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METAL-MINE ACCIDENTS

IN THE
UNITED STATES

DURING THE CALENDAR YEAR 1935

BY
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METAL-MINE ACCIDENTS IN THE UNITED STATES DURING THE CALENDAR YEAR 1935¹

By W. W. ADAMS² and M. E. KOLHOS³

INTRODUCTION

The metal and nonmetallic mineral mines (excluding coal mines) of the United States had a more favorable safety record in 1935 than in any year except 1931 and 1932 since annual statistics of accidents first became available in 1911. The accident rate was even lower than that for 1911, when the recorded rate probably did not reflect all of the accidents that actually occurred because many companies had not yet begun to keep complete records of accidents, especially those causing only minor injuries, and when, therefore, the number of accidents revealed by the companies' reports to the Bureau of Mines was probably not as complete as that reported for later years. Compared with 1911, the accident rate covering fatal and nonfatal injuries in 1935 decreased 13 percent. Compared with 1925, when the rate was the highest ever reported, the rate for 1935 decreased 47 percent and compared with 1934, 7 percent.

The progress in safety which the mines of the country made in 1935 was not confined to any section or mining region; it was shared by a majority of the mining States and applied to underground mining operations, to open-pit mining, and to work at surface shops and yards. The rate for underground mining declined 8 percent from 1934; the rate for open-pit mining declined 14 percent, and that for surface shops and yards 12 percent.

Reports received by the Bureau of Mines from companies and individuals engaged in mining metallic ores and nonmetallic minerals other than coal showed that 92,314 men were employed during the calendar year 1935. This number represents the summation of reports covering individual mines; each report shows the daily average number of men employed for the number of days on which the mine was active during the year. The number of employees increased over that for 1934 not only because of an actual increase in the working force during 1935 but also because the Bureau's canvass of the mining industry covered many small properties in 1935 that had not been covered by the canvasses of previous years. The more complete coverage for 1935 was made possible by special facilities available for the work of that year; therefore the extent to which the number of workers during 1935 actually increased over the number for 1934 cannot be stated. However, reports for both years, covering identical

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companies, revealed a notable and general increase in the number of employees in 1935.

The volume of work done at the mines during the year totaled 20,352,372 man-days of labor; that is, the men were exposed to mining hazards for more than 20,000,000 man-days or man-shifts. The number of man-days worked represented an average of 220 days per man and indicated a total working time of 161,302,671 man-hours, an average of 7.93 hours per man per day or 1,747 hours per man during the average period of 220 days on which the mines were active.

The average number of working hours per employee during 1935 increased for underground mining and for open-pit mining but decreased for surface shops and yards.

Accidents in and about the mines (not including those in mills and smelters which are covered in a separate publication of the Bureau of Mines) resulted in 164 deaths and 10,206 injuries; each injury disabled an employee for more than the remainder of the day on which the accident occurred. The ratio of fatalities to injuries was 1 to 62. In 1934 the ratio was 1 to 68. The frequency of fatalities per million man-hours of exposure was 1.02, or almost the same as that for 1934, which was 1.00; the nonfatal-injury rate was 63.27, a decrease of 7 percent.

Of the men employed at metal mines during 1935, 59 percent were engaged in mining operations underground; 80 percent of the total number of fatalities and injuries occurred underground, and the rate for accidents in shafts as well as underground levels was 83.99 per million man-hours of employment underground. Open-pit mines employed 13 percent of the total number of men but had only 5 percent of the accidents; their accident rate was 26.65 per million man-hours worked. Surface shops and yards accounted for 28 percent of all employees and 15 percent of all accidents; the accident-frequency rate for the group was 36.90 per million man-hours of labor performed above ground. The rate for surface work includes that for placer operations other than placers operated by underground or hydraulicking methods. Underground placers are grouped with other underground mines, and placer properties operated by hydraulicking methods are included with open-pit mines.

The chief cause of fatal accidents during 1935 was falls of rock or ore from the roof or wall, which accounted for almost half of the total number of deaths underground during the year. The second most important cause was explosives, which accounted for about half as many fatalities as falls of rock or ore. The outstanding causes of nonfatal injuries were falls of rock or ore from the roof or wall, haulage, handling materials other than rock or ore at the face, handling or loading rock or ore, drilling, hand tools, and falling down chutes, winzes, raises, or stopes.

