UNITED STATES DEPARTMENT OF LABOR
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BUREAU OF LABOR STATISTICS
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A. F. Hinrichs, *Acting Commissioner*

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Wages in Iron Mining
October 1943

Prepared by the
DIVISION OF WAGE ANALYSIS
ROBERT J. MYERS, Chief

Bulletin No. 787

[Reprinted from the Monthly Labor Review, June 1944]

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Letter of Transmittal

UNITED STATES DEPARTMENT OF LABOR,
BUREAU OF LABOR STATISTICS,
Washington, D. C., June 20, 1944.

The SECRETARY OF LABOR:

I have the honor to transmit herewith a report on wages in iron mining, October 1943. The report was prepared by Edith M. Olsen under the direction of Victor S. Baril, of the Division of Wage Analysis, Robert J. Myers, Chief.

A. F. HINRICHS, *Acting Commissioner.*

Hon. FRANCES PERKINS,
Secretary of Labor.

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Bulletin No. 787 of the

United States Bureau of Labor Statistics

[Reprinted from the MONTHLY LABOR REVIEW, June 1944]

Wages in Iron Mining, October 1943

Summary

OCCUPATIONAL wage data obtained by the Bureau of Labor Statistics in a study of the iron-mining industry in October 1943 reveal that for the industry as a whole, straight-time average hourly earnings of workers in the occupations covered amounted to 92.8 cents. Earnings for workers in selected occupations varied from 69.6 cents an hour for watchmen to $1.342 an hour for operators of power shovels in open-pit mines. Nearly half of the workers covered were concentrated in occupations for which average earnings ranged from 80 to 90 cents an hour. Contract miners, who constituted more than a fourth of the workers, were paid average hourly earnings amounting to $1.08 an hour.

Substantially different wage levels were found among iron-mining areas. In general, the highest rates were paid in the Western region, the next highest in the Lake Superior region, and the lowest in the Southeastern region. The respective regional averages were: West, $1.029; Lake Superior, 95.6 cents; Northeast, 90.0 cents; and Southeast, 80.4 cents.

Characteristics of the Industry

The prodigious demands of mechanized warfare have demonstrated once more the vital importance of iron and steel in the life of any Nation, and have called attention to a segment of our greatest industry that is frequently neglected—the mining of iron ore. Of the basic materials which enter into the manufacture of iron and steel, iron ore is, of course, the most important, as it represents over half of the solid materials charged into a blast furnace to produce the pig iron which is the intermediate product in the manufacture of iron and steel.

Iron mining in the United States began in New England in the early colonial period. Ore was obtained from bogs or extracted by crude hand methods from outcrops and shallow pits. With the exhaustion of these readily accessible sources of supply, various methods of underground mining were adopted. Prior to the discovery of the rich and easily mined ore deposits in the Lake Superior region about the middle of the last century, iron-ore mining was confined to the Atlantic seaboard—particularly to New York, New Jersey, and Pennsylvania. The development of the Lake Superior ore bodies was hastened during the second half of the nineteenth century by the rising demand for iron and steel to meet the needs of the industrial

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development and westward expansion of the country, and by the shift of the iron and steel industry from the East to western Pennsylvania and other States bordering on the Great Lakes, where large supplies of coking coal were available. The disadvantages of transporting iron ore over great distances to blast furnaces is offset by cheap and efficient water transportation on the Great Lakes and by the proximity of the steel industry to its fuel supplies.

The irregular but rapid expansion of the iron-ore mining industry since 1880 is clearly indicated by the production data presented in table 1 for the country as a whole and for the principal producing areas.

TABLE 1.—*Production of Iron Ore, by District, 1880–1943*[1]

