

UNITED STATES DEPARTMENT OF LABOR

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BUREAU OF LABOR STATISTICS

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# Wages in the Nonferrous-Metals Industry, June 1943

Prepared by the  
DIVISION OF WAGE ANALYSIS  
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*Bulletin No. 765*

[Reprinted from the *Monthly Labor Review*,  
November and December 1943, with additional data]

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## Letter of Transmittal

UNITED STATES DEPARTMENT OF LABOR,  
BUREAU OF LABOR STATISTICS,  
Washington, D. C., February 14, 1944.

The SECRETARY OF LABOR:

I have the honor to transmit herewith a report on wages in the nonferrous-metals industry, June 1943. The report was prepared by Edith M. Olsen under the direction of Victor S. Baril, of the Division of Wage Analysis.

A. F. HINRICHS, *Acting Commissioner.*

Hon. FRANCES PERKINS,  
*Secretary of Labor.*



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United States Bureau of Labor Statistics*

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**Wages in the Nonferrous-Metals Industry, June 1943**

*Summary*

A recent survey of the Bureau of Labor Statistics reveals that straight-time average earnings for workers in selected occupations in nonferrous-metal mines and mills ranged, in June 1943, from 64.5 cents an hour for pitmen to \$1.311 an hour for power-shovel operators. Workers in 18 occupations, accounting for somewhat more than one-half of the total workers studied, had average earnings ranging from 85 cents to \$1.00 an hour.

Fully half of all the workers covered in primary smelting establishments were in occupations for which the average earnings were between 85 cents and \$1.00 an hour and more than one-fourth were in occupations for which earnings exceeded \$1.00 an hour. In each of the three types of smelters for which figures are shown, workers tended to concentrate at somewhat different wage levels. For example, somewhat more than half of the workers in the copper smelters were in occupations with average hourly earnings ranging from 80 to 95 cents; slightly over three-fifths of the workers in lead smelters were employed in occupations with average hourly earnings between 80 and 90 cents an hour; and more than half of the workers studied in zinc smelters were in occupations in which average hourly earnings ranged from 85 cents to \$1.00 an hour.

In primary refining establishments, more than two-thirds of the workers studied were in occupations having average hourly earnings of 85 cents to \$1.00 an hour. In electrolytic copper refineries, more than three-fifths of the workers were in occupational groups whose average hourly earnings ranged from 85 cents to \$1.00 an hour, while in the electrolytic production of zinc nearly three-fourths of the workers were in occupations with average hourly earnings ranging from 90 cents to \$1.00 an hour.

Average hourly earnings for workers in selected occupations in secondary smelters ranged from 63.8 cents an hour for watchmen to \$1.178 an hour for class A machinists. Blast-furnace and reverberatory furnace operators, and furnace operators' helpers, together accounted for fully two-fifths of all the workers studied, and were paid average

hourly earnings of 88.6 and 79.9 cents an hour. Average hourly earnings of more than \$1.00 an hour were paid only to workers in some of the maintenance occupations.

Average hourly earnings in the mining, milling, smelting, and refining branches of the nonferrous-metals industry were substantially higher in June 1943 than in August 1941, the date of the Bureau's earlier survey of the industry. For workers engaged in mining and milling establishments, gross average hourly earnings, which include premium payments for overtime work, rose approximately 28 percent. In the nonferrous primary smelting and refining industry as a whole, gross average hourly earnings increased nearly 26 percent.

### *The Industry in Wartime*

Nonferrous metals are of critical importance in the manufacture of the weapons and implements required for present-day mechanized warfare. Either in pure form or in combination with other metals, they are found in practically all types of fighting equipment—planes, guns, ships, transportation and communication equipment, and innumerable other essential items. In terms of volume, copper, lead and zinc are the three most important nonferrous metals. Many other nonferrous metals, such as vanadium, molybdenum, tungsten, and manganese, although not consumed in such great quantities as these three, are nevertheless of critical importance, particularly in the production of alloy steels.

With the entry of the United States into the present war, the nonferrous-metals industry was called upon to produce in unprecedented volume in order to keep the Nation's manufacturing plants supplied with enough raw materials to meet production goals. It was clear that war demands would strain the capacity of the entire industry, but particularly of the mining branch, since a decline in the grade of ore was faced in some areas. The shortage of urgently needed materials made it imperative for the Federal Government to stimulate an increase in the production of ore from every known deposit and to aid in the location and development of new sources of supply.

The program undertaken to stimulate the production of these vital metals has been many-sided. The U. S. Bureau of Mines and the U. S. Geological Survey of the Department of the Interior have intensified their efforts to discover new ore deposits. The War Production Board has assisted producers by granting high priority ratings on mining equipment and supplies, and has offered aid in the building of roads to hitherto inaccessible mining areas. Under certain conditions and restrictions financial assistance in the development of mining projects has been made available through the Reconstruction Finance Corporation. As a further incentive to mine operators to increase the output of copper, lead, and zinc, the Metals Reserve Co., established by the Federal Government, announced the payment of premium prices on all overquota production of these metals.<sup>1</sup> The "Premium Price Plan" became effective on February 1, 1942, and is to operate until July 31, 1944.

*Manpower problem.*—Undoubtedly the most critical problem related to increasing, or even maintaining, the level of production is the drastic shortage of labor facing the industry. This manpower

<sup>1</sup> See Office of Price Administration Release No. PM 2458, February 9, 1942.

shortage is most serious in the mines. Whereas practically all mining areas have been in need of additional workers, the trend of employment has actually tended downward. The relatively strenuous and hazardous nature of the work, particularly in underground operations, makes employment in the mines generally unattractive. Furthermore, mining and milling operations are typically situated in isolated communities in which housing and other facilities are limited. It has been difficult, therefore, to replace the workers who have been lost to other industries or to the armed forces.

Several agencies of the Government have cooperated in an effort to alleviate the shortage of labor in the industry. On September 7, 1942, the War Manpower Commission, in an attempt to stabilize employment, placed limitations upon the movement of men away from the mines. In October of the same year, the major gold mines were ordered by the War Production Board to cease operations, in order to free their miners for work in essential nonferrous-metal mines. Also in the fall of 1942, the War Department authorized the furloughing from the Army, for a period of 6 months, of 4,000 men who had formerly been employed in the mines and who were willing to resume mining jobs. Although this plan was not entirely successful in the first attempt, the War Department announced a new program in July 1943 for releasing 4,500 additional skilled miners from the Army; only mines of high potential productivity, which are in areas where the labor shortage is critical, will benefit from this program. The Selective Service is granting occupational deferment to essential nonferrous-metal workers in some localities.

*Wage-stabilization program.*—As part of the combined effort by Federal agencies to solve the labor-shortage problem in the nonferrous-metals industry, the National War Labor Board has granted a number of wage increases in the industry. One of the early decisions of the Board resulted in a substantial general wage increase for workers in the copper operations in Michigan. On October 16, 1942, an increase of \$1.00 a day was granted to 10,000 copper, lead, and zinc workers in Idaho and Utah.<sup>2</sup> Simultaneous with this action was the establishment by the Board of a Nonferrous Metals Commission to stabilize wages and labor relations in the industry as a whole.<sup>3</sup> Extending the industry-wide stabilization program begun in Utah and Idaho, the Commission has granted wage increases in certain areas where higher rates were needed to maintain a sufficient labor force. On August 15, 1943, workers in 5 plants in the Tri-State lead and zinc producing area were granted a 50-cent general wage increase per shift;<sup>4</sup> the local Board was authorized to approve such adjustments in the earnings of other workers in the Tri-State District as are needed to stabilize the wages of the industry in that locality.

Partly as a result of these and other increases, average hourly earnings in the mining and milling of nonferrous metals rose from 74.5 cents in January 1941 to \$1.00 in June 1943, or by about 34 percent. Eliminating the influence of increased overtime work at premium rates, the increase was about 29 percent.

<sup>2</sup> National War Labor Board, Release No. B-251, October 16, 1942.

<sup>3</sup> Idem, Release No. B-329, November 29, 1942.

<sup>4</sup> Idem, Release No. B-889, August 15, 1943.

*Nature of Data Collected*

These earnings data were obtained in a nation-wide survey of wages in the nonferrous-metals industry, conducted by the Bureau of Labor Statistics during the summer of 1943 at the request of the Nonferrous Metals Commission of the National War Labor Board. The principal purpose of the survey was to provide current basic wage data to aid in the stabilization of wages in the industry. The study covered two broad segments of the industry—mining and milling, and smelting and refining; it included establishments engaged in the mining or processing of all nonferrous metals other than the precious metals.<sup>5</sup> Plants engaged in the fabrication of nonferrous metals were not included in the survey.

The data obtained in this study were collected by trained field representatives of the Bureau, who visited the individual establishments and transcribed the information directly from pay-roll and other plant records. Average hourly earnings, excluding premium payments for overtime and late-shift work, were obtained for all workers in selected key occupations. Standard job descriptions were used by the field representatives in classifying the workers by occupation, in order to insure the greatest possible comparability between jobs in all of the plants studied. The wage data are for typical pay-roll periods in June 1943.

Although the occupational wage data comprise the greater part of the information secured during the course of the survey, it was necessary also to obtain such other items of information as would facilitate the interpretation of these wage data, as, for example, the daily hours of work, overtime-payment practices, number of shifts operated and shift-differential policies. In addition, data were obtained on the method of wage payment for workers within each occupation, entrance rates paid to male common labor, and the extent of unionization.

<sup>5</sup> An earlier study of the wage structure of the nonferrous-metals industry was conducted by the Bureau in the fall of 1941. This study included the mining, milling, smelting, refining, and primary fabrication of nonferrous metals. In the summer of 1942, the wage data for mining and milling, smelting, and refining, were brought up to date (see U. S. Bureau of Labor Statistics Bulletin No. 729: *Wage Structure of the Nonferrous-Metals Industry, 1941-42*).

## PART I.—*Mining and Milling*

### SCOPE AND METHOD OF SURVEY

The study of the mining and milling division of the industry covered the extraction and milling of copper, lead, and zinc ores and, in addition, certain other nonferrous-metal ores, such as mercury, bauxite, molybdenum, tungsten, and manganese, which are of less importance from the standpoint of volume of production and employment. All of the mining establishments included were engaged primarily in the actual extraction of ore, from either surface or underground mines; establishments in which exploration, prospecting or development activities constituted the major part of the work were not included. In many cases, two or more of the mines studied in a given locality were operated by one company. The milling establishments were engaged in the crushing of crude ore and, in many of the mills, in eliminating waste material from the ores. A large number of the mills studied were found to be operated in conjunction with individual mines, but central milling (i. e., where the ore from several properties is processed at one central mill) is also widely practiced in the industry.

Although copper-bearing ore is mined to some extent in 18 of the 48 States, practically all copper production is centered in the States of Arizona, Michigan, Montana, Nevada, New Mexico, and Utah. In 1942, according to Bureau of Mines reports, these six States accounted for all but 3 percent of the total production; the three States of Arizona, Utah, and Montana accounted for 78 percent of the total production.

The greater part of the lead-zinc ore extraction is carried on in nine States: Arizona, Colorado, Idaho, Kansas, Missouri, Montana, New Mexico, Oklahoma, and Utah. The Tri-State Area, which occupies parts of four contiguous counties in Missouri, Oklahoma, and Kansas, is the oldest and still the principal zinc-producing area in the United States. In 1942 this area alone accounted for over 30 percent of the total domestic zinc production, and for about 7 percent of the entire lead output. Both lead and zinc are found in most of the Western and Central States. Significant deposits of zinc are also located in New Jersey, New York, Tennessee, and Virginia.

Most of the mercury produced in the United States comes from mines in California and Oregon, while about three-fourths of this country's supply of molybdenum originates in Colorado. Tungsten deposits are found chiefly in California and Nevada, and in small quantities in Colorado, Arizona, and Idaho. In the production of vanadium, Colorado ranks first, with smaller amounts coming from Arizona, Idaho, and Utah. Manganese ores are found in a number of States, the larger deposits being in Montana.