Of the 10,370 lost-time accidents that occurred during 1935, including 164 that resulted in the death of the injured employee, 7 accidents caused permanent total disability to the injured workers, 246 resulted in permanent partial disability, and the remainder (9,953) resulted in temporary disability. Although the reports from the operating companies to the Bureau of Mines do not show the number of days of disability resulting from accidents, it is possible to estimate the total number by applying certain average figures to the number of accidents of each class shown on the operators' reports. The average

loss of time chargeable to fatalities and permanent total disabilities is generally taken as 6,000 days, which represents the average expectancy for industrial usefulness of persons killed or permanently and totally disabled by industrial accidents. The 164 fatalities and 7 permanent total disabilities reported in 1935 therefore represent a disability period of 1,026,000 days. The time to be charged for permanent partial disabilities has been standardized, for statistical purposes, according to the nature and severity of injury, and averages for injuries falling under this class have been computed from records submitted to the Bureau of Mines by metal-mining companies that have participated in the National Safety Competition which the Bureau has conducted for a number of years. The records used for computing an average for injuries of this type were those covering the safety contest for the 3 years 1933-35, and the resulting average was 658 days of disability per permanent partial injury. The same reports were used to compute the average number of days of disability for temporary injuries, and they revealed an average of 34 days per injury.

If these averages are applied to the accidents reported by all mining companies to the Bureau of Mines during the past 3 years, the accident-severity rates for the metal- and nonmetal-mining industry per thousand man-hours of exposure may be approximated as follows:

	<i>Days lost per 1,000 man-hours of exposure</i>
1933.....	9.35
1934.....	9.43
1935.....	9.46

These figures show an increase in the accident-severity rate since 1933 and, when considered in connection with a 7-percent reduction in the accident-frequency rate in 1935 compared with 1934, indicate that the progress made during 1935 consisted of a reduction in number of the less-severe injuries. This fact is further indicated when the figures for 1934 and 1935 are broken down to show the severity rate for each of the four classes of accidents shown on the reports of mine operators to the Bureau of Mines. The severity rates per thousand man-hours of exposure, when computed according to the method previously described, were as follows:

	Days lost per 1,000 man-hours of exposure		Percent change in 1935
	1934	1935	
Fatalities.....	5.99	6.10	+2
Permanent total disabilities.....	.10	.26	+160
Permanent partial disabilities.....	1.08	1.00	-7
Temporary disabilities.....	2.25	2.10	-7

The figures show that an increase in the severity rates for the more serious injuries accompanied the declines in rates for the less serious injuries.

Among 20 of the more important mining States, California employed the largest number of men, with almost double the number of employees of its nearest competitor, Arizona, as shown in table 1. How-

ever, California ranked seventeenth in fatality rate and nineteenth in nonfatal-injury rate. New York, which stood last among the 20 States in the number of men working, ranked eighth according to relative frequency of fatal accidents and tenth according to relative frequency of nonfatal injuries. The standing of each of the 20 States is shown in table 1.

TABLE 1.—*Relative standing of States having 1,000 or more men employed at mines in 1935, classified according to number of men employed and fatality and injury rates per million man-hours of labor performed*

Relative standing	State	Number of men employed	Relative standing	State	Fatality rate ¹	Relative standing	State	Injury rate ¹
1	California.....	14,291	1	Texas.....	0.25	1	Minnesota.....	9.97
2	Arizona.....	7,612	2	Tennessee.....	.34	2	Michigan.....	19.93
3	Montana.....	7,567	3	Montana.....	.44	3	Tennessee.....	25.69
4	Michigan.....	6,204	4	Michigan.....	.45	4	Alabama.....	25.72
5	Colorado.....	6,146	5	Oregon.....	.52	5	South Dakota.....	31.15
6	Idaho.....	5,316	6	Kansas.....	.53	6	Missouri.....	33.81
7	Minnesota.....	5,135	7	South Dakota.....	.57	7	Oregon.....	44.65
8	Nevada.....	4,394	8	New York.....	.57	8	Alaska.....	52.95
9	Utah.....	4,098	9	Minnesota.....	.81	9	Texas.....	56.35
10	Alaska.....	3,603	10	Oklahoma.....	1.03	10	New York.....	57.39
11	Alabama.....	3,223	11	Arizona.....	1.07	11	Arizona.....	60.14
12	Oklahoma.....	2,756	12	Missouri.....	1.13	12	Colorado.....	65.53
13	South Dakota.....	2,159	13	New Mexico.....	1.15	13	Utah.....	66.40
14	New Mexico.....	2,134	14	Alaska.....	1.16	14	Nevada.....	66.56
15	Missouri.....	2,055	15	Utah.....	1.20	15	New Mexico.....	77.55
16	Texas.....	1,940	16	Nevada.....	1.26	16	Oklahoma.....	78.59
17	Oregon.....	1,537	17	California.....	1.31	17	Kansas.....	78.75
18	Tennessee.....	1,442	18	Idaho.....	1.39	18	Montana.....	86.00
19	Kansas.....	1,370	19	Alabama.....	1.46	19	California.....	106.87
20	New York.....	1,118	20	Colorado.....	2.42	20	Idaho.....	109.98
	United States total.....	92,314		United States average.....	1.02		United States average.....	63.28