Year	United States total (in thousands of gross tons)	Percent of total production					
		Lake Superior district			Alabama	New York, New Jersey, and Pennsylvania	All other States
		Total	Minnesota	Michigan and Wisconsin			
1880	7,120	23.6	----------	23.6	2.4	52.7	21.3
1890	16,036	56.1	5.6	50.5	11.8	19.4	12.7
1895	15,958	64.7	24.2	40.5	13.8	9.3	12.2
1900	27,553	74.4	35.7	38.7	10.0	6.0	9.6
1905	[2]42,526	78.7	51.1	27.6	8.9	5.8	6.6
1910	57,015	81.3	56.0	25.3	8.4	4.5	5.8
1915	55,526	84.8	60.3	24.5	9.5	3.2	2.5
1920	67,604	85.7	58.4	27.3	8.7	3.1	2.5
1921	29,491	86.0	60.4	25.6	9.7	2.3	2.0
1922	47,129	84.4	61.0	23.4	11.1	2.8	1.7
1923	69,351	85.7	64.0	21.7	9.8	2.6	1.9
1924	54,267	82.8	58.8	24.0	12.9	2.1	2.2
1925	61,908	84.2	59.5	24.7	11.5	2.1	2.2
1926	67,623	84.7	60.2	24.5	10.1	2.9	2.3
1927	61,741	83.6	57.4	26.2	10.4	3.6	2.4
1928	62,197	84.5	60.4	24.1	10.1	3.2	2.2
1929	73,028	86.1	62.7	23.4	8.8	3.0	2.1
1930	58,409	84.6	59.1	25.5	9.8	3.8	1.8
1931	31,132	83.1	56.0	27.1	11.6	3.0	2.3
1932	9,847	82.7	52.3	30.4	14.0	1.6	1.7
1933	17,553	83.3	68.1	15.2	12.2	2.2	2.3
1934	24,588	85.5	62.6	22.9	9.6	3.7	1.2
1935	30,540	83.1	63.5	19.6	10.7	4.4	1.8
1936	48,789	85.6	64.8	20.8	8.6	4.2	1.6
1937	72,094	85.5	67.1	18.4	8.7	4.4	1.4
1938	28,447	74.9	50.8	24.1	15.1	8.1	1.9
1939	51,732	80.5	60.9	19.6	11.5	6.1	1.9
1940	73,696	83.5	64.9	18.6	9.9	4.8	1.8
1941	92,410	85.4	68.0	17.4	8.5	4.3	1.8
1942	107,012	86.2	69.9	16.3	8.3	3.6	1.9
1943	[3]100,765	85.6	68.6	17.0	8.1	3.4	2.9

[1] Data for tons produced for 1880–1929 are from 15th Census of the United States, 1930: "Mines and Quarries, 1929" (U. S. Department of Commerce, Bureau of Census, 1933); for 1930–43, from Bureau of Mines, U. S. Department of Interior.
[2] After 1905, exclusive of ore containing 5 percent or more manganese.
[3] Preliminary figure.

As late as 1880, over half of the domestic iron ore produced was mined in the States of New York, New Jersey, and Pennsylvania, and less than a fourth came from the Lake Superior region. Within 10 years, however, the Lake Superior region accounted for well over half of all the iron ore produced, and by 1900 it accounted for three-fourths of the total. During these two decades the percentage of total production mined in the States of New York, New Jersey, and

Pennsylvania dropped from 52.7 to 6.0 and that for all other States, except Alabama, declined from 21.3 to 9.6. In the same period, the percent of total production mined in Alabama increased substantially. Since 1900, the percentage of all iron ore mined in the Lake Superior region has steadily increased until today this region accounts for nearly seven-eighths of the national output. Of the other States in which iron ore is mined, only Alabama has been able to maintain its relative position as a producer of iron ore.

Today, iron ore is mined to some extent in about 20 States. The bulk of the production, however, is concentrated in the Lake Superior, the Southeastern, and the Northeastern districts. More than 100,000,000 tons of ore were mined in 1943.

More than 85 percent of the iron ore mined in the United States in 1943 came from the Lake Superior district, which includes mines in Minnesota, Michigan, and Wisconsin. Minnesota, the most important producing State, supplied almost 70 percent of the total domestic output for 1943. Michigan, the second largest producer, supplied about 15 percent, and Wisconsin somewhat less than 2 percent. There are six ranges, or groups, of ore bodies in the Lake Superior district—the Mesabi, Menominee, Marquette, Cuyuna, Gogebic, and Vermillion. The Mesabi Range, in Minnesota, alone accounts for about two-thirds of the ore shipped from the Lake Superior district. A substantial proportion of the iron ore produced in the district, particularly in Minnesota, comes from economical open-pit mines.

The Southeastern district, including Alabama, Georgia, and Virginia, contributed about 8.3 percent of the domestic iron-ore output of 1943. The greater part of the ore produced in this district comes from underground mines near Birmingham, Ala. Despite the fact that the ore deposits in the Birmingham area are of relatively low iron content, exploitation is profitable because of their favorable location with respect to coal deposits and blast-furnace operations, and also because of the self-fluxing nature of the ore.

The Northeastern district, which includes mines in New Jersey, New York, and Eastern Pennsylvania, accounted for only 3.4 percent of the 1943 iron-ore production. The decline in the importance of this district has been due to inability to compete with the more economical operations of the Lake Superior district, rather than to depletion of ore bodies. Increased demand for ores to supply eastern furnaces has recently brought about the reopening of a number of old mining properties. It is expected that this region will be of increasing importance in the future iron-mining industry of the country.

Most of the iron ore produced in the Western States comes from the mines of Wyoming, Utah, and California. Although the western iron-ore mines accounted for less than 3 percent of the domestic output for 1943, their production represented a sharp increase over 1942. Ore from these mines is used to supply the needs of nearby blast furnaces, a number of which have been put into operation since the beginning of the war.

MINING METHODS

Iron ore is a chemical compound of iron and oxygen. Magnetite, hematite, and limonite are the most commonly used grades of ore and,

when pure, contain the highest percentage of iron. Because of the impurities, known as gangue, which are always found with the ores as they occur naturally in the ground, the iron content varies greatly from one locality to another. The Lake Superior ores are chiefly hematite of a relatively high grade. The bulk of the total output of limonite, or brown ore, comes from Alabama, but the greatest proportion of the ores mined in that State consists of red hematite of a lower iron content than the Lake ores. The ores of New York, Pennsylvania, and New Jersey consist almost exclusively of high-grade magnetite.

