figure for male workers alone was 90.6 cents.

TABLE 17.—Average Hourly Earnings<sup>1</sup> of Day-Shift Workers in Selected Occupations in 8 Carbon-Products Plants, July-September 1942

Occupation and class	Number of workers	Average hourly earnings	Occupation and class	Number of workers	Average hourly earnings
Total workers.....	1,693	\$0.870	Male workers—Continued.		
Male workers.....	1,510	.906	Machine operators, all-round:		
Assemblers, bench, class B.....	5	( <sup>2</sup> )	Class A.....	16	\$1.128
Assemblers, bench, class C.....	16	.500	Class B.....	36	.999
Buffers.....	9	( <sup>2</sup> )	Millwrights, class A.....	21	1.052
Burrers.....	5	( <sup>2</sup> )	Millwrights, class B.....	24	.949
Carpenters, class B.....	6	.906	Packers.....	19	1.034
Compound mixers.....	54	1.042	Painters, dip.....	7	( <sup>2</sup> )
Crane operators.....	11	1.095	Platers.....	24	( <sup>2</sup> )
Craters, class B.....	20	.872	Riveting-machine operators.....	5	( <sup>2</sup> )
Craters, class C.....	5	( <sup>2</sup> )	Solderers, class C.....	10	( <sup>2</sup> )
Cutters, brush.....	46	.990	Stock clerks.....	20	.781
Drill-press operators, class B.....	11	.815	Testers, class A.....	10	( <sup>2</sup> )
Electricians, class A.....	9	1.033	Testers, class B.....	5	.825
Electricians, class B.....	19	1.007	Testers, class C.....	6	( <sup>2</sup> )
Electricians, class C.....	16	.863	Time clerks.....	24	.817
Extrusion-press operators.....	54	1.025	Truck drivers.....	16	.766
Firemen, stationary boiler.....	5	.949	Truckers, hand.....	26	.802
Foremen, working, class A.....	1	1.112	Truckers, power, inside.....	10	.889
Foremen, working, class B.....	13	.858	Watchmen.....	30	.794
Furnace and oven operators.....	73	1.024	Welders, hand, class B.....	6	.942
Grinders, brush.....	37	1.124	Winders, class A.....	5	( <sup>2</sup> )
Grinding-machine operators, class B.....	20	( <sup>2</sup> )	Winders, class C.....	24	.504
Helpers.....	86	.898	Female workers.....	183	.575
Inspectors, class A.....	11	( <sup>2</sup> )	Assemblers, bench, class B.....	5	( <sup>2</sup> )
Inspectors, class B.....	20	.902	Assemblers, bench, class C.....	36	.453
Inspectors, class C.....	58	.764	Inspectors, class C.....	23	.656
Janitors.....	36	.773	Learners, machine operators.....	5	( <sup>2</sup> )
Job setters.....	6	( <sup>2</sup> )	Loaders and unloaders, racks and conveyors.....	5	( <sup>2</sup> )
Laborers.....	275	.767	Packers.....	53	.699
Laborers, foundry.....	26	( <sup>2</sup> )	Punch-press operators.....	11	( <sup>2</sup> )
Lathe operators, engine:			Riveting-machine operators.....	12	.505
Class A.....	8	( <sup>2</sup> )	Tamper operators.....	9	( <sup>2</sup> )
Class B.....	11	.787	Testers, class C.....	16	( <sup>2</sup> )
Learners, journeyman and other.....	23	.788	Wirers, assembly, class C.....	8	( <sup>2</sup> )
Loaders and unloaders, racks and conveyors.....	121	.912			

<sup>1</sup> Averages are based on actual earnings exclusive of extra payments for overtime.

<sup>2</sup> Number of plants and/or workers too small to justify computation of an average.

Eleven occupational groups showed averages of \$1.00 or more per hour; these groups constituted about a fourth (24.1 percent) of all male employees. Of the male workers in the survey who were classified as skilled and semiskilled, more than two-fifths were in this rela-

tively high-wage group. The largest group which averaged \$1.00 or more was made up of 73 furnace and oven operators who, aside from laborers and loaders and unloaders, constituted the largest single occupational class in the group of plants studied. The two lowest-paid groups among male workers, class C bench assemblers and class C winders, showed averages of 50.0 cents and 50.4 cents per hour, respectively.