¹ Number of deaths or injuries per million man-hours of exposure.

ACKNOWLEDGMENTS

The figures presented in this bulletin are based upon reports furnished voluntarily by mining companies to the Bureau of Mines. The Bureau acknowledges and deeply appreciates the cooperation it has received from the operators.

RELATION OF STATISTICS TO CALENDAR YEAR

This and all other regular statistical reports published by the Bureau of Mines relate to calendar years. The data contained in this bulletin are intended to show the number of deaths and injuries resulting from accidents that occurred during the calendar year 1935. For accident-prevention studies, it is believed that accidents should be charged to the year in which they occurred so that they may be examined in connection with the causes and conditions that produced them.

SCOPE OF STATISTICS

The tables in this paper are based on reports from 10,819 mines that were operated all or part of the year 1935. Data for mines in Alaska were furnished by the Territorial mine inspector; figures for all other States were received directly from the operating companies, except

those for Arizona and Idaho which were received from the companies through the offices of the State mine officials of those States. Reports for all States cover mines employing any men, whether the mines were productive or nonproductive; many prospects also are included, although many others are omitted, as it is obviously impossible to obtain complete reports for all prospects by mail.

CLASSIFICATION OF INJURIES

Statistics of accidents and employment at metal mines and all other mines except coal mines have been compiled by the Bureau of Mines since 1911. From 1911 to 1914, inclusive, the Bureau's classification of nonfatal injuries covered two groups: "Serious" injuries disabling a workman for more than 20 days and "slight" injuries causing disability not exceeding 20 days but longer than the remainder of the day of accident. Beginning with 1915 and continuing through 1929 a "serious" injury, as the term was used in the Bureau's reports, signified a temporary injury disabling an employee more than 14 days. Beginning with 1930 all temporary injuries have been included in a single group, which comprises all temporary injuries causing disability for more than the remainder of the day on which the accident occurred.

CLASSIFICATION OF MINES

Tables on the following pages are arranged to represent five divisions of the mining industry, as follows:

Copper mines.—This group comprises all mines reported in operation in which copper was the principal mineral produced.

Gold, silver, and miscellaneous metal mines.—This group comprises gold mines (both lode and placer), silver mines, lead-silver mines, gold-silver mines, lead and zinc mines other than those in the Mississippi Valley, and mines working ores of quicksilver, manganese, manganiferous iron, tungsten, vanadium, chromium, etc. Pyrite mines are included, as the cinder is used in some metallurgical works for its iron and copper content, and bauxite mines because bauxite is the main source of metallic aluminum.

Iron mines.—All iron mines are included in this group except those whose ores are valuable chiefly for their manganese content.

Lead and zinc mines (Mississippi Valley).—This group comprises the lead and zinc mines of the Mississippi Valley only, but it also includes fluor spar mines in Illinois and Kentucky.

Nonmetallic-mineral mines.—The nonmetallic-mineral mines include those that produce asbestos, asphaltum, barite, borax, emery, feldspar, flint, fluor spar (except in Illinois and Kentucky), garnet, graphite, gypsum, lithia, magnesite, mica, mineral paint, phosphate rock, quartz, salt, soapstone, sulphur, talc, and tripoli. Coal mines are not included, and the records do not cover properties that produce stone, clay, or sand and gravel.