Iron ore is extracted by either open-pit or underground mining. The former is a comparatively simple method which is used where the deposits are relatively soft and near the surface. The "overburden" or earth covering the ore deposits is first removed by large power shovels. The ore is then loosened and loaded directly into cars and is usually hauled out of the pits by locomotives. Some open-pit mines, however, employ trucks, tractors, or belt-conveyors for haulage. Nearly all of the early mining districts were first exploited by open-pit excavations. The amount of ore accessible to open-pit mining with existent equipment was, however, soon exhausted in most of these early districts, and it became necessary to adopt the more costly underground methods.

With the discovery of the Mesabi Range in Minnesota, in 1890, open-pit mining was revived because of the favorable position of the huge ore deposits in this area. Technological improvements and heavy capital investments of large operating companies brought about continued expansion of open-pit mining there, and a steady increase in the proportion of the total output produced by open-pit mining methods. About three-fourths of the iron ore mined in the United States in 1942 came from open-pit mines.

Largely as a result of the expansion of open-pit mining and the general improvements in mining techniques in both underground and open-pit operations, labor productivity in the iron-mining industry as a whole has increased steadily in the past half century. Output per man is much greater in open-pit operations, which are highly mechanized, than in underground operations, which cannot be so extensively mechanized.

It is sometimes necessary to improve the chemical composition or physical structure of iron ore before shipment to the blast furnace. Any process or method of treatment which improves the quality of the ore is called "beneficiation." The physical structure may simply be improved by crushing large lumps into smaller particles, or by agglomerating fine particles into balls or lumps. The chemical composition may be improved by various methods of concentration in which waste materials are eliminated in order to increase the proportion of iron in the material shipped from the mines.

THE LABOR FORCE

Approximately 6 out of every 10 workers in iron-ore mining operations are employed in processing occupations either in the mines or on the surface. The remainder of the labor force is engaged in maintenance, material movement, and other auxiliary work. In the underground mines, "company miners" and "contract miners" together comprise more than two-thirds of the workers in the processing occu-

pations.[1] These workers and timbermen (who constitute the second largest group) account for about one-tenth of the processing workers. About 8 out of every 10 of the workers in open-pit processing operations are employed as churn-drill operators, drilling-machine operators' helpers, grader operators, shovel operators, shovel oilers, and trackmen.

Because of the nature of most of the production jobs, women are not generally employed at iron-mining operations except as office workers. At the time of the Bureau's survey, only 25 women, most of whom were employed at one mine, were found in the production occupations selected for study. These workers were all engaged in surface occupations and, with but two exceptions, were paid the same hourly rate as male workers performing similar duties.

The training of inexperienced workers on the job has enabled iron-mining operations in most regions to maintain an adequate labor force during the war. Although the supply of experienced mine workers has been exhausted in the effort to meet production schedules, manpower shortages have become very critical only in the Northeastern mining States. Production of the mines in this region fell short of their anticipated output for 1943 largely because of insufficient labor. Recruitment of workers is more difficult in these States than in other mining areas because of the greater competition of other industries and the small local supply of experienced miners.

UNIONIZATION OF LABOR

The working force employed in the iron-ore mining industry is very extensively organized by labor unions. At the time of the Bureau's wage survey, approximately nine-tenths of the workers employed in the establishments studied were covered by union agreements. In the Lake Superior region, 65 of the 68 mines studied were operating under collective-bargaining agreements with locals of the United Steel Workers of America, affiliated with the C. I. O. These 65 mines employed virtually all of the workers for whom detailed earnings data were obtained. Two very small mines in this region were operating without union agreements, and the workers in a third mine were represented by locals affiliated with the A. F. of L.

While only about half of the establishments covered in the Southeastern district reported union agreements, these establishments accounted for fully nine-tenths of the workers studied in the region. All of the organized workers in the Southeastern district were represented by the International Union of Mine, Mill and Smelter Workers, which is also a C. I. O. affiliate.

Of the nine mines studied in the Northeastern States, three had collective agreements with the United Steel Workers of America and one with the International Union of Mine, Mill and Smelter Workers; two were operating under agreements with locals affiliated with the A. F. of L. The other three mines covered in this region had no union agreements at the time of the survey. In the Western region, workers in three of the seven mines studied were represented by nationally affiliated unions. These three mines employed nearly nine-tenths of the workers studied in this region.

[1] "Contract "miners are usually engaged in production work, i. e., the extraction of ore only, and are paid on a contract or incentive basis (a stipulated amount per ton, cubic yard, or car of ore mined). "Company" miners are paid on a time basis and are usually engaged in development work or in the performance of work which does not lend itself to payment on an incentive basis.