As is indicated above, somewhat less than a tenth (9.5 percent) of the employees in the industry are females; those studied in detail received average hourly earnings of 57.5 cents. The largest single occupational group of female employees studied were working as packers, and received average hourly rates of 69.9 cents. Other classifications in which substantial numbers of females were found were class C bench assemblers and class C inspectors; the lowest average for women, 45.3 cents per hour, was paid to class C bench assemblers.

A significant variation was found in the relationship between occupational earnings and the average number of workers employed per plant. For the 201 employees in plants with fewer than 250 workers, average hourly earnings were 55.9 cents, while the corresponding figure for the 1,492 wage earners in larger plants as a group was 89.4 cents (table 18). In many classifications the numbers of workers are insufficient to permit any reliable comparison of averages between plants of different size groups, and the occupational distributions in the large and small establishments are so dissimilar in some cases that comparable rates are difficult to compile. There are 13 occupational groups, however, in which the number of employees is believed to be adequate for this purpose. Without exception, the average hourly earnings in the large plants were higher than the corresponding figures for the small establishments. In only one case—class B working foremen—was the difference less than 15 cents; in six cases the averages were more than 25 cents higher in plants of the larger size group. These differences in average earnings are to some extent reflections of the greater extent of unionization and the larger use of incentive methods in the larger companies; there is, however, little doubt as to the substantial wage advantage of the workers in the larger plants.

TABLE 18.—Average Hourly Earnings<sup>1</sup> of Day-Shift Workers in 8 Carbon-Products Plants, by Occupation and Size of Plant, July–September 1942

Occupation and class	Average hourly earnings in plants employing—	
	250 workers or less	Over 250 workers
Number of workers <sup>2</sup> .....	201	1,492
Average hourly earnings <sup>2</sup> .....	\$0.559	\$0.894
Assemblers, bench, class C, female .....	\$0.368	\$0.621
Cutters, brush .....	.703	1.042
Foremen, working, class B .....	.822	.869
Furnace and oven operators .....	.775	1.038
Helpers, journeymen's .....	.650	.822
Inspectors, class B .....	.780	.932
Janitors .....	.513	.806
Laborers .....	.596	.770
Learners, journeyman .....	.418	.600
Millwrights, class A .....	.750	1.084
Stock clerks .....	.686	.832
Truck drivers .....	.570	.794
Watchmen .....	.583	.847

<sup>1</sup> Averages are based on actual earnings exclusive of extra payments for overtime.

<sup>2</sup> Includes workers in occupations not shown separately below.

## Chapter XVII.—EARNINGS IN THE MANUFACTURE OF ELECTRICAL APPLIANCES, 1942

### *Summary*

Twenty-two of the 27 plants included in this survey had converted to war production by the summer of 1942; of these 22 plants, half were devoting at least 90 percent of their output to war production. Employment increased about 27 percent between August 1939 and September 1942, an amount somewhat below that for many machinery and electrical industries during the same period. The increase between August 1939 and August 1941 was about 47 percent; however, there was a decrease of more than 13 percent during the following year, presumably as a result of the conversion order for the industry. Average hourly earnings (including overtime and shift premiums) rose from approximately 65 cents in August 1939 to 81 cents in the summer of 1942.

Average hourly earnings, exclusive of overtime premiums, are estimated at 76.9 cents during the late summer of 1942. Approximately 200 male workers in the occupations studied were classified in the seven groups which showed average hourly earnings in excess of \$1. In general, the larger plants paid higher wages.