Throughout most regions, the survey covered virtually all of the mines and mills employing 9 or more workers. In a few States, however, where the concentration of the industry was great, a representative sample of the mines and mills was selected, consideration being given to size and type of establishment, location, and corporate affiliation. Such sampled data have been properly weighted in order to assure appropriate representation of all areas.

The scope of the survey of wages in mining and milling operations is indicated in table 1, which shows by region the number of workers for whom detailed occupational wage data were obtained and the number of workers for whom figures are presented, i. e., the weighted employment figures. The survey actually covered 326 mines and 177 mills, operated by 241 separate companies. The weighted employment figures relate to approximately 670 mines and mills.

TABLE 1.—Number of Workers in Mines and Mills Represented by Bureau's Survey, June 1943

Branch and region <sup>1</sup>	Number of workers actually scheduled	Number of workers actually used	Branch and region <sup>1</sup>	Number of workers actually scheduled	Number of workers actually used
All regions.....	35,424	41,271			
Copper mines.....	16,486	16,486	Lead and zinc mills.....	1,685	2,609
Pacific.....	299	299	Northwest.....	480	622
Northwest.....	8,075	8,075	Southwest.....	180	180
Southwest.....	5,638	5,638	Midwest.....	689	1,471
Midwest.....	2,080	2,080	Northeast.....	219	219
Southeast.....	394	394	Southeast.....	117	117
Copper mills.....	1,638	1,638	Other mines.....	4,875	5,245
Pacific.....	79	79	Pacific.....	748	748
Northwest.....	847	847	Northwest.....	2,289	2,633
Southwest.....	469	469	Southwest.....	327	327
Midwest.....	221	221	Midwest.....	1,369	1,369
Southeast.....	22	22	Southeast.....	142	168
Lead and zinc mines.....	9,827	14,321	Other mills.....	913	972
Pacific.....	78	78	Pacific.....	114	114
Northwest.....	4,087	5,757	Northwest.....	696	755
Southwest.....	1,393	1,393	Southwest.....	17	17
Midwest.....	2,945	5,769	Midwest.....	86	86
Northeast.....	618	618			
Southeast.....	706	706			

<sup>1</sup> The Pacific region includes California, Oregon, and northwest Washington; the Northwest includes Idaho, Montana, Colorado, Nevada, Utah, and northeast Washington; the Southwest includes Arizona, New Mexico, and Texas; the Midwest includes Wisconsin, Missouri, Arkansas, Michigan, Kansas, and Oklahoma; the Northeast includes New York and New Jersey; the Southeast includes Alabama, Georgia, North Carolina, Tennessee, and Virginia.

The detailed earnings presented in the following pages are for selected occupations, representing 41,271 workers of whom 36,052 were employed in mines and 5,219 in mills. Total employment in these operations (i. e., mines and mills employing 9 or more workers) is estimated at 72,000. Copper, lead, and zinc producing operations employed approximately 85 percent of all the workers studied. The Northwest region accounted for 45 percent of the workers, the Southwest for 19 percent, and the Midwest for 27 percent. The combined employment of the Pacific, the Northeast, and the Southeast regions accounted for but 9 percent of the total number of workers studied.

#### THE LABOR FORCE

With the exception of office employees, the labor force employed in the mining of nonferrous metals was composed exclusively of male workers; in the mills covered by the survey, only 25 women were employed in the occupations studied. The average hourly earnings of the few woman workers were somewhat below the averages paid to male workers in the same occupations.

*Unionization.*—Union agreements were in effect in 106 of the 326 mines and in 63 of the 177 mills actually covered in the Bureau's survey. The union establishments employed over 53 percent of all the workers studied. Negotiations with unions were in progress in several additional establishments, some of which have since signed union agreements. At the time of the survey, most of the organized mine and mill workers were represented by the International Union of Mine, Mill and Smelter Workers, affiliated with the C. I. O. A small percentage of the workers belonged to A. F. of L. unions and to independent labor organizations. The extent of unionization varied considerably between regions. In the Western States nearly 60 percent of the workers were employed in union plants, while in the Tri-State lead and zinc mines and mills only 23 percent of the workers were employed in union establishments.

#### WAGE-PAYMENT PRACTICES

Mine and mill workers are paid predominantly on a time basis; in most cases time workers are paid by the day. In the mines studied, 76.5 percent of all the workers studied were time workers and 23.5 percent were incentive workers. Incentive methods of pay were limited to relatively few of the occupations. Muckers in many of the mines studied were paid on a piece-rate basis. Bonus plans, under which the workers receive a guaranteed minimum rate plus a bonus for output in excess of an established production quota, were used in compensating workers in certain other mining occupations—for example, drilling-machine operators, loading-machine operators, and cagers.

Payment by the hour or day is particularly common in the mills. All of the employees in copper mills and all but 2.3 percent of those in lead and zinc mills were time workers.

Multiple-shift operations were reported by the majority of the companies included in the survey, but only approximately 25 percent of the workers in the mines and mills were employed on the second shift, and only approximately 10 percent on the third shift. The payment of shift differentials is not common practice in nonferrous mining and milling. Premium pay to workers on second and third shifts was reported by only 3 of the 241 companies studied. Periodic rotation of shifts was practiced in well over one-half of the operations studied.

Employees in each of the 241 companies were paid at the rate of time and a half for all work above 40 hours a week; 91 companies also paid this overtime rate for hours worked in excess of 8 a day, which was the length of the normal workday in most of the establishments surveyed. Holiday work was paid for by 106 companies at the rate of time and a half, and by 9 companies at double time.

Fifty-five of the 241 companies paid special wage differentials to workers in hazardous occupations. These differentials were most commonly paid to shaft sinkers and shaft repairmen and to employees exposed to wet and particularly unpleasant conditions of work. The wage premiums paid to workers in these occupations were typically between 25 cents and 50 cents a day, although several companies paid a differential of \$1.00 a day for shaft-repair work.

## ENTRANCE RATES FOR MALE COMMON LABOR

Of the 503 mines and mills actually covered in the survey, 426 reported established entrance rates for male common labor. These rates ranged from 30 cents to \$1.03 an hour, the extreme range resulting largely from regional differences in general wage levels. Nearly all of the establishments included in the Southeast region paid entrance rates to common labor of 50 cents an hour or less, whereas in the Pacific region, the lowest rate reported for such workers was 68.8 cents an hour. Nearly two-thirds of the establishments reported entrance rates of between 60 and 85 cents an hour, the largest concentration being within the narrow range from 70 to 75 cents.

## STRAIGHT-TIME AVERAGE HOURLY EARNINGS, BY OCCUPATION

The detailed occupational wage data for all nonferrous mines and mills studied in the survey are presented in table 2. Because of the small number of operations producing the metals found in the Southeast and Pacific regions, combined earnings data are shown for all nonferrous mines and mills in each of these two regions. The number of workers and straight-time average hourly earnings are shown for 44 selected occupational groups in underground and open-pit mines and in the mills processing the ore. The occupations are classified in table 2 by type of operation. Thus, all processing operations are shown separately for underground mines, for open-pit (surface) mines, and for mills.

Many of the larger companies submitted combined reports for several operations in a given locality; it was not possible, therefore, to indicate the number of mines and mills represented in each occupational average shown. Companies operating a mill and one or more mines on the same property often employ only one custodial and one maintenance crew to service all divisions of the operation. In such cases no attempt was made to prorate these workers for the purpose of presenting earnings data separately for mines and mills; the average hourly earnings shown in table 2 for other than processing occupations therefore relate to both the mining and the milling operations.

Earnings data for underground workers represent earnings for total time in the mine, including travel time to and from the face or place of work in the mine. Where the underground workers were given a formal lunch period and allowed to leave their place of work in the mine and were not subject to call during this period, the time spent for such lunch periods has not been considered as time worked, and is not reflected in the earnings shown. In many of the mines, however, the workers were given no formal lunch period, but ate on the job. In such cases, the time spent for lunch was considered as part of the workday.

For the country as a whole, straight-time average hourly earnings for the 41,271 workers covered in the study ranged from 64.5 cents an hour for pitmen to \$1.311 an hour for operators of large power shovels in surface or open-pit mines. Nearly three-tenths of the workers were found in the 10 occupations for which the average hourly earnings exceeded \$1.00 an hour, and more than half (52.8 percent) of the workers were in the 18 occupations for which average earnings ranged from 85 cents to \$1.00 an hour. Slightly more than 11 percent of all the

workers studied were in occupations with earnings of less than 80 cents an hour. Three occupations, production drilling-machine operators, all-round miners, and muckers, together accounted for 42.8 percent of all the workers; average hourly earnings for workers in these three occupations were 91.2 cents, \$1.049, and 89.7 cents an hour, respectively.

TABLE 2.—Straight-Time Average Hourly Earnings of Workers in Selected Occu

Occupation	United States total: All metals		Pacific		Northwest					
			All metals		All metals		Lead and zinc		Copper	
	Number of workers	Average hourly earnings	Number of workers	Average hourly earnings	Number of workers	Average hourly earnings	Number of workers	Average hourly earnings	Number of workers	Average hourly earnings
<b>Maintenance:</b>										
Blacksmiths.....	438	\$0.930	25	\$1.044	186	\$1.018	80	\$0.997	72	\$1.067
Carpenters, class A.....	641	1.023	24	1.306	354	1.070	69	1.062	204	1.060
Carpenters, class B.....	284	.834	23	.917	96	.903	32	.928	20	.957
Electricians, class A.....	504	1.059	13	1.181	302	1.100	55	1.099	206	1.067
Electricians, class B.....	271	.905	7	.947	120	.981	34	1.055	61	.984
Machinists, class A.....	467	1.059	13	1.215	316	1.079	60	1.104	244	1.062
Machinists, class B.....	405	.870	17	1.120	98	.985	34	1.016	52	.973
Maintenance men, general.....	988	.964	23	.949	349	1.011	187	1.063	-----	-----
<b>Supervision:</b>										
Working foremen, processing departments.....	1,163	1.026	56	1.270	357	1.089	192	1.121	33	1.138
<b>Processing—mining (underground):</b>										
Cagers, inside.....	757	.933	26	.907	295	1.010	102	1.026	158	1.031
Drilling-machine operators, production.....	4,087	.912	31	1.096	1,300	1.009	889	1.036	132	1.077
Drilling-machine operators, special.....	734	1.093	10	1.028	123	1.129	97	1.124	16	1.261
Loading-machine operators.....	826	.929	13	.959	276	.979	166	1.018	22	.988
Miners, all-round.....	7,708	1.049	433	1.065	5,345	1.076	892	1.013	3,949	1.094
Muckers.....	5,911	.897	245	.915	1,984	.908	1,206	.947	134	.975
Pumpmen.....	484	.902	8	.836	231	1.041	68	1.029	143	1.067
Timbermen.....	2,977	.981	49	.988	1,846	1.000	972	1.033	788	.975
Trackmen, inside.....	704	.849	5	1.003	111	.945	68	.982	14	.960
<b>Processing—mining (surface):</b>										
Drilling-machine operators.....	422	.908	12	.838	151	1.047	-----	-----	69	.987
Pitmen.....	308	.645	-----	-----	88	.834	-----	-----	62	( <sup>1</sup> )
Power-shovel operators, capacity—	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Under 5 cubic yards.....	184	1.138	13	.974	39	1.256	-----	-----	4	1.252
5 cubic yards and over.....	104	1.311	-----	-----	49	1.276	-----	-----	49	1.276
Trackmen, surface.....	1,133	.702	1	( <sup>1</sup> )	580	.766	-----	-----	580	.786
<b>Processing—milling:</b>										
Ball-mill operators.....	383	.871	10	1.032	212	.902	68	.886	87	.930
Crusher operators.....	632	.810	39	.881	219	.882	33	.867	31	.944
Filter operators.....	169	.827	6	1.014	90	.880	26	.910	22	.920
Flotation operators.....	633	.901	24	.985	284	.967	137	.980	113	.952
Helpers, processing machines.....	961	.793	33	.861	427	.869	115	.889	169	.912
Jig operators.....	349	.818	3	( <sup>1</sup> )	20	.840	3	( <sup>1</sup> )	-----	-----
<b>Inspection and testing:</b>										
Samplers, ore.....	128	.860	5	1.068	42	1.049	12	.956	19	.948
Samplers.....	216	.824	7	.920	116	.854	10	.638	74	.909
<b>Recording and control:</b>										
Timekeepers.....	171	1.012	4	.800	95	1.106	6	.893	82	1.134
<b>Material movement:</b>										
Conveyor operators.....	181	.845	3	( <sup>1</sup> )	91	.927	9	.993	79	.923
Hoistmen.....	1,179	.927	34	.915	449	1.047	196	1.046	178	1.113
Locomotive engineers.....	281	1.006	-----	-----	149	1.031	-----	-----	149	1.031
Locomotive firemen.....	50	.845	-----	-----	24	.874	-----	-----	24	.874
Motormen, inside.....	1,422	.947	7	1.138	921	.963	224	.989	635	.969
Tractor operators.....	307	.939	4	.903	41	1.168	-----	-----	15	1.044
Trammers.....	972	.782	20	.883	224	.867	168	.901	7	.838
Truck drivers.....	316	.838	23	.886	144	.909	31	.896	21	.945
Truck operators, capacity—	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Under 10-ton.....	372	.735	27	.814	90	.835	-----	-----	6	.770
10-ton and over.....	203	.960	8	( <sup>1</sup> )	84	1.058	-----	-----	-----	-----
<b>Custodial:</b>										
Change-house men.....	177	.782	7	.865	82	.853	17	.928	52	.852
Watchmen.....	699	.747	7	.816	289	.844	91	.895	152	.863