Scope and Method of Wage Survey

The data presented in the following pages were obtained by the Bureau of Labor Statistics in the course of a general survey of occupational wage rates in the metal-mining industry. The chief purpose of this survey was to provide current basic wage information for use in the wage-stabilization program. The present report deals with the wage structure of the iron-mining industry, and covers both open-pit and underground mines, as well as the ore-beneficiating plants operated at the mines. An earlier study analyzed the earnings of workers employed in nonferrous-metal mines and mills.[2]

The wage data on which this report is based were obtained from pay-roll and other basic records by experienced field representatives of the Bureau. Complete coverage of all wage earners in the industry was not attempted. Information on average hourly earnings, excluding premium payments for overtime and late-shift work, was collected for workers in selected key occupations. These selected occupations, which are believed to represent adequately the wage structure of the industry, accounted for about 70 percent of the total number of wage earners employed in the mining operations studied. All occupational classifications were determined on the basis of standard job descriptions which were used in each of the establishments studied. The duties performed by workers included within the individual occupations are therefore believed to be closely comparable.

In addition to the occupational wage data for each establishment, information was also obtained on the number of shifts operated, the method of wage payment for workers employed in each occupation, entrance rates paid to male common labor, the extent of unionization, and the policy of each company concerning the payment of overtime and differentials for work on late shifts. The earnings data relate to typical pay-roll periods in October 1943.

The survey was made on the basis of a representative sample of iron-ore mines employing 9 or more wage earners. After careful consideration had been given to geographic location, size and type of operation, and corporate affiliation, 109 mines, operated by 40 separate companies, were selected for study. Sixty-eight of these mines were in the Lake Superior district, 25 in the Southeast, 9 in the Northeast, and 7 in the Western States.

The proportionate representation of the sample varied from one region to another, depending upon the concentration of the industry. Thus, in the Lake Superior district, 25 percent of all operations were studied, while in the Southeastern district a 50-percent sample of all operations was selected. In the Northeastern and Western regions, however, where the few operations are more widely scattered, nearly all of the mines employing 9 or more wage earners were included in the survey. Because of the difference in the size of the sample studied in the various regions, the data have been weighted in arriving at figures for the country as a whole, in order to assure appropriate representation of all regions. Thus weighted, the average hourly earnings shown relate to all workers (approximately 24,000) in the selected occupations covered in 250 mines. Total employment in the iron-mining industry for October 1943, including the occupations not covered in the survey, is estimated to be about 33,000.

[2] See Monthly Labor Review, November 1943 (p. 971): Wages in Nonferrous-Metal Mining and Milling, June 1943.

Hourly Earnings

WAGE-PAYMENT PRACTICES

Wage earners in most occupations in iron-ore mines are paid on a time basis. Incentive-wage plans, however, are typically used to determine the earnings of workers employed as contract miners, loading-machine operators, and muckers. These workers are paid on a tonnage or footage basis and are guaranteed a minimum base rate. Somewhat more than three-tenths of the workers studied in the survey were employed in occupations in which incentive payment prevails.

The majority of the mines included in the survey reported the operation of more than one shift. Approximately 62 percent of the workers studied were employed on the first, or daylight, shift, 23 percent on the second shift, and only 15 percent on the third, or night shift. The payment of shift premiums is not common practice in the iron-mining industry. Only two mines reported differential payment to workers on the second or third shift. Periodic rotation of shifts was found in nearly three-fourths of the establishments covered.

Each of the mines included in the study paid workers at the rate of time and a half for all work above 40 hours a week. Workers in 90 of the mines were also paid this overtime rate for hours in excess of 8 a day, although 8 hours constituted the normal workday for a substantial portion of the industry. In 93 of the mines, workers were compensated for holiday work at the rate of time and a half.

ENTRANCE RATES FOR MALE COMMON LABOR

All but 7 of the 109 mines covered during the survey reported established entrance rates for male common labor. The wide range in these rates, from 30 to 89.5 cents an hour, resulted largely from regional differences in general wage levels. Some of the variation is also due to the fact that common labor employed at underground mining operations is customarily paid a slightly higher hourly rate for work inside the mine than that established for comparable work on the surface. In the Lake Superior district, 65 of the 68 mines studied paid a minimum entrance rate of 78 cents an hour for common labor working above ground, while the majority of the 21 underground mines in this region paid either 81 cents or 81.5 cents an hour for underground common labor. In the Southeastern district the rates paid to common labor in open-pit operations ranged from 30 cents to 55 cents an hour, and in underground operations from 60.5 to 65.5 cents an hour. Common-labor rates for underground work in the Northeastern mines were between 65.5 and 81 cents an hour. For the mining operations studied in the Western States, rates ranging from 40 cents to 89.5 cents an hour were paid to common labor. This extreme variation in rates is due partly to size of operation, but largely to location, as these Western operations are widely scattered geographically. In the Southeastern, the Northeastern, and the Western districts, as in the Lake Superior region, slightly higher common-labor rates were paid for underground work than for surface work.