### *Scope of Survey*

According to the Census of Manufactures there were, in 1939, 138 plants engaged primarily in the manufacture of domestic electrical appliances. Included in these establishments are plants manufacturing such products as electric fans, irons, mixers, percolators, hot plates, and vacuum cleaners.<sup>7</sup> The only important appliances excluded are domestic refrigerators and washing machines; manufacturers of such equipment are classified in separate industrial divisions. The 27 plants from which data were obtained by means of this survey constitute 25 percent of the 108 establishments which employed six or more workers during 1939; 30 plants employing five workers or less were excluded from the scope of the present survey. Most of the earnings data were for a representative pay-roll period during July 1942.<sup>8</sup>

### *Characteristics of the Industry*

#### GEOGRAPHIC DISTRIBUTION

Slightly more than one-half of the plants classified by the Bureau of the Census in this industry, in which nearly two-thirds of the workers in the industry were employed, are in the Midwest; over half of the 1939 labor force was in the States of Illinois and Ohio. One-third of the plants and almost one-third of the workers were found in the Northeastern States. Other plants, most of which were quite small, are in the Pacific Coast States; the few plants in the South were very small.

<sup>7</sup> This definition corresponds to that of Census Industry No. 1620.

<sup>8</sup> Pay-roll periods ending in June, August, or September were used for 4 plants.

## PRODUCTION OF WAR MATERIALS

No appreciable shift to defense production was reported for the 27 plants studied in this survey until 1941; only 1 plant was reported as devoting any of its facilities to the defense program as early as 1940 and it was producing indirect war materials. During 1941, slightly more than one-third of the plants were manufacturing either war materials or products with high priority ratings, although none of these was reported as devoting as much as 50 percent of facilities to the war program.

In 1942, all production of domestic electrical appliances was rigidly curtailed. All but 5 of the 27 plants studied were at least partially converted to war production at the time this study was made. Of the 22 plants engaged in war work, half were devoting at least 90 percent of their facilities to the war effort.

Although some production of electrical appliances on Government order still continued, the output of the plants at the time they were studied consisted principally of war materials. Articles were being produced as dissimilar from the usual output as ammunition boxes, gun canisters, screw-machine parts, mess kits, and marine hardware. Two large vacuum-cleaner plants closed down certain departments and expanded and converted their electric-motor divisions; both of these establishments were producing several varieties of motors which were more complex than the pre-war product and both had retrained employees formerly making the discontinued items. Among the striking conversions were from vacuum cleaners to portable field-lighting equipment, from electric table stoves to aircraft bombing accessories, and from electric fans to aerial bombs. Despite drastic changes in products, the plants surveyed found, for the most part, that their usual machinery was adaptable to the manufacture of war materials.

On the other hand, substantial readjustments were apparently necessary even on the part of some of the larger establishments. In nearly half of the 17 plants for which information is available, the total labor force at the time of the survey was about 30 percent below that in January 1942.

## THE LABOR FORCE

Approximately one-fifth of the male workers for whom detailed earnings data were compiled may be regarded as employed at skilled work; about one-half were employed on semiskilled and about one-third on unskilled jobs. The manufacture of electrical appliances does not involve large proportions of high-precision work, and many of the assembly operations are limited to simple bench work. Thus, the skill requirements of this industry tend to be somewhat lower than those of certain other industrial divisions.

This industry employed substantial numbers of women as factory workers even prior to the war. Slightly over 30 percent of the workers included in this survey were women; in fact, the only plants not employing at least a few female factory workers were five small establishments with fewer than 20 workers each. In two plants, women constituted over 80 percent of the labor force; in each of five other establishments, over half of the workers were women. By far the most important occupation among women was bench assembly work; the second most important was inspection. Substantial numbers of

women were also employed as rack and conveyor loaders, packers, product repairers, testers, winders, and wirers. Women were reported infrequently as machine operators except on drill presses and punch presses; in the operation of these machines women were employed in substantial numbers on lighter jobs. Among the females, the ratio of workers at unskilled work was even higher than that for males; approximately 80 percent of the women studied were employed at unskilled jobs.

The number of Negroes employed in the industry was negligible; only about one-fourth of 1 percent of the total employed in the 27 plants studied were Negroes. In fact, only 5 of the plants employed any Negroes and, in the plant employing the largest number, they constituted less than 2 percent of the factory labor force. Most of the Negroes reported in the industry were employed in foundry work or as janitors or truck drivers.