<sup>1</sup> Too few workers and/or plants to warrant computation of an average.

Operations in Nonferrous-Metal Mines and Mills, by Region and Metal, June 1943

Northwest—Continued		Southwest								Occupation
Other metals		All metals		Lead and zinc		Copper		Other metals		
Number of workers	Average hourly earnings	Number of workers	Average hourly earnings	Number of workers	Average hourly earnings	Number of workers	Average hourly earnings	Number of workers	Average hourly earnings	
34	\$0.962	47	\$0.920	15	\$0.881	25	\$0.964	7	\$0.849	
81	1.085	117	.993	17	.900	99	1.008	1	( <sup>1</sup> )	
44	.862	12	.931	6	.892	6	( <sup>1</sup> )	2	( <sup>1</sup> )	
41	1.272	103	1.006	8	.975	93	1.011	2	( <sup>1</sup> )	
25	.874	26	.925	3	.862	23	.933	-----	-----	
22	1.205	51	1.019	6	.933	45	1.030	-----	-----	
12	.948	29	.992	6	.866	23	1.025	-----	-----	
162	.952	330	.999	13	.863	314	1.006	3	.787	
132	1.030	341	.991	35	.960	292	1.001	14	.851	
35	.874	130	.932	28	.830	98	.977	4	.561	
279	.894	269	.803	180	.819	53	.906	36	.555	
10	.970	235	1.261	41	1.013	190	1.327	4	.675	
88	.901	48	.887	32	.853	15	.973	1	( <sup>1</sup> )	
504	1.045	1,717	.983	290	.893	1,341	1.021	86	.631	
644	.821	1,324	.843	398	.735	818	.941	108	.501	
20	.967	76	.806	20	.817	48	.876	8	.362	
91	.871	671	1.045	86	.879	582	1.072	3	( <sup>1</sup> )	
29	.860	70	.975	8	.871	62	.989	-----	-----	
82	1.099	155	.906	-----	-----	151	.906	4	( <sup>1</sup> )	
26	.930	65	.742	-----	-----	63	.739	2	( <sup>1</sup> )	
35	1.256	55	1.309	-----	-----	52	1.279	3	( <sup>1</sup> )	
-----	-----	19	1.321	-----	-----	19	1.321	-----	-----	
-----	-----	493	.639	-----	-----	493	.639	-----	-----	
57	.880	112	.840	27	.765	85	.864	-----	-----	
105	.877	84	.759	25	.722	56	.794	3	.413	
42	.840	36	.741	14	.666	17	.863	5	.536	
34	.965	115	.858	35	.861	80	.856	-----	-----	
143	.802	107	.716	35	.707	70	.724	2	( <sup>1</sup> )	
17	.824	2	( <sup>1</sup> )	2	( <sup>1</sup> )	-----	-----	-----	-----	
11	1.323	51	.768	1	( <sup>1</sup> )	49	.768	1	( <sup>1</sup> )	
32	.793	28	.839	4	.675	24	.806	-----	-----	
7	.962	46	.940	2	( <sup>1</sup> )	43	.957	1	( <sup>1</sup> )	
3	.825	20	.775	-----	-----	20	.775	-----	-----	
75	.891	197	.932	80	.842	99	1.059	18	.642	
-----	-----	106	.997	-----	-----	106	.997	-----	-----	
-----	-----	26	.818	-----	-----	26	.818	-----	-----	
62	.808	159	.952	24	.786	160	.983	5	.736	
26	1.239	45	.993	-----	-----	45	.993	-----	-----	
59	.777	145	.715	91	.757	48	.664	6	.484	
92	.905	33	.814	14	.789	17	.884	2	( <sup>1</sup> )	
84	.840	72	.902	-----	-----	63	.886	9	1.012	
84	1.058	27	1.021	-----	-----	27	1.021	-----	-----	
13	.763	43	.737	6	.702	37	.743	-----	-----	
46	.682	157	.777	21	.608	130	.820	6	.433	

Maintenance:  
 Blacksmiths.  
 Carpenters, class A.  
 Carpenters, class B.  
 Electricians, class A.  
 Electricians, class B.  
 Machinists, class A.  
 Machinists, class B.  
 Maintenance men, general.

Supervision:  
 Working foremen, processing departments.

Processing—mining (underground):  
 Cagers, inside.  
 Drilling-machine operators, production.  
 Drilling-machine operators, special.  
 Loading-machine operators.  
 Miners, all-round.  
 Muckers.  
 Pump men.  
 Timbermen.  
 Trackmen, inside.

Processing—mining (surface):  
 Drilling-machine operators.  
 Pitmen.  
 Power-shovel operators, capacity—  
 Under 5 cubic yards.  
 5 cubic yards and over.  
 Trackmen, surface.

Processing—milling:  
 Ball-mill operators.  
 Crusher operators.  
 Filter operators.  
 Flotation operators.  
 Helpers, processing machines.  
 Jig operators.

Inspection and testing:  
 Samplers, ore.  
 Samplers.

Recording and control:  
 Timekeepers.

Material movement:  
 Conveyor operators.  
 Hoistmen.  
 Locomotive engineers.  
 Locomotive firemen.  
 Motormen, inside.  
 Tractor operators.  
 Trammers.  
 Truck drivers.  
 Truck operators, capacity—  
 Under 10-ton.  
 10-ton and over.

Custodial:  
 Change-house men.  
 Watchmen.

TABLE 2.—Straight-Time Average Hourly Earnings of Workers in Selected Occupa

Occupation	Midwest							
	All metals		Copper		Lead and zinc		Tri-State: Lead and zinc	
	Num- ber of work- ers	Aver- age hour- ly earn- ings						
<b>Maintenance:</b>								
Blacksmiths.....	147	\$0.818	34	\$0.717	101	\$0.863	84	\$0.863
Carpenters, class A.....	129	.871			115	.869	78	.890
Carpenters, class B.....	125	.778	31	.718	85	.810	63	.830
Electricians, class A.....	62	.944			58	.939	24	1.023
Electricians, class B.....	100	.804	34	.726	64	.843	45	.898
Machinists, class A.....	66	.963	1	( <sup>1</sup> )	50	.900	42	.913
Machinists, class B.....	224	.798	88	.721	120	.850	108	.870
Maintenance men, general.....	276	.827			246	.829	36	.815
<b>Supervision:</b>								
Working foremen, processing departments.....	360	.981	35	.852	256	1.013	210	1.054
<b>Processing—mining (underground):</b>								
Cagers, inside.....	264	.861	7	( <sup>1</sup> )	244	.876	216	.886
Drilling-machine operators, production.....	2,176	.869	653	.796	1,446	.913	858	.838
Drilling-machine operators, special.....	295	1.000	214	.992	71	1.068	45	1.068
Loading-machine operators.....	390	.940			379	.946	267	.893
Miners, all-round.....	24	.598			12	.780	12	.780
Muckers.....	1,915	.957	451	.779	1,213	1.100	1,080	1.144
Pumpmen.....	131	.757	36	.714	93	.778	75	.807
Timbermen.....	240	.745	215	.743	12	.835	12	.835
Trackmen, inside.....	488	.814	44	.706	424	.831	264	.841
<b>Processing—mining (surface):</b>								
Drilling-machine operators.....	101	.722			40	.802	39	( <sup>1</sup> )
Pitmen.....	72	.621			2	( <sup>1</sup> )		
Power-shovel operators, capacity— Under 5 cubic yards.....	67	.991			19	.886	18	( <sup>1</sup> )
5 cubic yards and over.....	36	1.354						
Trackmen, surface.....	59	( <sup>1</sup> )			1	( <sup>1</sup> )		
<b>Processing—milling:</b>								
Ball-mill operators.....	26	.756	8	.688	18	.786	9	( <sup>1</sup> )
Crusher operators.....	222	.738	30	.683	169	.766	132	.784
Filter operators.....	23	.744			23	.744		
Flotation operators.....	175	.828	16	.673	159	.844	135	.853
Helpers, processing machines.....	366	.726	42	.674	310	.736	288	.741
Jig operators.....	308	.818	18	.700	286	.829	261	.844
<b>Inspection and testing:</b>								
Samplers, ore.....	18	.701			5	.799	3	( <sup>1</sup> )
Samplers.....	48	.757	3	.668	28	.801	24	.813
<b>Recording and control:</b>								
Timekeepers.....	21	.827	3	.794	9	.929	9	.929
<b>Material movement:</b>								
Conveyor operators.....	49	.743	2	( <sup>1</sup> )	39	.765	36	.773
Hoistmen.....	418	.814	51	.745	327	.840	261	.855
Locomotive engineers.....	26	( <sup>1</sup> )						
Locomotive firemen.....								
Motormen, inside.....	234	.900	77	.819	152	.945	57	.837
Tractor operators.....	200	.899			1	( <sup>1</sup> )		
Trammers.....	543	.753	158	.757	352	.767	339	.771
Truck drivers.....	100	.753	2	( <sup>1</sup> )	86	.781	84	.784
Truck operators, capacity— Under 10-ton.....	140	.646			62	.638	60	( <sup>1</sup> )
10-ton and over.....	84	.833						
<b>Custodial:</b>								
Change-house men.....	24	.655	10	.661	8	.681	3	( <sup>1</sup> )
Watchmen.....	224	.598	38	.691	155	.590	132	.592

<sup>1</sup> Too few workers and/or plants to warrant computation of an average.

tions in Nonferrous-Metal Mines and Mills, by Region and Metal, June 1943—Con.