TREND OF HOURLY EARNINGS

The level of hourly earnings in iron mining, as in other industries, has risen substantially since the outbreak of the war. Gross average hourly earnings, as reported to the Bureau monthly by a number of mines, rose from 75 cents in January 1941 to 97 cents in October 1943, or by about 29 percent. This increase, however, was due in part to an increased amount of overtime work at premium rates. Eliminating the influence of this factor from both the January 1941 and the October 1943 averages, it is estimated that the increase in straight-time average hourly earnings was about 23 percent. Much of this increase occurred during the spring of 1941, when two large companies in the Lake Superior region granted a flat increase of 10 cents an hour.

The above average hourly earnings, it should be pointed out, are based on gross earnings for all workers in the industry and, for that reason, should not be confused with the straight-time hourly earnings presented later in this report for workers in selected occupations.

HOURLY EARNINGS BY OCCUPATION

The basic wage information obtained during the present survey is shown by region in table 2. The number of workers and average hourly earnings, excluding shift differentials and premium payments for overtime work, are shown for 57 selected occupations in underground and open-pit mining operations. The employment figures for each region are weighted to represent approximately all of the workers in the occupations for which earnings data are shown. The processing occupations are shown separately for underground and open-pit mines, and for surface operations. Some of the surface operations are common to both types of mines. As stated earlier, the earnings data represent more than 24,000 workers, or approximately 70 percent of the wage earners employed in the iron-mining industry in October 1943.

For the iron-mining industry as a whole, straight-time average hourly earnings of first-shift workers in the occupations covered in this survey amounted to 92.8 cents. Individual occupational averages ranged from 69.6 cents an hour for watchmen to $1.342 an hour for operators of power shovels in open-pit mines. Earnings in excess of $1.00 an hour were paid only to contract miners, locomotive crane operators, locomotive engineers, and power-shovel operators. Fully one-fourth of all workers covered were classified as contract miners, and their average earnings amounted to $1.08 an hour. The high earnings of these workers in relation to those of workers in other underground occupations reflect the influence of incentive wage payments. In contrast, company miners, who were all paid on a straight hourly basis, averaged only 88 cents an hour. Approximately one-sixth of the workers were engaged in the 13 occupations for which average hourly earnings ranged from 90 cents to $1.00, and nearly one-half were in the 30 occupations for which earnings averaged from 80 to 90 cents an hour. Workers in 10 occupations received average earnings amounting to less than 80 cents an hour; these occupations, however, accounted for only about one-tenth of the workers.

On the whole, maintenance workers had slightly higher earnings than workers in the processing and material-movement groups of occupations. Moreover, within the processing group of occupations workers engaged in underground and pit operations earned slightly more per hour than workers in surface operations. In the custodial group, watchmen and change-house men were among the lowest-paid workers in the industry.

It should be pointed out that general averages for the country as a whole do not reflect regional differences in occupational structure and wage levels and, therefore, have only limited significance. Moreover, in the iron-mining industry, the general averages are profoundly affected by the earnings of workers in the Lake Superior district, since nearly three-fourths of the workers were employed in mines in this region.

REGIONAL WAGE LEVELS

Substantially different wage levels were found among regions. In general, the highest rates were found in the West, the next highest in the Lake Superior region, and the lowest in the Southeastern region. On the whole, wages in the Northeastern region were substantially lower than those in the Lake Superior region, but somewhat higher than those in the Southeastern region. For example, in 12 of 16 occupations for which figures are shown for the West and the Lake Superior region, earnings were higher in the former region. Similarly, in 32 of 40 occupations for which figures are available, the Lake Superior region showed higher earnings than the Southeastern region. Average hourly earnings, by region, for all selected occupations combined were as follows:

	Average hourly earnings
Lake Superior	$0.956
Southeast	.804
Northeast	.900
West	1.029

Lake Superior region.—Occupational average hourly earnings in this region varied from 76.2 cents for watchmen to $1.49 for power-shovel operators. Fully three-fifths of the workers covered in the region were engaged in the 22 occupations for which the average earnings amounted to 90 cents an hour or more, and somewhat more than one-third of the workers were in occupations having average earnings between 80 and 90 cents an hour. Earnings below 80 cents an hour were paid to workers in three processing occupations, namely, muckers in underground mines and pitmen and trackmen in open-pit mines, and to change-house men and watchmen in the custodial group of occupations.

Iron-ore mines in Minnesota, which include the operations of the Mesabi, Cuyuna, and Vermillion ranges, accounted for more than half of the workers studied in the Lake Superior district. Forty-five percent of the workers covered in Minnesota mines were concentrated in occupations having average earnings within the range of 90 cents to $1.00 an hour, and one-fifth of the workers, the majority of whom were contract miners, were in occupations with average earnings in excess of $1.00 an hour. The lowest hourly rate for any of the processing occupations was paid to trackmen in the open-pit mines, who averaged 78.1 cents. In only two other occupations, change-house men and watchmen, did workers average less than 80 cents per hour.