Nationally affiliated unions had working agreements with 11 of the plants studied; one additional plant had a contract with an independent union. Although some small plants had contracts with unions, such contracts were more prevalent among the larger establishments. In fact, only 3 of the 16 plants employing fewer than 100 workers were working under union agreements, as compared with 7 of the 11 larger establishments. Approximately 42 percent of the workers included in the survey were employed in organized shops.

Nine of the 11 collective agreements with nationally affiliated unions were with the members of the American Federation of Labor. Union strength in the industry was about evenly distributed between the North Central area and the Northeastern States; 4 of the 12 plants in the North Central region were unionized as compared with 3 of the 9 plants in the Northeast.

#### METHOD OF WAGE PAYMENT

Incentive systems of wage payment are common in the manufacture of electrical appliances; it is probable that this method of wage payment was even more prevalent, prior to the conversion to war production. Piece rates and bonus systems are, of course, readily adaptable to an industry which employs large numbers at the simple and repetitive machine and assembly work which characterizes the manufacture of small and standardized products.

Some type of incentive system of wage payment was reported for 12 of the 27 plants studied; these plants employed well over two-fifths of the workers included in the survey. In these 12 plants, 45 percent of the workers received pay at piece or bonus rates and the remainder were paid hourly rates. Incentive systems were in effect in small as well as large plants. Five of those included in the survey, and employing fewer than 100 workers each, used some incentive system of wage payment, and over 45 percent of all the workers employed in the plants of this size group were paid at incentive rates. For the industry as a whole, slightly less than 29 percent of the workers were paid under incentive systems.

All but 7 of the plants studied paid for overtime work under more liberal provisions than those required by Federal statute; these 7 firms employed fewer than 100 employees each. In 19 of the establishments, overtime was paid at the rate of time and a half for all work

over 8 hours in 1 day, and in 1 of these the double rate applied after 12 hours' work in the same day. The payment of overtime rates for work on Saturday was not so prevalent as in many other industries; only 7 plants paid overtime rates for Saturday work. In 4 plants, time and a half applied to all work on Saturday and in another the same rate was paid for the first 4 hours of work on that day, with double rates thereafter; in the sixth plant, time and a half was paid if Saturday was the sixth day of work in the week, and in the seventh plant the same premium rate was paid for the sixth day of work in any week. Payment for Sunday work was at the rate of time and one-half in 5 plants, at double rates in 6 other plants, and at double rates for work on the seventh day of work in any week in 2 plants. Payment for work on holidays was usually at the same overtime rates as for Sunday work; 5 plants paid time and a half and 6 paid double rates.

Compared with the other industries studied in connection with the survey of plants manufacturing machinery and electrical products, an unusually large proportion of the establishments manufacturing electrical appliances reported the operation of only a single shift. That there is some relation between the comparatively small proportion of plants engaging in multiple-shift operation and the decline in employment, as a result of the industry's shift to war production, seems apparent, however, from the fact that, in the plants which reported only one shift, employment declined over 10 percent between January 1942 and the time of the survey, while for those operating two or three shifts an increase of about 20 percent was reported.

TABLE 19.—*Wage Differentials for Second and Third Shifts in Electrical-Appliance Plants, July 1942*

Number of shifts worked	Number of plants	Differential paid for—	
		Second shift	Third shift
Plants with 1 shift only.....	18		
Plants with 2 shifts.....	2	5 cents per hour.....	
	1	8 cents per hour.....	
Plants with 3 shifts.....	1	No differential.....	No differential.
	1	½-hour paid lunch period.....	8 hours' pay for 7 hours' work, plus ½-hour paid lunch period.
	1	5 cents per hour.....	5 cents per hour.
	1	5 percent over base rate.....	5 percent over base rate.
	1	do.....	10 percent over base rate.
	1	10 percent over base rate.....	Do.

Two-thirds of the 27 plants studied in the industry operated on a single-shift basis (table 19). Of the remaining 9 plants, 3 operated two shifts and 6 were working three. With the exception of one plant, all paid some wage differential for work on the evening and night shifts. The most common shift differential reported was 5 cents above the base rate.