Midwest—Continued				Northeast		Southeast		Occupation
Other States: Lead and zinc		Other metals		Lead and zinc		All metals		
Number of workers	Average hourly earnings	Number of workers	Average hourly earnings	Number of workers	Average hourly earnings	Number of workers	Average hourly earnings	
17	\$0.865	12	\$0.725	16	\$1.007	17	\$0.723	Maintenance:
37	.847	14	.886	9	1.052	8	.968	Blacksmiths.
22	.754	9	.683	4	.873	24	.713	Carpenters, class A.
34	.880	4	1.013	15	1.043	9	.907	Carpenters, class B.
19	.714	2	(1)	17	.921	1	(1)	Electricians, class A.
8	(1)	15	1.172	14	1.111	7	.960	Electricians, class B.
12	(1)	16	.831	19	.925	18	.658	Machinists, class A.
210	.831	30	.816	10	.984			Machinists, class B.
								Maintenance men, general.
46	.828	69	.925	16	1.126	33	.747	Supervision:
								Working foremen, processing departments.
28	.792	13	.672	16	.981	26	.772	Processing—mining (underground):
588	1.022	77	.661	44	.983	237	.857	Cagers, inside.
26	1.067	10	.690	11	(1)	60	(1)	Drilling-machine operators, production.
112	1.073	11	.760	6	(1)	93	.757	Drilling-machine operators, special.
		12	.417	137	1.041	52	(1)	Loading-machine operators.
133	.744	251	.583	152	.866	291	.669	Miners, all-round.
18	.654	2	(1)	16	.883	22	.674	Muckers.
		13	.700	115	.898	56	.731	Pumpmen.
160	.813	20	.699	2	(1)	28	.729	Timbermen.
								Trackmen, inside.
1	(1)	61	.670			3	.517	Processing—mining (surface):
2	(1)	70	.628			83	.392	Drilling-machine operators.
								Pitmen.
1	(1)	48	1.033			10	.939	Power-shovel operators, capacity—
		36	1.354					Under 5 cubic yards.
1	(1)	58	(1)					5 cubic yards and over.
								Trackmen, surface.
9	.759			16	.860	7	.621	Processing—milling:
37	.700	23	.603	53	.884	15	.663	Ball-mill operators.
23	.744			9	.851	5	.620	Crusher operators.
24	.792			9	.885	26	.781	Filter operators.
22	.681	14	.664	13	(1)	15	.690	Flotation operators.
25	.678	4	.500	7	(1)	9	.693	Helpers, processing machines.
								Jig operators.
2	(1)	13	.664			12	.638	Inspection and testing:
4	.729	17	(1)	7	.852	10	.660	Samplers, ore.
								Samplers.
		9	.736	2	(1)	3	.712	Recording and control:
								Timekeepers.
3	(1)	8	.649	6	.949	12	.695	Material movement:
66	.780	40	.694	19	1.012	62	.777	Conveyor operators.
		26	(1)					Hoistmen.
								Locomotive engineers.
95	1.010	5	.802	29	.949	42	.818	Locomotive firemen.
1	(1)	199	.899			17	.729	Motormen, inside.
13	.655	33	.575	32	.867	8	.989	Tractor operators.
2	(1)	12	.563	4	.860	12	.651	Trammers.
								Truck drivers.
2	(1)	78	.653			43	.480	Truck operators, capacity—
		84	.833					Under 10-ton.
								10-ton and over.
5	.640	6	(1)	9	.809	12	.645	Custodial:
23	.575	31	.526	3	(1)	19	.777	Change-house men.
								Watchmen.

Incentive earnings are reflected in the relatively high average hourly earnings of workers in some occupations. All-round miners, for example, earned an average of \$1.049 an hour and special drilling-machine operators an average of \$1.093 an hour. As stated earlier, incentive methods of wage payment were found in relatively few occupations.

It should be borne in mind that general averages for the country as a whole have only limited significance, because they do not reflect regional differences in occupational and wage structure. This is evident from table 2 and from the following discussion of the wage structure within each of the six broad regions.

#### REGIONAL VARIATIONS

The *Northwest region*, of greatest importance in the industry from the standpoint of employment and production, includes the States of Idaho, Montana, Colorado, Nevada, Utah, and the northeastern section of Washington. Forty-five percent of all the mining and milling workers studied were employed in establishments in this region. Approximately two-thirds of the 18,689 workers covered in the Northwest region were engaged in occupations in which the average earnings amounted to \$1.00 an hour or more. The lowest earnings were those of trackmen in open-pit mines, who averaged 76.6 cents an hour. While over 75 percent of the workers in the selected processing occupations in the mines were in occupations averaging \$1.00 or more an hour, the highest average for any processing occupation in the mills was 96.7 cents an hour for flotation operators, an occupation accounting for less than one-fourth of the workers in the six mill processing occupations for which figures are shown.

Nearly half of the workers covered in the Northwest region were employed in copper mines and mills. Over 44 percent of these workers were classified as all-round miners and earned an hourly rate of \$1.094. Slightly more than one-third of the workers in the Northwest were employed in lead and zinc mines and mills. Fully three-fifths of all the workers in lead and zinc operations in the Northwest were concentrated in four processing occupations, namely, muckers, all-round miners, timbermen, and production drilling-machine operators. Workers in these occupations earned on an average 94.7 cents, \$1.013, \$1.033 and \$1.036 an hour, respectively. In operations extracting and milling other than copper, lead, and zinc ores, average hourly earnings ranged from 68.2 cents an hour for watchmen to \$1.323 an hour for ore samplers, and over half of the workers in these operations were in occupations with average earnings within the 10-cent interval of 80 to 90 cents an hour.

Approximately one-fifth of the workers studied were employed in the *Southwest region*, which includes, in addition to Arizona and New Mexico, three small operations situated in Texas. More than 75 percent of the workers in the Southwest were employed in copper mining and milling operations; consequently the relatively high wages paid to this group of workers are reflected in the averages shown for the region as a whole. In the lead and zinc mines and mills only one occupation, that of special drilling-machine operators, paid an average rate exceeding \$1.00 an hour, whereas in the copper operations over half of the workers, distributed among 13 occupational groups, earned

\$1.00 an hour or more. Over half of the lead and zinc workers were found in the 16 occupations with average earnings ranging from 80 to 90 cents an hour. Approximately 40 percent of the workers in lead and zinc establishments, as against only 14 percent of the copper workers, were in occupations with average earnings below 80 cents an hour.

Establishments producing nonferrous ores other than copper, lead, and zinc accounted for only 344 of the 8,024 workers covered in the Southwest region. The extremely low earnings shown for some of these workers (for example, 36.2 cents an hour for pumpmen and 41.3 cents for crusher operators) are in part accounted for by the fact that the group of plants in this "other metals" category includes a number of small and isolated operations.

The *Pacific region*, relatively unimportant in terms of number of workers employed, includes the States of California, Oregon, and northwestern Washington. The earnings of the 1,318 workers in the Pacific region ranged from 80 cents an hour for timekeepers to \$1.306 for class A carpenters. Workers in 14 of the 36 occupational groups for which average hourly earnings are shown were paid \$1.00 or more an hour. Approximately one-half of all the workers were found in these 14 occupations. Only 5 occupations, accounting for less than 5 percent of the workers, had average hourly earnings of 85 cents or less.

Slightly more than one-fourth of all mine and mill workers studied were found in the *Midwest region*. This region, most important for its production of lead and zinc ores, includes the States of Arkansas, Kansas, Michigan, Missouri, Oklahoma, and Wisconsin. More than half of the employees in the selected occupations in this region were engaged in processing operations in the underground mines, as against only one-tenth in processing occupations in the mills. Muckers and production drilling-machine operators constituted over one-third of the total number of workers in the region. In only two occupations, special drilling-machine operators and power-shovel operators, were the average earnings \$1.00 or more an hour. One-fifth of the workers surveyed in the Midwest region were in occupations in which average hourly earnings ranged from 70 to 80 cents an hour, and somewhat more than two-fifths of the workers were in occupations having averages between 80 and 90 cents an hour.

Lead and zinc mines and mills employed approximately two-thirds of the workers in the Midwest region. The average hourly earnings shown for the Tri-State lead and zinc operations reflect the recent retroactive wage increases granted to workers in four of the companies studied in the area.<sup>6</sup> The relatively high average hourly earnings (\$1.144) shown for muckers in the Tri-State area result from incentive wage payments to these workers in all but one of the companies included in the study, more favorable working conditions resulting from changes in mining practice, and premium rates of pay when working under unusual conditions. These factors account for the sharp increase in the average hourly earnings of these workers since 1941. In a majority of the occupations average earnings were somewhat higher in the Tri-State area than in the other areas in the Midwest region.

<sup>6</sup> Similar increases have been granted to workers in other companies in the area subsequent to the date when field work for the Bureau's present study was completed; these wage changes are not reflected, however, in the earnings data presented in this study.

The *Northeast region* includes the States of New York and New Jersey. All of the mines and mills surveyed in this region were engaged in the production of lead and zinc ore. The average earnings in this region, which accounted for relatively few of the total workers included in the study, ranged from 80.9 cents an hour for change-house men to \$1.126 an hour for working foremen. Nearly three-fifths of the workers were concentrated in the 15 occupations having average hourly earnings of between 85 and 95 cents, while fully another fourth of the workers were in 7 occupations with average earnings in excess of \$1.00 an hour.

Only 3.4 percent of the workers surveyed were employed in mines and mills in the *Southeast region*, which includes the States of Alabama, Georgia, North Carolina, Tennessee and Virginia. In no occupation in this region were workers paid on an average as much as \$1.00 an hour. Muckers, who formed the largest occupational group, earned 66.9 cents an hour; the highest average shown for any occupation was 98.9 cents an hour for trammers, and the lowest average, 39.2 cents an hour, was paid to pitmen. Slightly more than two fifths of the workers in the Southeast region were in occupations which averaged less than 70 cents an hour, and more than one-fourth were concentrated in the 12 occupations for which average earnings were between 70 and 80 cents an hour.

#### SUMMARY COMPARISONS, BY REGION

The wage data shown in table 2 for the mining and milling of nonferrous-metal ores indicate that in June 1943 considerable variation existed in wage levels among the several regions. In an attempt to measure the extent of these regional differences, the averages for 23 selected occupations were combined into a single weighted average for each region. For this purpose, the respective occupations were given the same weight, regardless of region. The resulting composite averages are presented below:

	Average hourly earnings	Percent of Northwest average
Northwest.....	\$0. 98	100
Pacific.....	1. 01	104
Southwest.....	. 89	91
Midwest.....	. 86	88
Northeast.....	. 94	96
Southeast.....	. 76	78

On the basis of data for 23 identical occupations combined, it appears that there was an average difference of about 25 cents per hour between wages in the Pacific region and those in the Southeast region. Among three regions (Pacific, Northwest, and Northeast) the difference was only 7 cents; excluding the Southeast region, the difference for the remaining five regions was only 15 cents. Factors other than regional differences, such as differences in size of plant, corporate affiliation, and unionization, have undoubtedly influenced the relative wage levels to some extent.

## PART II.—*Smelting and Refining*

### PRIMARY SMELTING AND REFINING

#### *Scope and Method of Survey*

As has been mentioned earlier, the Bureau's survey included smelting and refining, as well as mining and milling. Smelters extract the metal or metals from the ore in a furnace by reduction. Refineries, as the name implies, further refine the metals by removing impurities. Of the several refining processes, the electrolytic process is perhaps the most general.

The survey included virtually all establishments engaged in the primary smelting and refining of copper, lead, and zinc. These plants are scattered over 24 States. Of the 60 establishments studied, 47 with 10,240 workers were primary smelters, and 13 with 3,742 workers were refineries.

TABLE 3.—*Nonferrous-Metal Smelters and Refineries Covered by Bureau's Survey, June 1943*

Branch	Primary smelting			Refining		
	Number of units	Workers		Number of units	Workers	
		Number	Percent		Number	Percent
All branches.....	47	10, 240	100. 0	13	3, 742	100. 0
Copper.....	19	4, 045	39. 5	8	2, 539	67. 9
Lead.....	13	1, 853	18. 1	5	1, 208	32. 1
Zinc.....	15	4, 542	44. 4			

Separate tabulations of the average hourly earnings are presented in this report for each process, i. e., for smelting and refining and, whenever possible, for separate metals within each process. Thus, separate figures are shown for copper smelters, zinc smelters, lead smelters, electrolytic copper refineries, and electrolytic zinc production. The wage data have been shown by region in all cases where there was a sufficient number of plants and workers to permit such an analysis. Regional divisions used for purposes of presenting the data necessarily vary from one branch of the industry to another. The selected occupations for each division are grouped by type of operation.