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

Occupation	United States total		Lake Superior district						
			Total		Minnesota				
					Total		Mesabi Range		Other ranges
	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
Maintenance									
Maintenance mechanics	738	$0.877	557	$0.887	253	$0.906	213	$0.902	40
Automotive mechanics	210	.956	158	.999	158	.999	118	.985	40
Bit grinders	111	.850	70	.845	38	.864	1	(2)	37
Blacksmiths	210	.918	172	.943	86	.988	47	.987	39
Carpenters	379	.886	302	.905	138	.935	92	.938	46
Car repairmen	77	.809	54	.841	50	.840	41	.835	9
Electricians	448	.940	374	.941	224	.965	143	.980	81
Mechanical helpers	596	.813	429	.842	313	.848	218	.845	95
Machinists	241	.947	201	.957	121	.999	62	1.017	59
Welders	176	.979	162	.982	138	.994	110	.989	28
Supervision									
Working foremen	474	.955	217	.985	133	.993	124	.994	9
Processing, underground									
Cagers, inside	464	.842	360	.850	90	.840	30	.845	60
Loading-machine operators	574	.946	166	.853	12	.845	12	.845	-------
Miners, company	955	.880	675	.881	57	.855	57	.855	-------
Miners, contract	6,274	1.080	5,147	1.081	1,211	1.101	693	1.101	518
Muckers	741	.834	56	.798	-------	-------	-------	-------	-------
Pumpmen	363	.826	277	.834	31	.845	21	.845	10
Timbermen	1,000	.811	464	.908	176	.906	24	.878	152
Trackmen	244	.755	58	.862	4	(2)	-------	-------	4
Processing, open-pit									
Blasters	74	.904	62	.908	62	.908	56	.907	6
Blasters' helpers	41	.843	37	.839	37	.839	37	.839	-------
Crane operators, locomotive	45	1.178	35	1.142	35	1.142	35	1.142	-------
Drilling-machine operators, production, outside, churn	354	.909	339	.908	319	.915	286	.915	33
Drilling-machine operators, production, outside, jack hammer and mounted	97	.863	43	.877	43	.877	43	.877	-------
Drilling-machine operators' helpers, outside	330	.822	309	.821	293	.825	266	.825	27
Grader operators	292	.932	255	.956	255	.956	219	.957	36
Pitmen	95	.710	65	.792	41	.830	41	.830	-------
Pumpmen	75	.833	73	.843	73	.843	73	.843	-------
Shovel oilers	366	.872	322	.918	314	.921	272	.922	42
Shovel operators	471	1.342	367	1.490	355	1.500	307	1.500	48
Trackmen	411	.779	388	.781	372	.781	366	.780	6
Processing, surface									
Car loaders	435	.786	368	.807	116	.831	88	.835	28
Crusher operators	234	.836	156	.869	122	.891	97	.904	25
Dumpmen	61	.719	18	.845	12	(2)	12	(2)	-------
Engineers, stationary	108	.815	65	.836	13	.836	9	(2)	4
Firemen, stationary boiler	46	.794	21	.828	3	(2)	3	(2)	-------
Millmen	131	.805	118	.803	118	.803	118	.803	-------
Plant operators	269	.843	232	.858	232	.858	232	.858	-------
Pumpmen, concentrating	39	.795	20	.818	20	.818	20	.818	-------
Screener operators	108	.863	85	.878	85	.878	85	.878	-------
Inspection and testing									
Samplers	334	.832	290	.832	232	.842	205	.843	27

See footnotes at end of table.