### *Employment, Hours, and Earnings*

#### TREND FROM 1939 TO 1942

Comparable data on employment, earnings, and hours are available from 20 plants for specified periods since the outbreak of the war (table 20). The number of persons employed in these 20 plants in-

creased about 27 percent, an amount somewhat below that for many machinery and electrical industries during the same period. The increase between August 1939 and August 1941 was about 47 percent, but there was a decrease of more than 13 percent during the following year, presumably as a result of the conversion order for the industry. The workweek, however, was lengthened during this later period, so that total man-hours worked decreased only about 3 percent during the year; over the 3-year period, man-hours increased nearly 50 percent.

TABLE 20.—*Employment, Average Hourly Earnings, and Average Weekly Hours of Workers in 20<sup>1</sup> Electrical-Appliance Plants, Specified Periods, 1939-42*

Year and month	Total number of wage earners <sup>2</sup>	Average hourly earnings	Estimated average hourly earnings exclusive of premium overtime payments	Average weekly hours
August 1939 .....	2,727	\$0.649	\$0.641	37.0
April 1940 .....	3,610	.715	.704	37.8
August 1940 .....	3,124	.651	.642	37.2
January 1941 .....	3,544	.686	.669	39.6
August 1941 .....	4,001	.706	.692	38.7
July 1942 .....	3,453	.811	.769	43.2

<sup>1</sup> The exclusion of 7 plants from these computations because complete data were not available is not believed to affect the validity of the trend comparisons for the industry.

<sup>2</sup> Data for 1 company used with reduced weight to avoid overrepresentation of large plants.

Average hourly earnings (exclusive of estimated extra payments for overtime) of the factory workers in these 20 plants rose from approximately 64 cents in August 1939 to nearly 77 cents in July 1942, an increase of 20 percent. Because of the lengthened workweek, however, and the consequent increase in premium overtime payments, average weekly earnings increased from approximately \$24 to slightly more than \$35, or more than 45 percent. The sharpest increase in earnings occurred during the last year of the period, when many of these plants had converted to war production.

#### PLANT AVERAGES

Although shift differentials and variations in the amounts of overtime pay may produce some distortion, general plant average earnings do indicate the approximate effect of certain plant characteristics on workers' earnings. Although some of the plants in both the Northeastern and North Central States pay average wages below 60 cents per hour, there is some indication from a study of relative plant averages that, compared with other sections of the country, a somewhat larger proportion of plants in the North Central area pay average wages of 85 cents or more per hour (table 21). However, geographic location does not appear to affect earnings to any great extent.

On the other hand, differences in size of plant do appear to be reflected in average earnings. Of the 15 plants employing fewer than 100 workers, only 8 showed averages of more than 60 cents per hour, and in only 3 were the averages above 85 cents. Of the 10 larger plants, none showed an average below 60 cents and 6 paid an average of more than 85 cents.

TABLE 21.—*Distribution of Electrical-Appliance Plants by Plant Average Hourly Earnings,<sup>1</sup> Region, and Size of Plant, July 1942*

Plant average hourly earnings	All plants <sup>2</sup>	Plants in—		Plants employing—	
		North-eastern States <sup>3</sup>	North Central States <sup>4</sup>	Less than 100 workers	100 or more workers
45.0 and under 50.0 cents	2	1	1	2	
50.0 and under 55.0 cents	3	1	1	3	
55.0 and under 60.0 cents	2	1	1	2	
60.0 and under 65.0 cents	1	1			1
65.0 and under 70.0 cents	4		4	2	2
70.0 and under 75.0 cents	1	1		1	
75.0 and under 80.0 cents	2	1		2	
80.0 and under 85.0 cents	1	1			1
85.0 and under 90.0 cents	5	1	2	1	4
90.0 and under 95.0 cents	3	1	2	2	1
95.0 cents or over	1		1		1
Total	25	9	12	15	10

<sup>1</sup> Includes premium payments for overtime and night work.