TABLE 2.—All mines: Number of active mines, men employed, man-days, man-hours of employment, and number killed and injured, by kind of mine, during the year ended Dec. 31, 1935

Kind of mine	Number of operators	Number of mines	Men employed				Man-days of employment				Average hours of employment per man per day				Man-hours of employment			
			Underground	Surface	Open-cut	Total	Underground	Surface	Open-cut	Total	Underground	Surface	Open-cut	Total	Underground	Surface	Open-cut	Total
Copper.....	66	94	6,203	2,355	1,630	10,188	1,700,447	622,248	464,388	2,787,083	8.00	8.00	8.00	8.00	13,603,172	4,974,981	3,715,102	22,293,255
Iron.....	101	174	7,691	3,137	3,213	14,041	1,676,333	716,297	684,138	3,076,768	8.00	8.01	8.10	8.02	13,404,152	5,735,430	5,643,062	24,682,644
Lead and zinc (Mississippi Valley).....	149	190	5,924	626	178	6,728	1,032,684	123,013	36,704	1,192,401	7.99	8.09	9.41	8.04	8,251,745	994,738	345,262	9,591,745
Gold, silver, and miscellaneous.....	9,075	9,866	32,089	17,543	3,386	53,018	7,415,192	3,256,295	538,302	11,209,789	7.88	7.95	7.93	7.90	58,418,137	25,877,194	4,271,389	88,566,720
Gold, silver: Lode.....	5,160	5,417	23,183	6,952	970	37,105	6,768,648	1,735,439	188,777	8,662,864	7.88	7.91	8.07	7.89	53,311,886	13,730,742	1,281,011	68,323,639
Gold: Placer.....	3,707	4,224	1,066	10,250	1,698	13,014	194,401	1,440,414	288,507	1,923,322	7.91	7.99	7.80	7.96	1,538,455	111,513,958	2,251,217	15,302,730
Miscellaneous.....	208	225	1,840	341	718	2,899	452,143	80,442	91,018	623,603	7.89	7.87	8.12	7.92	3,567,796	633,394	739,161	4,940,351
Nonmetal.....	427	495	2,498	2,360	3,481	8,339	574,048	748,950	763,333	2,086,331	7.90	7.06	8.31	7.75	4,534,890	5,287,707	6,345,710	16,168,307
Total, 1935.....	10,819	11,819	54,405	26,021	11,888	92,314	12,398,704	5,466,803	2,486,865	20,352,372	7.92	7.84	8.13	7.93	98,212,096	42,870,950	20,220,525	161,302,671
Total, 1934.....	3,598	3,938	38,225	18,175	10,245	66,645	8,387,701	4,451,934	1,883,580	14,723,215	7.95	7.72	8.01	7.89	96,707,134	34,355,450	15,083,816	116,146,400

Kind of mine	Average days active			Average hours per man per year			Number killed			Number injured			Orphans	Rates per million man-hours												
	Average days active			Average hours per man per year			Number killed			Number injured				Killed			Injured									
	Underground	Surface	Total	Underground	Surface	Total	Underground	Surface	Total	Underground	Surface	Total		Widows	Underground	Surface	Total	Underground	Surface	Total						
																					Open-cut	Total	Open-cut	Total	Open-cut	Total
Copper.....	274	264	285	274	2,193	2,113	2,279	2,188	14	4	1	19	1,276	131	59	1,466	11	11	1,03	0.80	0.27	0.35	93.80	26.33	15.88	65.76
Iron.....	218	228	213	219	1,743	1,828	1,725	1,758	18	18	4	22	344	24	72	440	11	10	1.34	---	.72	.89	25.06	4.19	12.99	17.83
Lead and zinc (Mississippi Valley).....	174	197	206	177	1,393	1,589	1,940	1,426	8	1	---	9	607	53	---	660	6	22	.97	1.01	---	.94	73.56	63.28	---	68.81
Gold, silver, and miscellaneous.....	231	186	159	211	1,821	1,475	1,261	1,671	88	15	4	107	5,587	1,088	152	6,827	43	95	1.51	.58	.90	1.21	95.64	42.04	35.59	77.08
Gold, silver: Lode.....	232	250	164	233	1,827	1,975	1,321	1,841	75	14	2	91	5,088	660	43	5,741	42	93	1.41	1.02	1.56	1.33	94.50	48.07	33.57	84.03
Gold: Placer.....	182	141	170	148	1,443	1,123	1,326	1,176	8	1	2	11	154	392	91	637	0	1	5.20	.09	.83	.72	100.10	34.05	40.42	41.63
Miscellaneous.....	246	236	127	215	1,639	1,857	1,029	1,704	5	---	---	5	395	36	18	449	1	1	1.40	---	---	1.01	110.71	56.84	24.35	90.88
Nonmetal.....	230	317	219	250	1,815	2,241	1,823	1,939	4	2	1	7	303	264	246	813	7	18	.88	.38	.16	.43	66.82	49.93	38.77	50.28
Total, 1935.....	228	210	209	220	1,805	1,648	1,701	1,747	132	22	10	164	8,117	1,560	529	10,206	78	156	1.34	.51	.49	1.02	82.55	36.39	26.16	63.27
Total, 1934.....	219	245	184	221	1,745	1,890	1,472	1,743	93	8	15	116	6,003	1,437	452	7,892	62	111	1.39	.23	.99	1.00	86.99	41.83	29.97	67.95