#### *The Labor Force*

The labor force in primary smelting and refining establishments is composed almost exclusively of male workers. Separate occupational averages are not shown for the few female workers who came within the scope of the present study.

Because of differences in production processes, there are also wide variations from one plant to another in the occupational composition of the labor force. These variations are indicated by the number of plants represented in each occupational classification. The wage data shown for copper smelting provide a good example of the variations in occupational structure between plants in the same division of the industry. Although most of the important processing occupations

are found in the majority of the 19 copper-smelting establishments, some occupations (for example, bag-house operators, binmen, and roaster and sinter firemen) were found only in a relatively small number of plants.

The working force in the nonferrous-metal smelting and refining industry is very extensively organized by labor unions. Over 95 percent of the workers surveyed in refining operations were employed in plants having union agreements; similarly, union plants employed 77.2 percent of the workers studied in primary smelters. The International Union of Mine, Mill and Smelter Workers accounted for the greater part of union membership in primary smelters and refineries.

#### *Wage-Payment Practices*

Practically all of the workers studied in nonferrous-metal refineries were paid on a time basis; the few workers who were paid under incentive methods of wage payment were employed in copper refineries. In the primary smelters 94.2 percent of all workers were paid on a time basis; time rates were paid to all workers in copper smelters, to 93 percent of the workers in lead smelters, and to 89.7 percent of the workers in zinc smelters.

Most of the primary smelters and refineries reported the operation of three shifts. The majority of the workers, however (63 percent in smelting and nearly 75 percent in refining), were employed on the first shift. None of the primary smelters or refineries reported the payment of shift differentials; rotation of shifts was practiced in approximately one-half of the plants studied.

All employees in the primary smelting and refining establishments surveyed were compensated at the rate of time and a half for all work above 40 hours a week; in about nine-tenths of the plants this overtime rate was also paid after 8 hours per day.

Of the 55 primary smelters and refineries reporting established entrance rates for male common labor, 32 paid these workers starting rates of between 70 and 85 cents an hour.

#### *Occupational Earnings*

*Copper smelting.*—Over one-half (54.6 percent) of the 4,045 workers in the 19 copper smelters studied were employed in the 17 occupations having average earnings between 80 and 95 cents an hour (table 4). Aside from an average rate of \$1.04 paid working foremen, earnings of more than \$1.00 an hour were found in only 4 occupations, all of which were class A maintenance occupations. The 445 converter helpers, who formed the largest occupational group, earned 84.3 cents an hour. Two other numerically important processing occupations—converter punchers and reverberatory-furnace helpers—had average hourly earnings of 84.9 and 78.5 cents respectively. In the material-movement group of occupations, loaders and unloaders earned an average of 78.7 cents an hour. The range in average hourly earnings for workers in the 31 selected occupations for which figures are shown was from 76.8 cents for watchmen to \$1.282 for class A bricklayers.

TABLE 4.—Straight-Time Average Hourly Earnings of Workers in Selected Occupations in Copper Smelting, by Region,<sup>1</sup> June 1943

Occupation	Total <sup>1</sup>			Northwest		
	Number of plants	Number of workers	Average hourly earnings	Number of plants	Number of workers	Average hourly earnings
<b>Maintenance:</b>						
Bricklayers, refractory brick, class A.....	9	35	\$1.282	3	18	\$1.228
Carpenters, class A.....	9	140	1.061	4	105	1.063
Carpenters, class B.....	7	42	.955	1	5	( <sup>2</sup> )
Electricians, class A.....	14	123	1.070	4	61	1.066
Electricians, class B.....	9	44	.975	1	5	( <sup>3</sup> )
Helpers, journeymen.....	11	264	.882	4	150	.957
Machinists, class A.....	12	107	1.073	4	59	1.067
Machinists, class B.....	10	46	.938	1	7	( <sup>3</sup> )
Maintenance men, general.....	3	178	.952	1	103	( <sup>3</sup> )
<b>Supervision:</b>						
Working foremen, processing departments.....	8	53	1.040	1	14	( <sup>2</sup> )
<b>Processing:</b>						
Bag-house operators.....	4	15	.888			
Binmen.....	8	100	.844	3	66	.913
Casting-machine operators.....	12	89	.866	2	44	.975
Converter helpers, all-round.....	9	445	.843	2	30	.952
Converter punchers.....	14	264	.849	4	82	.935
Converter skimmers.....	15	130	.963	4	34	1.003
Cottrell operators.....	9	76	.953	4	54	.993
Reverberatory-furnace chargers.....	10	52	.840	2	15	.916
Reverberatory-furnace helpers, all-round.....	15	268	.785	4	96	.925
Reverberatory-furnace operators.....	18	157	.933	5	31	1.089
Reverberatory-furnace tappers.....	16	82	.891	4	24	.922
Roaster and sinter firemen.....	8	73	.913	3	33	.955
<b>Inspection and testing:</b>						
Samplers.....	12	79	.832	3	30	.960
<b>Recording and control:</b>						
Weighers, metal.....	11	90	.919	2	8	.963
<b>Material movement:</b>						
Crane followers.....	15	72	.857	5	34	.958
Crane operators, electric bridge.....	17	199	.969	5	78	1.010
Loaders and unloaders.....	13	355	.787	3	90	.888
Motormen.....	15	200	.908	4	132	.978
<b>Custodial:</b>						
Guards.....	7	128	.885	3	78	.940
Janitors.....	11	54	.810	3	25	.893
Watchmen.....	8	85	.768	3	33	.853
			Southwest			East
<b>Maintenance:</b>						
Bricklayers, refractory brick, class A.....	5	12	\$1.229	1	5	( <sup>2</sup> )
Carpenters, class A.....	3	10	.986	2	25	\$1.083
Carpenters, class B.....	2	20	.949	3	14	.967
Electricians, class A.....	6	33	1.012	4	29	1.144
Electricians, class B.....	3	23	.947	3	13	1.037
Helpers, journeymen.....	6	107	.787	1	7	( <sup>2</sup> )
Machinists, class A.....	5	25	1.017	3	23	1.152
Machinists, class B.....	5	20	.929	2	9	1.060
Maintenance men, general.....	1	54	( <sup>2</sup> )			
<b>Supervision:</b>						
Working foremen, processing departments.....	6	37	1.019	1	2	( <sup>2</sup> )
<b>Processing:</b>						
Bag-house operators.....	1	1	( <sup>2</sup> )	3	14	.910
Binmen.....	5	34	.711			
Casting-machine operators.....	5	13	.792	3	3	.848
Converter helpers, all-round.....	4	63	.626	3	352	.872
Converter punchers.....	7	154	.771	3	28	1.023
Converter skimmers.....	7	55	.903	4	41	1.011
Cottrell operators.....	4	17	.832	1	5	( <sup>2</sup> )
Reverberatory-furnace chargers.....	4	16	.779	3	13	.900
Reverberatory-furnace helpers, all-round.....	6	110	.707	3	8	.879
Reverberatory-furnace operators.....	8	50	.880	3	60	.940
Reverberatory-furnace tappers.....	6	33	.777	4	22	.894
Roaster and sinter firemen.....	4	25	.841	1	15	( <sup>2</sup> )
<b>Inspection and testing:</b>						
Samplers.....	6	39	.733	3	10	.834
<b>Recording and control:</b>						
Weighers, metal.....	4	5	.865	4	75	.921

See footnotes at end of table.

TABLE 4.—*Straight-Time Average Hourly Earnings of Workers in Selected Occupations in Copper Smelting, by Region,<sup>1</sup> June 1943—Continued*

Occupation	Southwest			East		
	Number of plants	Number of workers	Average hourly earnings	Number of plants	Number of workers	Average hourly earnings
<b>Material movement:</b>						
Crane followers.....	7	28	\$0.742	3	10	\$0.536
Crane operators, electric bridge.....	8	64	.937	3	55	.957
Loaders and unloaders.....	6	88	.649	3	171	.807
Motormen.....	7	50	.789	2	8	.733
<b>Custodial:</b>						
Guards.....	3	18	.829	1	32	( <sup>2</sup> )
Janitors.....	6	20	.704	2	9	.815
Watchmen.....	3	44	.720	-----	-----	-----

<sup>1</sup> Northwest region includes Montana, Nevada, Utah, and Washington; Southwest region includes Arizona, New Mexico, and Texas; Eastern region includes New Jersey, New York, and Tennessee.

<sup>2</sup> Includes 2 plants in Michigan. Average hourly earnings by occupation for these two plants are as follows: Electricians, class B, 76.5 cents; machinists, class B, 76.1 cents; casting-machine operators, 73.5 cents; reverberatory-furnace helpers, all-round, 67.8 cents; reverberatory-furnace operators, 77.1 cents; reverberatory-furnace tappers, 81.9 cents; motormen, 70.4 cents; watchmen, 68.3 cents.

<sup>3</sup> Too few workers and/or plants to warrant the computation of an average.

In each of the three broad regions for which figures are shown, well over half of the workers were found in occupations having average hourly earnings within a 10-cent range. In the Northwest region, the range was from 90 cents to \$1.00; in the East from 80 to 90 cents; and in the Southwest, from 70 to 80 cents. These concentrations indicate, in a general way, substantial regional variations in earnings. Regional averages based on data for 18 identical occupations, comprising roughly three-fourths of the workers covered, further confirm these variations. Thus, the earnings of workers in these selected occupations averaged 78.3 cents an hour in the Southwest region, 91.8 cents an hour in the Eastern region, and 97.0 cents an hour in the Northwest region.

*Zinc smelting.*—Straight-time average hourly earnings for workers in selected occupations in the 15 primary zinc smelters studied ranged from 79.5 cents an hour for guards to \$1.287 an hour for lead burners (table 5). Nearly three-fourths of all the workers were in occupations with average earnings in excess of 90 cents an hour and 45 percent were in occupations with average earnings of over \$1.00 an hour. Three occupational groups, chargers, metal drawers, and loaders and unloaders, which accounted for almost a third of the workers studied, had hourly earnings of \$1.003, \$1.007, and 85.9 cents, respectively.

A regional comparison of the earnings of workers in occupations for which figures are shown in two or more regions indicates that the East had higher average earnings than either of the other two regions in all but two of the occupational groups, namely, class A bricklayers and class B machinists. The highest average hourly earnings in the East (\$1.448) were paid to lead burners. This compares with a high of \$1.246 for workers in the same occupation in the North Central region and a high of \$1.292 for class A bricklayers in the South Central region.