<sup>2</sup> Includes 3 Pacific and 1 South Central plants.

<sup>3</sup> Includes plants in Connecticut, Massachusetts, New Jersey, New York, and Pennsylvania.

<sup>4</sup> Includes plants in Illinois, Indiana, Michigan, and Ohio.

#### OCCUPATIONAL DIFFERENCES

Earnings data, excluding extra payments for overtime and night work, are available for 72 occupational groups of male workers (table 22). In only 7 of these occupational groups were average hourly earnings above \$1; these higher-paid occupations are class A working foremen, class A grinding-machine operators, class A screw-machine operators, class A sheet-metal workers, class A testers, tool and die makers, and class A hand welders. Moreover, for only 7 additional occupations were average earnings as high as 95 cents per hour.

In addition to apprentices and learners, 9 male occupational groups showed average hourly earnings below 70 cents. For all the male workers, average hourly earnings ranged from 52.5 cents for machine-operator learners to \$1.25 for class A working foremen.

Of the 22 occupational groups of female workers, only 4—class A and B bench assemblers, class B testers, and class B winders—showed average hourly earnings over 65 cents. In addition to learners, the average hourly earnings for 7 of the occupational groups were below 55 cents, and, for 3 of these occupations—class C drill-press operators, class C testers, and machine welders—the average earnings were less than 50 cents per hour.

The apparent anomaly in the averages shown for class A and B bench assemblers and for class B and C inspectors is the result, at least in part, of varying degrees of division of labor in large and small plants. In the larger establishments, there is a relatively greater division of labor in assembly and inspection work; consequently, proportionately fewer skilled workers are ordinarily employed. In the smaller establishments, however, such elaborate division of labor is not possible, and workers must possess a higher degree of skill in order to perform a larger number of operations. As a result, the smaller plants, even with their generally lower wage levels, employ more class A bench assemblers and class B inspectors while the larger shops, which tend to pay higher wages, hire a far greater proportion

of less-skilled assemblers and inspectors. In fact, only 3 plants reported the employment of class A bench assemblers and class B inspectors and each of these plants employed fewer than 100 workers.

TABLE 22.—Average Hourly Earnings,<sup>1</sup> of Day-Shift Workers in Selected Occupations in Electrical-Appliance Plants, July 1942