Selected Occupations in Iron-Ore Mines, by Region,[1] October 1943

Lake Superior district—Continued			Southeast		Northeast		West		Occupation
Minnesota—Con.	Michigan and Wisconsin								
Other ranges—Con.									
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	
									Maintenance
$0.928	304	$0.871	76	$0.827	94	$0.840	11	$1.036	Maintenance mechanics.
1.041	------	------	42	.765	1	(2)	9	(2)	Automotive mechanics.
.864	32	.823	7	.946	34	.841	------	------	Bit grinders.
.989	86	.898	13	.671	15	.835	10	.929	Blacksmiths.
.928	164	.879	9	.623	63	.827	5	.951	Carpenters.
.862	4	(2)	23	.735	------	------	------	------	Car repairmen.
.937	150	.905	21	1.038	44	.857	9	1.061	Electricians.
.854	116	.826	81	.707	66	.737	20	(2)	Mechanical helpers.
.980	80	.893	6	.983	31	.869	3	(2)	Machinists.
1.013	24	.914	6	.692	1	(2)	7	1.168	Welders.
									Supervision
(2)	84	.972	121	.856	117	1.019	19	(2)	Working foremen.
									Processing, underground
.838	270	.854	26	.803	70	.816	8	(2)	Cagers, inside.
------	154	.854	281	.953	127	1.052	------	------	Loading-machine operators.
------	618	.883	46	(2)	178	.893	56	(2)	Miners, company.
1.102	3,936	1.074	722	1.021	362	1.101	43	(2)	Miners, contract.
------	56	.798	633	.836	52	.844	------	------	Muckers.
.845	246	.832	68	.795	15	.818	3	(2)	Pumpmen.
.911	288	.908	434	.697	79	.849	23	(2)	Timbermen.
(2)	54	.862	156	.706	26	.789	4	(2)	Trackmen.
									Processing, open-pit
(2)	------	------	------	------	9	(2)	3	1.092	Blasters.
------	------	------	------	------	------	------	4	(2)	Blasters' helpers.
------	------	------	------	------	1	(2)	9	(2)	Crane operators, locomotive.
(2)	20	.793	6	.673	------	------	9	1.123	Drilling-machine operators, production, outside, churn.
------	------	------	10	.460	27	(2)	17	1.034	Drilling-machine operators, production, outside, jack hammer and mounted.
(2)	16	.754	4	.463	------	------	17	.917	Drilling-machine operators' helpers, outside.
(2)	------	------	26	.660	1	(2)	10	1.032	Grader operators.
------	24	.727	28	.543	------	------	2	(2)	Pitmen.
------	------	------	2	(2)	------	------	------	------	Pumpmen.
(2)	8	(2)	38	.474	4	(2)	2	(2)	Shovel oilers.
(2)	12	1.187	94	.791	6	(2)	4	1.250	Shovel operators.
(2)	16	(2)	8	(2)	15	(2)	------	------	Trackmen.
									Processing, surface
.815	252	.796	46	.621	15	.697	6	(2)	Car loaders.
.844	34	.787	21	.738	54	.765	3	1.100	Crusher operators.
------	6	(2)	13	.791	30	(2)	------	------	Dumpmen.
(2)	52	.837	29	.801	14	.746	------	------	Engineers, stationary.
------	18	.830	18	.743	7	.825	------	------	Firemen, stationary boiler.
------	------	------	6	(2)	7	.760	------	------	Millmen.
------	------	------	------	------	37	.743	------	------	Plant operators.
------	------	------	6	(2)	13	.761	------	------	Pumpmen, concentrating.
------	------	------	6	(2)	17	.831	------	------	Screener operators.
									Inspection and testing
.834	58	.792	17	.878	18	.791	9	.826	Samplers.

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

Occupation	United States total		Lake Superior district						
			Total		Minnesota				
					Total		Mesabi Range		Other ranges
	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
Recording and control									
Timekeepers	53	$0.881	23	$0.951	19	$0.950	19	$0.950	-------
Material movement									
Brakemen, inside	464	.819	355	.830	117	.835	39	.842	78
Brakemen, locomotive	362	.914	357	.915	357	.915	315	.915	42
Car riders	108	.835	108	.835	108	.835	108	.835	-------
Conveyor men	123	.871	119	.871	119	.871	119	.871	-------
Dispatchers	11	.950	9	.962	9	.962	9	.962	-------
Engineers, locomotive	384	1.091	343	1.145	343	1.145	301	1.145	42
Firemen, locomotive	277	.867	235	.915	235	.915	193	.915	42
Hoistmen, outside	479	.872	362	.858	48	.904	24	.904	24
Motormen, inside	704	.858	524	.852	132	.845	66	.845	66
Trammers, ore, inside	177	.843	156	.841	32	(2)	-------	-------	32
Truck drivers	1,279	.857	991	.953	991	.953	871	.953	120
Truck drivers, service	174	.796	143	.833	131	.844	107	.844	24
Custodial									
Change-house men	270	.750	200	.790	60	.799	42	.807	18
Guards	308	.918	256	.937	162	.971	144	.995	18
Watchmen	265	.696	180	.762	122	.760	109	.758	13

[1] Lake Superior region includes Michigan, Minnesota, and Wisconsin; Southeast region includes Alabama and Georgia; Northeast region includes New Jersey, New York, and Pennsylvania; West region includes California, Missouri, Utah, Washington and Wyoming.
[2] Too few workers and/or companies to warrant computation of an average.

Nearly four-fifths of the workers in Minnesota are employed in the Mesabi Range, which is the most important area in the iron-mining industry, from the standpoint of both volume of employment and output of iron ore. Most of the ore produced in the Mesabi Range is extracted by the open-pit method. Underground mines predominate in the Vermillion Range and open-cut mines in the Cuyuna Range. In most of the occupations for which figures are shown, there was no substantial difference between the hourly earnings of workers in the Mesabi Range and those in the Cuyuna and Vermillion Ranges.