TABLE 5.—*Straight-Time Average Hourly Earnings of Workers in Selected Occupations in Zinc Smelters, by Region,<sup>1</sup> June 1943*

Occupation	Total			South Central		
	Number of plants	Number of workers	Average hourly earnings	Number of plants	Number of workers	Average hourly earnings
<b>Maintenance:</b>						
Bricklayers, refractory brick, class A.....	6	39	\$1.269	3	3	\$1.292
Bricklayers, refractory brick, class B.....	4	11	.993			
Carpenters, class A.....	7	19	1.115	3	12	1.080
Carpenters, class B.....	7	37	1.007	2	6	.950
Electricians, class A.....	10	24	1.109	5	14	1.045
Electricians, class B.....	11	41	1.039	4	7	.950
Gas-producer operators.....	6	155	1.039			
Helpers, journeymen.....	10	129	.905	3	17	.836
Machinists, class A.....	7	25	1.134	3	7	1.058
Machinists, class B.....	8	76	1.041	3	18	.974
<b>Supervision:</b>						
Working foremen, processing departments.....	8	65	1.211	5	43	1.162
<b>Processing:</b>						
Bag-house operators.....	8	35	.954	4	17	.898
Binmen.....	6	64	.874	4	53	.846
Chambermen (acid department).....	7	56	1.052	1	12	( <sup>2</sup> )
Chargers, retorts, hand.....	14	528	1.003	7	278	.993
Chisellers.....	13	340	.925	7	175	.926
Condenser makers (pottery department).....	14	75	.941	7	43	.907
Connie boys.....	14	315	.897	7	164	.895
Lead burners (acid department).....	8	39	1.287	1	10	( <sup>2</sup> )
Loamers.....	13	287	.933	6	120	.913
Metal drawers.....	15	451	1.007	7	205	.973
Mill operators (crush, grind, and mix).....	13	110	.911	6	63	.889
Retort firemen.....	14	261	1.112	6	118	1.070
Retort press operators.....	11	42	.898	6	30	.877
Roaster and sinter firemen.....	14	207	1.036	7	66	.969
Stampers.....	11	282	.958	7	155	.924
<b>Inspection and testing:</b>						
Samplers.....	9	19	.897	1	3	( <sup>2</sup> )
<b>Recording and control:</b>						
Weighers, metal.....	10	24	.896	5	14	.843
<b>Material movement:</b>						
Crane operators, electric bridge.....	4	11	1.115	1	1	( <sup>2</sup> )
Loaders and unloaders.....	12	493	.859	6	273	.818
Motormen.....	7	84	.897	3	49	.894
Truckers, hand.....	6	78	.875	3	55	.854
<b>Custodial:</b>						
Guards.....	9	37	.795	5	15	.754
Janitors.....	9	42	.827	4	20	.845
Watchmen.....	7	43	.893	2	12	.762

<sup>1</sup> South Central region includes Oklahoma, Texas, and Arkansas; North Central region includes Illinois; Eastern region includes Pennsylvania and West Virginia.

<sup>2</sup> Too few workers and/or plants to warrant computation of an average.

TABLE 5.—*Straight-Time Average Hourly Earnings of Workers in Selected Occupations in Zinc Smelters, by Region,<sup>1</sup> June 1943—Continued*

Occupation	North Central			East		
	Number of plants	Number of workers	Average hourly earnings	Number of plants	Number of workers	Average hourly earnings
Maintenance:						
Bricklayers, refractory brick, class A				3	36	\$1.267
Bricklayers, refractory brick, class B	3	6	\$.997	1	5	( <sup>2</sup> )
Carpenters, class A	1	2	( <sup>2</sup> )	3	5	1.185
Carpenters, class B	2	12	.877	3	19	1.108
Electricians, class A	1	2	( <sup>2</sup> )	4	8	1.209
Electricians, class B	3	6	1.013	4	28	1.067
Gas-producer operators	1	9	( <sup>2</sup> )	5	146	1.043
Helpers, journeymen	3	55	.831	4	57	.998
Machinists, class A	2	7	1.050	2	11	1.236
Machinists, class B	3	25	1.082	2	33	1.046
Supervision:						
Working foremen, processing departments	1	1	( <sup>2</sup> )	2	21	1.325
Processing:						
Bag-house operators	2	6	.863	2	12	1.081
Binmen				2	11	1.012
Chambermen (acid department)	3	20	.931	3	24	1.196
Chargers, retorts, hand	3	97	.921	4	151	1.073
Chisellers	2	50	.806	4	115	.974
Condenser makers (pottery department)	3	18	.942	4	14	1.043
Connie boys	2	26	.757	5	125	.930
Lead burners (acid department)	3	11	1.246	4	18	1.448
Loamers	3	94	.893	4	73	1.018
Metal drawers	3	93	.918	5	153	1.106
Mill operators (crush, grind, and mix)	3	21	.809	4	26	1.044
Retort firemen	3	53	1.026	5	90	1.218
Retort press operators	3	6	.830	2	6	1.074
Roaster and sinter firemen	3	63	.893	4	78	1.208
Stampers	1	50	( <sup>2</sup> )	3	77	1.043
Inspection and testing:						
Samplers	3	5	.816	5	11	.959
Recording and control:						
Weighers, metal	3	7	.924	2	3	1.078
Material movement:						
Crane operators, electric bridge	1	1	( <sup>2</sup> )	2	9	1.151
Loaders and unloaders	3	76	.859	3	144	.937
Motormen	2	18	.775	2	17	1.036
Truckers, hand				3	23	.927
Custodial:						
Guards	2	11	.806	2	11	.840
Janitors	2	13	.783	3	9	.849
Watchmen	2	6	.793	3	25	.980

<sup>1</sup> South Central region includes Oklahoma, Texas, and Arkansas; North Central region includes Illinois; Eastern region includes Pennsylvania and West Virginia.

<sup>2</sup> Too few workers and/or plants to warrant computation of an average.

Seven-eighths of the employees in the South Central region and nearly three-fourths of those in the North Central region were in occupations having average hourly earnings between 80 cents and \$1.00 an hour. In the Eastern region slightly less than one-third of the workers were in occupations with earnings within that range, but fully two-thirds were in occupations averaging \$1.00 or more an hour. The substantially higher level of earnings in the East is clearly indicated by general regional averages based on data for 22 identical occupations. Workers in these occupations in the Eastern region earned 11.4 cents more per hour on the average than similar workers in the South Central region and 15.7 cents an hour more than similar workers in the North Central region.

*Lead smelting.*—In the 13 lead smelters studied in the Bureau survey, average hourly earnings varied from 76.6 cents for watchmen to \$1.215 for class A bricklayers (table 6). Approximately 62 percent of the workers were in occupations with average earnings between 80 and 90 cents an hour. In only one occupation in the processing depart-

ment, that of desilverizing kettlemen, did workers average over \$1.00 an hour. The highest earnings were found in the maintenance department, where well over two-fifths of the workers were in 6 occupational classifications with average earnings in excess of \$1.00 an hour. Loaders and unloaders, the largest occupational group, earned an average of 89.7 cents an hour. Janitors and watchmen were the only workers receiving earnings below 80 cents an hour.

TABLE 6.—Straight-Time Average Hourly Earnings of Workers in Selected Occupations in Lead Smelting, by Region,<sup>1</sup> June 1943

Occupation	Total			West			Midwest		
	Number of plants	Number of workers	Average hourly earnings	Number of plants	Number of workers	Average hourly earnings	Number of plants	Number of workers	Average hourly earnings
<b>Maintenance:</b>									
Bricklayers, refractory brick, class A.....	6	11	\$1.215	4	9	\$1.209	2	2	\$1.243
Bricklayers, refractory brick, class B.....	2	3	1.062	1	2	(?)	1	1	(?)
Carpenters, class A.....	9	59	1.060	7	56	1.056	2	3	1.147
Carpenters, class B.....	7	22	.962	3	10	.987	4	12	.942
Electricians, class A.....	9	38	1.034	6	26	1.038	3	12	1.027
Electricians, class B.....	7	17	1.026	3	8	1.002	4	9	1.046
Helpers, journeymen.....	10	145	.839	5	113	.839	5	32	.838
Machinists, class A.....	10	50	1.050	7	41	1.055	3	9	1.027
Machinists, class B.....	8	23	.945	4	14	.941	4	9	.951
Maintenance men, general.....	3	35	.996				3	35	.996
<b>Supervision:</b>									
Working foremen, processing departments.....	4	22	1.102	3	19	1.120	1	3	(?)
<b>Processing—Smelting department:</b>									
Bag-house operators.....	9	57	.944	6	40	.956	3	17	.917
Binmen.....	5	26	.813	4	23	.811	1	3	(?)
Blast-furnace chargers.....	10	81	.818	6	45	.860	4	36	.765
Blast-furnace operators.....	9	46	.896	6	27	.947	3	19	.823
Blast-furnace tappers.....	9	65	.893	5	43	.891	4	22	.897
Crushermen.....	6	44	.890	5	42	.888	1	2	(?)
Roaster and sinter firemen.....	8	70	.828	7	55	.839	1	15	(?)
<b>Processing—Refining department:</b>									
Casting-machine operators.....	7	49	.940	3	26	.949	4	23	.930
Desilverizing kettlemen.....	3	18	1.061	2	14	.957	1	4	(?)
Dross kettlemen.....	8	47	.843	3	19	.858	5	28	.833
Furnace helpers, all-round.....	8	76	.850	5	59	.861	3	17	.813
Furnace operators (refining and softening).....	5	43	.931	3	29	.963	2	14	.864
<b>Inspection and testing:</b>									
Samplers.....	10	67	.878	6	61	.880	4	6	.856
<b>Recording and control:</b>									
Weighers, metal.....	10	32	.943	6	24	.939	4	8	.962
<b>Material movement:</b>									
Crane followers.....	3	13	.827	1	7	(?)	2	6	(?)
Crane operators, electric bridge.....	10	55	.934	6	42	.930	4	13	.943
Loaders and unloaders.....	10	164	.897	6	131	.845	4	33	1.104
Motormen.....	7	93	.875	5	58	.886	2	35	.857
Truckers, hand.....	3	27	.829	2	15	.849	1	12	(?)
<b>Custodial:</b>									
Guards.....	7	58	.858	4	35	.894	3	23	.802
Janitors (including change-house men).....	12	57	.798	6	35	.833	6	22	.742
Watchmen.....	8	40	.766	5	23	.776	3	17	.752

<sup>1</sup> West region includes California, Colorado, Idaho, Montana, Texas and Utah; Midwest region includes Illinois, Indiana, Kansas, Missouri and Nebraska.

<sup>2</sup> Too few workers and/or plants to warrant computation of an average.

In both the West and the Midwest, the highest average hourly earnings, \$1.209 and \$1.243, respectively, were received by class A bricklayers, and the lowest earnings found in each of these regions were received by watchmen (77.6 cents an hour) in the West, and janitors (74.2 cents an hour) in the Midwest. In approximately one-half of the occupational groups for which figures are presented, there is

considerable uniformity in the averages for the West and the Midwest. Averages for these two regions, based on 25 identical jobs and using constant weights, indicate an absolute difference of less than 1 cent between the two regions.

*Electrolytic copper refining.*—The earnings of workers in the 8 electrolytic copper refineries studied ranged from a low of 81.8 cents an hour for janitors to a high of \$1.329 an hour for class A bricklayers (table 7). Somewhat more than three-fifths of all the workers studied were found in the 21 occupations having average earnings of between 85 cents and \$1.00 an hour. All workers in occupations classified in the maintenance group, excluding class B electricians and journeymen's helpers, earned more than \$1.00 an hour. Well over two-fifths of the workers were employed in 17 processing occupations; in only 2 of these occupations, however, strippers and reverberatory-furnace operators, did workers earn as much as \$1.00 an hour. Ingot inspectors and crane operators, the 2 largest occupational groups, averaged 90.3 cents and 91.1 cents an hour, respectively.