Occupation and class	Number of workers	Average hourly earnings	Occupation and class	Number of workers	Average hourly earnings
All workers.....	3,380	\$0.720	Male workers—Continued.		
Male workers.....	2,206	.805	Pipefitters.....	7	\$0.824
Acid dippers.....	13	.859	Platers.....	10	.862
Apprentices, first year.....	17	.595	Power-shear operators.....	21	.816
Apprentices, second year.....	11	.642	Punch-press operators:		
Assemblers, bench, class A.....	18	.940	Class B.....	51	.943
Assemblers, bench, class B.....	127	.809	Class C.....	68	.731
Assemblers, bench, class C.....	148	.633	Repairmen, machine.....	22	.885
Assemblers, floor, class B.....	13	.977	Repairmen, product.....	64	.720
Buffers.....	72	.902	Screw-machine operators:		
Carpenters, class A.....	6	.895	Class A.....	11	1.100
Carpenters, class B.....	19	.816	Class B.....	7	.807
Die setters.....	17	.880	Class C.....	11	.807
Drill-press operators:			Sheet-metal workers, class A.....	14	1.018
Class B.....	26	.816	Sheet-metal workers, class B.....	22	.823
Class C.....	16	.652	Solderers, class C.....	6	.733
Electricians, class A.....	6	.937	Stock clerks.....	110	.694
Electricians, class B.....	6	.862	Testers, class A.....	15	1.095
Electricians, class C.....	5	.724	Testers, class B.....	17	1.172
Firemen, stationary boiler.....	12	.895	Time clerks.....	58	.657
Foremen, working, class A.....	32	1.250	Tool and die makers.....	96	1.209
Foremen, working, class B.....	42	.965	Truck drivers.....	15	.826
Galvanizers.....	13	.933	Truckers, hand.....	86	.641
Grinding-machine operators:			Tumbler operators.....	5	.814
Class A.....	5	1.162	Watchmen.....	47	.623
Class B.....	34	.948	Welders, hand, class A.....	14	1.064
Helpers, machine operators.....	19	.685	Welders, hand, class B.....	19	.869
Helpers, other.....	15	.718	Welders, machine.....	139	.794
Inspectors, class A.....	15	.976	Winders.....	27	.829
Inspectors, class B.....	43	.812	Female workers.....	1,174	.562
Inspectors, class C.....	52	.742	Assemblers, bench:		
Janitors.....	57	.628	Class A.....	24	.669
Job setters.....	17	.907	Class B.....	81	.669
Laborers.....	64	.570	Class C.....	557	.550
Lathe operators, engine:			Drill-press operators:		
Class A.....	10	.946	Class B.....	7	.626
Class B.....	25	.778	Class C.....	14	.425
Lathe operators, turret:			Inspectors, class B.....	20	.532
Class A.....	6	.900	Inspectors, class C.....	96	.573
Class B.....	25	.797	Learners, other.....	20	.406
Learners, machine operator.....	5	.525	Loaders and unloaders, racks and conveyors.....	26	.545
Learners, other.....	23	.677	Packers.....	37	.564
Loaders and unloaders, racks and conveyors.....	44	.724	Punch-press operators, class C.....	55	.533
Machine operators, all-round:			Repairers, product, class B.....	14	.621
Class A.....	9	.973	Repairers, product, class C.....	50	.501
Class B.....	15	.817	Solderers, class C.....	6	.550
Machinists.....	12	.999	Testers, class B.....	6	.726
Milling-machine operators, class A.....	7	.949	Testers, class C.....	13	.494
Millwrights, class A.....	12	.958	Time clerks.....	7	.616
Millwrights, class B.....	6	.797	Welders, machine.....	5	.470
Packers.....	57	.781	Winders, class B.....	5	.690
Painters, spray.....	48	.866	Winders, class C.....	75	.563
			Wirers, assembly, class C.....	53	.583

<sup>1</sup> Averages are based on earnings exclusive of premium payments for overtime.

Workers in plants with fewer than 100 employees consistently received lower average earnings than those employed in larger plants. In each of the 8 most important (numerically) occupations in the industry the employees of the larger plants received higher average earnings (table 23). Among the occupations for male workers the

wage differences ranged from 7.5 cents for stock clerks to 29.6 cents per hour for class C punch-press operators. Among female workers the differences ranged from 12.3 cents for packers to 21.3 cents for class C assembly wirers. If comparisons are limited to production workers, the difference for each occupation was over 10 cents per hour.

TABLE 23.—Average Hourly Earnings<sup>1</sup> of Day-Shift Workers in Electrical-Appliance Plants, by Occupation and Size of Plant, July 1942

Occupation and class	Plants employing—			
	100 workers or less		Over 100 workers	
	Number of workers	Average hourly earnings	Number of workers	Average hourly earnings
Male workers:				
Assemblers, bench, class C.....	12	\$0.530	136	\$0.642
Buffers.....	16	.858	56	1.031
Laborers.....	10	.448	54	.592
Punch-press operators, class C.....	11	.483	57	.779
Stock clerks.....	17	.631	93	.706
Female workers:				
Assemblers, bench, class C.....	114	.444	443	.577
Packers.....	15	.491	22	.614
Wirers, assembly, class C.....	17	.435	39	.648

<sup>1</sup> Averages are based on earnings exclusive of premium payments for overtime.

When the output of most electrical appliances ceased, a considerable modification in occupational patterns occurred with the shift to war production. One plant reported that with the assignment to new and unfamiliar work the earnings of incentive workers declined, and as a result, a general job revaluation and piece-rate increases were necessary. In another instance, with a change from routine assembly work to job production, all female employees (about half of all workers) were laid off. Another plant retrained its employees for new tasks, but in this establishment the incentive workers as a group were unable to exceed their guaranteed piece-work rates.