Iron ore produced in Michigan and Wisconsin comes from three ranges—the Marquette in Michigan, and the Gogebic and Menominee, both of which lie partly in Wisconsin and partly in Michigan. Most of the mines in these three ranges are underground. The average hourly earnings shown for Michigan and Wisconsin represent 8,558 workers, nine-tenths of whom were employed in Michigan mines. The highest average hourly rate ($1.187) for workers studied in Michigan and Wisconsin was paid to power-shovel operators, and the lowest

Occupations in Iron-Ore Mines, by Region,[1] October 1943—Continued

Lake Superior district—Continued			Southeast		Northeast		West		Occupation
Minnesota—Contd.	Michigan and Wisconsin								
Other ranges—Contd.									
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	
									Recording and control
-------	4	(2)	24	$0.816	4	$0.843	2	$0.938	Timekeepers.
									Material movement
$0.832	238	$0.828	102	.778	7	.864	-------	-------	Brakemen, inside.
(2)	-------	-------	-------	-------	5	(2)	-------	-------	Brakemen, locomotive.
-------	-------	-------	-------	-------	-------	-------	-------	-------	Car riders.
-------	-------	-------	-------	-------	2	(2)	2	(2)	Conveyor men.
-------	-------	-------	-------	-------	-------	-------	2	(2)	Dispatchers.
(2)	-------	-------	32	(2)	9	(2)	-------	-------	Engineers, locomotive.
(2)	-------	-------	34	.547	8	(2)	-------	-------	Firemen, locomotive.
.905	314	.851	44	1.002	69	.861	4	(2)	Hoistmen, outside.
.845	392	.854	104	.948	69	.770	7	(2)	Motormen, inside.
(2)	124	.845	-------	-------	21	.862	-------	-------	Trammers, ore, inside.
(2)	-------	-------	246	.448	-------	-------	42	.992	Truck drivers.
(2)	12	.705	22	(2)	1	(2)	8	.919	Truck drivers, service.
									Custodial
.780	140	.786	41	.626	27	.639	2	(2)	Change-house men.
(2)	94	.878	4	.793	44	.822	4	(2)	Guards.
.780	58	.766	66	.499	15	.851	4	(2)	Watchmen.

(70.5 cents) to drivers of small service trucks. Contract miners, who accounted for 46 percent of all workers covered, earned an average of $1.074 an hour. Two-fifths of the workers were concentrated in occupations for which average hourly earnings ranged from 80 to 90 cents. Ten occupations, comprising less than 10 percent of the workers, had average earnings of less than 80 cents an hour.

In general, workers in Minnesota mines received slightly higher average hourly earnings than those employed in the Michigan and Wisconsin mines. The hourly rates paid in Minnesota exceeded those of the other two States in 23 of the 30 occupations for which averages are shown for both of these regions. In 9 of the 23 occupations, the margin in favor of workers in Minnesota mines was less than 5 cents an hour and in only 6 occupations did it exceed 10 cents an hour. For all 30 occupations combined, workers earned an average of 98.2 cents an hour in Minnesota and 94.3 cents an hour in Michigan and Wisconsin combined. These averages were arrived at by weighting the averages for the respective occupations in each region by the total

number of workers in each occupation in both areas. This makes it possible to overcome any possible distortion resulting from differences in occupational structure between the two areas.

Southeastern region.—The earnings data shown for workers in this district represent iron-ore mines in Alabama and Georgia. Although this region includes a large number of small open-pit operations, the majority of the workers are employed in the large underground mines of the Birmingham area. Contract miners, who constituted about one-fifth of the workers for whom occupational earnings data are shown, earned an average of $1.021 an hour. Aside from contract miners, rates of $1.00 or more an hour were paid only to outside hoistmen and to electricians. Slightly more than one-tenth of the workers were classified in occupations averaging from 90 cents to $1.00 an hour, nearly one-fourth were in those averaging from 80 to 90 cents, and one-sixth of the workers were in jobs for which the average earnings ranged from 70 to 80 cents an hour. Occupations with average earnings below 70 cents an hour accounted for more than one-fourth of the workers in the region. Virtually all occupations in open-pit operations were found in this group.

Northeastern region.—Of the 9 iron-ore mines studied in this region, only one was an open-pit operation. The earnings data shown for processing occupations are therefore limited to those for workers in the underground mines. Contract miners, loading-machine operators, and working foremen, together representing nearly one-third of the workers studied, earned $1.00 or more per hour. The highest average ($1.101) was paid to contract miners, who formed the largest occupational group in the region. Nearly half of the workers were concentrated in occupations having average hourly earnings within the 10-cent range from 80 to 90 cents an hour. Averages below 80 cents an hour were paid to workers in only 11 occupations, which together accounted for less than a fifth of the workers. Change-house men earned an average of 63.9 cents an hour, the lowest figure shown for any occupation in the region.

Western region.—The occupational information presented for the Western States is based on data for 402 workers in 7 widely scattered mines. Average hourly earnings could be shown only for a very limited number of occupations, because of the wide variation in size and type of operation. In the occupations for which it was feasible to show earnings data, the average hourly rates ranged from 82.6 cents for samplers to $1.25 for shovel operators. Nine of the 16 occupations for which figures are shown had average hourly earnings of $1.00 or more.

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