TABLE 7.—*Straight-Time Average Hourly Earnings of Workers in Selected Occupations in Electrolytic Copper Refining, by Region,<sup>1</sup> June 1943*

Occupation	Total			East			Other States		
	Number of plants	Number of workers	Average hourly earnings	Number of plants	Number of workers	Average hourly earnings	Number of plants	Number of workers	Average hourly earnings
<b>Maintenance:</b>									
Bricklayers, refractory brick, class A.....	3	16	\$1.329	1	13	( <sup>2</sup> )	2	3	( <sup>2</sup> )
Carpenters, class A.....	6	81	1.092	5	43	\$1.117	1	38	( <sup>2</sup> )
Carpenters, class B.....	5	23	1.036	4	21	1.052	1	2	( <sup>2</sup> )
Electricians, class A.....	6	53	1.107	4	30	1.156	2	23	\$1.044
Electricians, class B.....	5	36	.985	4	31	1.010	1	5	( <sup>2</sup> )
Helpers, journeymen.....	3	89	.914	1	26	( <sup>2</sup> )	2	63	.944
Machinists, class A.....	6	87	1.126	5	72	1.140	1	15	( <sup>2</sup> )
Machinists, class B.....	5	53	1.028	5	53	1.028			
<b>Supervision:</b>									
Working foremen, processing departments.....	4	45	1.025	2	20	.976	2	25	1.065
<b>Processing:</b>									
Circulation men, tanks.....	7	91	.903	5	82	.896	2	9	.966
Electrolytic-tank operators.....	7	32	.940	4	20	.976	3	12	.881
Hot-sheet men.....	4	137	.835	3	104	.927	1	33	( <sup>2</sup> )
Loopers and punchers.....	5	49	.970	4	47	.988	1	2	( <sup>2</sup> )
Strippers.....	7	130	1.008	5	100	1.068	2	30	.842
Washers and cleaners.....	8	86	.904	5	39	.871	3	47	.932
Casting-machine operators.....	7	40	.960	4	16	.960	3	24	.960
Furnace helpers, all-round.....	5	48	.880	2	12	.901	3	36	.873
Ladlers (mold casting).....	7	53	.896	5	34	.895	2	19	.897
Reverberatory-furnace chargers.....	6	47	.938	4	37	.935	2	10	.951
Reverberatory-furnace operators.....	6	104	1.006	4	98	1.019	2	6	.794
Wheelmen.....	8	160	.949	5	152	.953	3	8	.862
Filter operators.....	3	10	.902	2	7	.873	1	3	( <sup>2</sup> )
Furnace operators.....	5	35	.969	4	32	.963	1	3	( <sup>2</sup> )
Leach operators.....	6	36	.928	5	34	.942	1	2	( <sup>2</sup> )
Process operators.....	5	29	.943	4	21	.945	1	8	( <sup>2</sup> )
Roaster and sinter firemen.....	3	27	.830	3	27	.830			
<b>Inspection and testing:</b>									
Inspectors, ingots.....	7	225	.903	5	218	.911	2	7	.649
Samplers.....	8	123	.902	5	119	.906	3	4	.782
Voltmeter men (tankhouse).....	7	55	.834	4	27	.926	3	28	.745
<b>Recording and control:</b>									
Weighers, copper.....	6	51	.908	3	37	.907	3	14	.910
<b>Material movement:</b>									
Crane followers.....	7	86	.842	5	72	.826	2	14	.926
Crane operators, electric bridge.....	7	273	.911	5	252	.913	2	21	.882
Motormen.....	6	30	.853	4	20	.835	2	10	.691
<b>Custodial:</b>									
Guards.....	2	51	.877	1	34	( <sup>2</sup> )	1	17	( <sup>2</sup> )
Janitors.....	5	48	.818	4	45	.812	1	3	( <sup>2</sup> )

<sup>1</sup> East includes Maryland, New Jersey, and New York; "Other States" include Montana, Texas, and Washington.

<sup>2</sup> Too few workers and/or plants to warrant computation of an average.

The regional analysis is presented in table 7 principally to show separate earnings data for the 5 plants in the Eastern region. The 3 plants represented in the earnings shown for "other States" are widely scattered (one in each of the States of Montana, Texas, and Washington) and the combined averages for these three plants have very limited significance. It will be noted also that the average hourly earnings for workers in the East have a dominating influence on the averages shown for all 8 copper refineries, because of the relatively large number of workers in the Eastern plants.

Nearly three-fourths of the workers studied in the 5 Eastern electrolytic copper refineries were in occupations with average earnings of between 80 cents and \$1.00 an hour, and all of the remaining workers were in occupations averaging \$1.00 or more an hour.

*Electrolytic zinc production.*—The information presented for electrolytic zinc production is based on data for 1,203 workers in 5 widely scattered plants (table 8). Over 90 percent of the workers in these plants were in occupations averaging 90 cents or more an hour. The highest average (\$1.146 an hour) was earned by class A electricians and the lowest average (70 cents an hour) by loaders and unloaders. Strippers, who formed the largest occupational group (320 workers), earned an average of 99 cents an hour. Leach operators, the second largest occupational group, had average hourly earnings of 92.8 cents an hour. With the exception of journeymen's helpers, who earned 90.7 cents an hour, all workers in the maintenance occupational groups averaged more than \$1.00 an hour.

TABLE 8.—*Straight-Time Average Hourly Earnings of Workers in Selected Occupations in Electrolytic Zinc Production, June 1943*<sup>1</sup>

Occupation	Number of plants	Number of workers	Average hourly earnings
<b>Maintenance:</b>			
Carpenters, class A.....	3	32	\$1.076
Carpenters, class B.....	2	3	1.071
Electricians, class A.....	4	23	1.146
Helpers, journeymen.....	4	47	.907
Machinists, class A.....	4	14	1.140
<b>Supervision:</b>			
Working foremen, processing departments.....	4	49	1.099
<b>Processing:</b>			
Electrolytic-tank operators.....	5	93	.966
Filter operators.....	5	66	1.007
Furnace operators (casting).....	3	46	.879
Furnace operators' helpers, all-round.....	3	22	.870
Ladlers.....	5	76	.871
Leach operators.....	5	158	.928
Roaster firemen.....	3	70	.974
Strippers.....	5	320	.990
<b>Inspection and testing:</b>			
Samplers.....	5	23	.912
<b>Recording and control:</b>			
Weighers, metal.....	3	5	1.120
<b>Material movement:</b>			
Loaders and unloaders.....	3	29	.700
Truck drivers.....	4	53	1.004
Truckers, hand.....	3	18	.894
<b>Custodial:</b>			
Guards.....	2	26	.861
Janitors.....	4	13	.796
Watchmen.....	3	17	.924

<sup>1</sup> States included are Idaho, Illinois, Montana, and Texas.

#### SECONDARY SMELTING

Secondary smelting plants are engaged in the reclaiming or salvaging of nonferrous metals from either old or new scrap material.

The impurities in this scrap material are removed by various heating processes, and the pure metal recovered from such scrap is then usually poured into ingots.

The Bureau's survey of nonferrous-metal secondary smelters included 79 plants, most of which are situated in or near large cities. Each of the plants covered employed 9 or more workers, and detailed occupational wage data were obtained for a total of 4,611 workers.

Incentive-wage systems are not commonly used in secondary smelters. At the time of the survey more than 95 percent of the workers in these establishments were paid on a time basis. All workers were compensated at the rate of time and a half for work above 40 hours a week. In 56 plants, this overtime rate was also paid for all work in excess of 8 hours a day. Forty-nine of the 67 smelters reporting established entrance rates for male common labor paid hourly rates to these workers of between 65 and 80 cents. At the time of the survey, 83.4 percent of the workers covered were employed in plants having union agreements.

Sixty-four of the plants studied operated more than one shift. Approximately two-thirds of the workers were employed on the first or daylight shift, one-fifth on the second or evening shift, and 15 percent on the third or night shift. Shift differentials were paid to workers on the second and third shift in only 8 of the 64 plants operating more than one shift.

In addition to figures for the country as a whole, detailed data are also presented for three broad regions, West, Central, and East.

#### *Average Hourly Earnings, by Occupation*

Straight-time average hourly earnings for 4,611 workers classified into 25 selected occupational groups are shown in table 9. Women workers were found in only one occupation—class C hand scrap sorters. A separate average is not shown for the 9 women employed in this occupation, because the difference between their hourly earnings and those of male workers in the same occupation is negligible.

For all secondary smelters included in the survey, the range in average hourly earnings was from 63.8 cents an hour for watchmen to \$1.178 an hour for class A machinists. The range in hourly earnings for processing occupations was from 74.9 cents for class C scrap sorters to 90.6 cents for class B grinding-machine operators. Furnace operators' helpers, who accounted for roughly one-fourth of all the workers studied, were paid an average of 79.9 cents an hour. Blast- and reverberatory-furnace operators and potmen together accounted for well over one-fourth of the total number of workers and earned average rates of 88.6 cents and 88.8 cents an hour, respectively. Average earnings of more than \$1.00 an hour were paid only to workers in some of the maintenance occupations.

In each of the three regions for which wage data are shown, the lowest average hourly earnings were paid to watchmen. Similarly, in each of the three regions, the highest average rates were earned by class A workers in one of the maintenance occupations.

TABLE 9.—Straight-Time Average Hourly Earnings of Workers in Selected Occupations in Secondary Smelters, by Region,<sup>1</sup> June 1943

Occupation	Total			West		
	Number of plants	Number of workers	Average hourly earnings	Number of plants	Number of workers	Average hourly earnings
<b>Maintenance:</b>						
Carpenters, class A	8	10	\$1.170	4	4	\$1.226
Carpenters, class B	15	19	.922	2	2	.975
Electricians, class A	8	12	1.142	1	1	(?)
Electricians, class B	13	49	1.035			
Machinists, class A	8	11	1.178	2	2	1.175
Machinists, class B	14	32	.920			
Maintenance men, general	20	74	.924	5	9	.961
<b>Supervision:</b>						
Working foremen, processing departments	29	74	.997	6	12	1.162
<b>Processing:</b>						
Briquetting-machine operators	35	161	.824	4	15	.886
Casters	27	175	.890	3	25	1.150
Furnace operators, blast and reverberatory	60	811	.886	11	117	.934
Furnace operators, other	35	287	.869	3	14	.870
Furnace operators' helpers	56	1,051	.799	6	53	.868
Grinding-machine operators, class B	9	68	.906	1	9	(?)
Grinding-machine operators, class C	8	21	.782	1	2	(?)
Potmen	41	450	.888	5	58	.868
Scrap-separator operators	22	145	.812			
Scrap sorters, hand, class B	37	182	.824	1	1	(?)
Scrap sorters, hand, class C	28	149	.749	2	4	.850
<b>Inspection and testing:</b>						
Samplers	22	55	.799	3	3	.867
<b>Recording and control:</b>						
Weighers	26	108	.852	3	6	.900
<b>Material movement:</b>						
Truck drivers	44	108	.886	7	15	.945
Truckers, hand	16	398	.769	3	32	.866
<b>Custodial:</b>						
Janitors	29	65	.748	3	4	.744
Watchmen	33	96	.638	2	3	.733
			Central			East
<b>Maintenance:</b>						
Carpenters, class A	2	3	\$1.197	2	3	\$1.070
Carpenters, class B	9	10	.926	4	7	.902
Electricians, class A	2	2	1.263	5	9	1.120
Electricians, class B	9	39	1.048	4	10	.983
Machinists, class A	4	4	1.241	2	5	1.128
Machinists, class B	7	12	.880	7	20	.883
Maintenance men, general	12	58	.916	3	7	.944
<b>Supervision:</b>						
Working foremen, processing departments	13	34	.952	10	28	.980
<b>Processing:</b>						
Briquetting-machine operators	17	67	.786	14	79	.844
Casters	16	97	.821	8	53	.892
Furnace operators, blast and reverberatory	30	506	.882	19	188	.866
Furnace operators, other	14	100	.895	18	173	.855
Furnace operators' helpers	30	461	.790	20	537	.800
Grinding-machine operators, class B	5	46	.904	3	13	.849
Grinding-machine operators, class C	3	12	.794	4	7	.721
Potmen	19	296	.897	17	96	.874
Scrap-separator operators	13	92	.802	9	53	.832
Scrap sorters, hand, class B	22	125	.826	14	56	.817
Scrap sorters, hand, class C	13	59	.741	13	86	.751
<b>Inspection and testing:</b>						
Samplers	13	38	.801	6	14	.778
<b>Recording and control:</b>						
Weighers	13	59	.811	10	43	.902
<b>Material movement:</b>						
Truck drivers	18	42	.894	19	51	.861
Truckers, hand	11	319	.770	2	47	.696
<b>Custodial:</b>						
Janitors	16	44	.755	10	17	.730
Watchmen	17	41	.604	14	52	.659

<sup>1</sup> West region includes California and Washington; Central region includes Kansas, Illinois, Indiana, Michigan, Missouri, and Ohio; East region includes New York, New Jersey, and Pennsylvania.

\* Too few workers and/or plants to warrant computation of an average.

The Western region, including California and Washington, employed only 391 of the workers studied in secondary smelters. Average earnings in this region varied from a low of 73.3 cents an hour for watchmen to a high of \$1.226 for class A carpenters. Blast- and reverberatory-furnace operators accounted for nearly one-third of the workers in the region and earned an hourly average of 93.4. All processing workers except 25 casters, whose average hourly earnings amounted to \$1.15, were in occupations with average earnings between 85 and 95 cents an hour.

The Central region, most important from the standpoint of employment and number of plants, accounted for more than half of the workers studied and included the six States of Illinois, Indiana, Ohio, Michigan, Missouri and Kansas. Employees in this region had average earnings ranging from 60.4 cents for watchmen to \$1.263 for class A electricians. Nearly one-fifth of the workers were employed as blast- and reverberatory-furnace operators and earned an average of 88.2 cents an hour. Furnace operators' helpers and hand truckers, next in order of numerical importance, had average earnings of 79 and 77 cents an hour, respectively.

The Eastern region consisted of 28 plants in New York, New Jersey, and Pennsylvania, employing 1,654 of the workers included in the survey. Average earnings for all workers in the region ranged from 65.9 cents an hour for watchmen to \$1.128 an hour for class A machinists. More than half of the workers were employed as furnace operators and furnace operators' helpers. Average hourly earnings for these three groups of workers amounted to 86.6, 85.5 and 80 cents an hour, respectively. Of the processing workers 93 percent were in occupations having average earnings between 80 and 90 cents an hour. Only two processing occupations, class C scrap sorters and class C grinding-machine operators, had hourly earnings outside of this 10-cent range; the averages for the workers engaged in these two occupations were 75.1 and 72.1 cents an hour, respectively.

### PART III.—*Wage Changes from August 1941 to June 1943*

Average hourly earnings in the nonferrous-metals industry were substantially higher in June 1943 than in August 1941, the date of the Bureau's earlier survey of the industry. For workers engaged in mining and milling, gross average hourly earnings, which include premium payments for overtime work, rose from 78 cents in August 1941 to \$1.00 in June 1943, an increase of about 28 percent. Eliminating the influence of overtime work at premium rates, the increase was approximately 25 percent. In the nonferrous smelting and refining industry as a whole, gross average hourly earnings increased from approximately 82 cents in August 1941 to about \$1.03 in June 1943, or nearly 26 percent. Excluding overtime premium payments, this increase amounted to roughly 20 percent. It must be noted that these over-all earnings data provide only a general picture of the shift in wages between the two periods studied, since they may be influenced considerably by changes in the occupational structure of the industry.

For the purpose of measuring the wage changes which occurred in specific occupations between August 1941 and June 1943, comparative straight-time average hourly earnings are shown in tables 10 to 12 for certain occupations which were studied in connection with both of the Bureau's surveys. The number of occupations for which comparisons can be shown are limited by differences in the methods used in the two studies. Whereas the earlier study covered virtually all occupations in the various branches of the industry, the June 1943 study was confined to selected key occupations. Moreover, in some instances, earnings data were computed for broader occupational groups in 1941 than in 1943. The 1943 earnings data for certain occupational groups—for example, class A and B maintenance workers—have therefore been combined, for purposes of comparison, to conform with data presented in the 1941 study. On the whole, the occupations for which comparisons are made are believed to represent workers whose occupational duties and responsibilities were similar.

#### MINING AND MILLING

A comparison of average hourly earnings for 24 individual occupations in the mining and milling division of the nonferrous-metals industry reveals that every group of workers represented experienced an appreciable increase between August 1941 and June 1943 (table 10). Although average wage increases ranged from a low of 8 percent for truck drivers to a high of 35 percent for muckers, there was, in general, a considerable degree of uniformity from one occupation to another in the percentage of change. Sixteen of the 24 occupations showed increases of 15 to 25 percent. Increases of over 21 percent were found in half of the jobs, the remainder receiving less than that amount. Increases of less than 15 percent were found in only 4 occupations. The relatively large increase for muckers, as has been indicated, was due in part to substantial gains in incentive earnings and to other special factors operating in certain regions.

TABLE 10.—*Straight-Time Average Hourly Earnings of Workers in Selected Occupations in Mining and Milling of Nonferrous Metals, August 1941 and June 1943*

Occupation	Average hourly earnings		Occupation	Average hourly earnings	
	1941	1943		1941	1943
Maintenance:			Inspection and testing:		
Blacksmiths.....	\$0. 776	\$0. 930	Samplers, ore, mine.....	\$0. 752	\$0. 850
Carpenters.....	. 831	. 965	Samplers, mill.....	. 677	. 824
Electricians.....	. 828	1. 005	Recording and control: Time-		
Processing—Mining:			keepers.....	. 876	1. 012
Cagers, inside.....	. 763	. 933	Material movement:		
Drilling-machine operators...	. 849	. 937	Hoistmen.....	. 749	. 927
Loading-machine operators...	. 834	. 929	Motormen, inside.....	. 785	. 947
Muckers.....	. 666	. 897	Tractor and truck operators...	. 706	. 858
Pumpmen.....	. 720	. 902	Trammers.....	. 632	. 782
Timbermen.....	. 776	. 981	Truck drivers.....	. 774	. 838
Trackmen.....	. 721	. 849	Custodial:		
Processing—Milling:			Change-house men.....	. 611	. 782
Ball-mill operators.....	. 723	. 871	Watchmen.....	. 644	. 747
Crusher operators.....	. 694	. 810			
Flotation operators.....	. 745	. 901			
Jig operators.....	. 692	. 818			

## PRIMARY SMELTING AND REFINING

Table 11 presents comparative data for selected occupations in primary smelting and refining establishments. For convenience in presentation, data for all branches of the industry are shown in one tabulation. The occupations listed are not, of course, found in all branches. It has been necessary, moreover, to omit the wage data for certain occupations because of differences in definition or in the areas surveyed in the two periods.

As in mining and milling, wage increases were realized by workers in all occupations which were covered during both of the periods studied, and for which comparative wage data are shown in table 11. In general, however, the increases in average hourly earnings in most smelting and refining occupations were lower than in the mining and milling occupations studied.

On a relative basis, workers in the occupations studied in copper smelting establishments enjoyed greater wage increases than those employed in lead and zinc smelting plants. Percentage increases in average hourly earnings in copper smelting were relatively uniform and ranged from 15 percent for machinists to about 25 percent for reverberatory-furnace chargers. The percentage wage increases in lead and zinc smelting, on the other hand, varied considerably from one occupation to another, ranging in lead smelting from 2 percent for casting-machine operators to 22 percent for samplers, and in zinc smelting from 5 percent for retort chargers to slightly more than 28 percent for watchmen. The median increases among the occupations represented were copper smelting, 18 percent; zinc smelting, 12 percent; lead smelting, 17 percent. For the occupations studied in the electrolytic refining of copper and in electrolytic zinc production, the range in the amount of the wage increases between the various occupations was also relatively great. In electrolytic copper refining, however, workers in 14 of the 20 occupations for which comparisons are shown had increases in average hourly earnings of 10 to 20 percent from August 1941 to June 1943. The median increase was 14 percent. In the electrolytic production of zinc,

comparisons are shown for only 7 occupations; the increases in average hourly earnings ranged from 5 percent for samplers to 27 percent for filter operators. Strippers, who constituted the largest occupational group in electrolytic zinc production, received an 18-percent increase in average hourly earnings between August 1941 and June 1943.

TABLE 11.—Straight-time Average Hourly Earnings of Workers in Selected Occupations in Primary Smelting and Refining of Nonferrous Metals, August 1941 and June 1943

Occupation	Straight-time average hourly earnings— Smelting						Electrolytic copper refining		Electrolytic production of zinc	
	Copper		Zinc		Lead		1941	1943	1941	1943
	1941	1943	1941	1943	1941	1943				
<b>Maintenance:</b>										
Carpenters.....	\$0.890	\$1.037	\$0.939	\$1.044	\$0.859	\$1.033	\$0.939	\$1.080	\$0.874	\$1.076
Electricians.....	.901	1.045	.977	1.065			.929	1.058		
Gas-producer operators.....			.914	1.039						
Machinists.....	.901	1.032	.967	1.064	.839	1.017	.962	1.089		
<b>Processing:</b>										
Bag-house operators.....					.798	.944				
Blast-furnace operators.....					.870	.896				
Blast-furnace tappers.....					.793	.893				
Casting-machine operators.....	.749	.866			.926	.940	.846	.960		
Chambermen (acid department).....			.978	1.052						
Chargers, retorts, hand.....			.959	1.003						
Chisellers.....			1.862	.925						
Circulation men, tanks.....							.795	.903		
Connie boys.....			1.824	.897						
Converter punchers.....	.710	.849								
Cottrell operators.....	.769	.953								
Electrolytic-tank operators.....							.826	.940	.860	.966
Filter operators.....									.792	1.007
Furnace operators.....							.859	.969	.903	.979
Hot-sheet men.....							.791	.835		
Ladlers.....							.866	.896		
Leach operators.....							.820	.928		
Lead burners (acid department).....			1.216	1.287						
Loamers.....			.864	.933						
Loopers and punchers.....							.829	.970		
Metal drawers.....			.938	1.007						
Mill operators (crush, grind, and mix).....			.785	.911						
Retort firemen.....			.990	1.112						
Reverberatory-furnace chargers.....	.673	.840					.893	.938		
Reverberatory-furnace operators.....	.783	.933					.863	1.006		
Reverberatory-furnace tappers.....	.728	.891								
Roaster and sinter firemen.....			.850	1.036	.741	.828	.804	.830		
Stampers.....			.853	.958						
Strippers.....							.852	1.008	.842	.990
Washers and cleaners.....							.734	.904		
<b>Inspection and testing:</b>										
Samplers.....	.711	.832	.759	.897	.722	.878	.777	.902	.870	.912
Voltmeter men (tank-house).....							.785	.834		
<b>Recording and control:</b>										
Weighers, copper.....							.810	.908		
Weighers, metal.....			.798	.896	.808	.943				
<b>Material movement:</b>										
Crane followers.....	.732	.857								
Crane operators, electric bridge.....	.819	.969			.789	.934				
Motormen.....			.775	.897	.746	.875				
<b>Custodial:</b>										
Janitors.....	.670	.810	.693	.827	.713	.798	.685	.818	.726	.796
Watchmen.....	.671	.768	.697	.893	.675	.766				

<sup>1</sup> Revised figure.

## SECONDARY SMELTING

Increases in average hourly earnings for selected occupations studied in secondary smelting operations ranged from 8 percent for weighers to 27 percent for briquetting-machine operators (table 12). Average hourly earnings for the two largest occupational groups—furnace operators and furnace operators' helpers—were increased 15 percent and 9 percent, respectively. Scrap sorters, also accounting for a large number of workers during both periods studied, received an increase in earnings averaging 14 cents an hour, or a relative increase of 21 percent, between August 1941 and June 1943.

TABLE 12.—*Straight-Time Average Hourly Earnings of Workers in Selected Occupations in Secondary Smelting of Nonferrous Metals, August 1941 and June 1943*

Occupation	Average hourly earnings		Occupation	Average hourly earnings	
	1941	1943		1941	1943
Briquetting-machine operators.....	\$0. 649	\$0. 824	Scrap sorters.....	\$0. 653	\$0. 790
Furnace operators.....	. 770	. 882	Truck drivers.....	. 715	. 886
Furnace operators' helpers.....	. 733	. 799	Truckers, hand.....	. 697	. 769
Janitors.....	. 606	. 748	Watchmen.....	. 560	. 638
Samplers.....	. 686	. 799	Weighers.....	. 787	. 852