ACCIDENT STATISTICS, BY STATES AND CAUSES

Tables 3 to 10, inclusive, show the number of men employed in the metal and nonmetallic mineral mines of the United States during the calendar year 1935, the number of men injured or killed by accidents while at work, and the number and percentage of accidents due to the principal hazards to which miners are exposed.

TABLE 3.—All mines: Number of active mines, men employed, man-days of employment, and man-hours of employment, by States, during the year ended Dec. 31, 1935

State	Num-ber of opera-tors	Num-ber of mines	Men employed				Man-days of employment				Man-hours of employment			
			Under-ground	Surface	Open-cut	Total	Under-ground	Surface	Open-cut	Total	Under-ground	Surface	Open-cut	Total
Alabama.....	39	46	2,135	537	551	3,223	468,892	125,509	85,155	769,556	3,740,564	1,008,274	732,596	5,481,434
Alaska.....	530	931	8,824	2,194	575	3,603	235,570	522,413	103,500	861,663	4,179,304	828,000	6,839,304	
Arizona.....	919	21	4,384	2,427	801	7,612	377,478	184,256	33,800	1,527,070	7,674,727	1,482,525	12,155,438	
Arkansas.....	21	21	4,271	459	341	5,085	45,369	5,885	33,800	85,054	354,200	47,078	270,307	
California.....	3,382	3,382	7,819	5,385	1,087	14,291	1,750,871	997,220	207,703	2,955,794	13,943,559	7,948,739	23,590,078	
Colorado.....	786	852	4,342	1,555	249	6,146	1,019,790	328,815	45,839	1,394,444	8,144,186	2,636,775	11,147,627	
Connecticut.....	10	10	32	15	4	681	9,771	2,747	175,036	12,854	22,714	2,687	11,109,943	
Florida.....	17	21	681	101	681	1,363	40,434	12,668	175,036	175,036	1,526,565	1,526,565	1,526,565	
Georgia.....	50	50	251	101	107	459	688,844	294,902	22,821	1,006,567	2,359,740	183,029	7,987,893	
Illinois.....	803	902	3,030	2,072	205	5,316	688,844	294,902	22,821	1,006,567	2,359,740	183,029	7,987,893	
Iowa.....	19	24	143	42	245	5,245	33,550	13,110	12,947	59,607	106,410	125,072	504,982	
Kansas.....	42	45	1,207	121	88	1,370	10,935	13,213	1,536	12,684	83,590	1,810	97,688	
Kentucky.....	31	41	265	112	42	1,370	207,864	21,944	7,373	237,181	1,657,644	175,512	1,892,140	
Louisiana.....	94	6	162	577	186	653	77,538	24,394	26,986	128,927	1,625,264	198,921	1,040,155	
Maine.....	23	23	162	577	186	653	34,638	210,605	245,245	245,245	258,178	1,684,840	1,943,018	
Michigan.....	34	23	985	2,092	83	84	889,804	462,625	11,946	1,392,636	7,120,736	3,700,853	11,139,063	
Minnesota.....	30	69	803	987	2,365	5,135	431,819	239,675	552,029	1,222,923	3,470,562	4,436,957	9,825,324	
Missouri.....	30	102	5,508	97	450	7,567	223,005	12,506	97,468	1,832,913	1,784,040	103,800	2,061,561	
Montana.....	1,192	1,192	5,508	1,982	99	7,567	1,391,872	388,637	13,004	1,793,513	10,627,571	3,029,608	13,755,763	
Nevada.....	867	900	3,104	667	623	4,394	723,603	147,466	130,605	1,001,674	5,716,781	1,045,940	7,368,979	
New Hampshire.....	7	10	355	77	47	84	8,480	18,622	12,158	1,025,420	3,700,853	53,472	1,227,862	
New Jersey.....	6	6	119	369	22	684	128,051	106,182	1,946	1,552,832	1,917,805	15,566	4,245,639	
New Mexico.....	136	143	575	369	22	2,134	461,468	106,182	1,946	3,557,091	1,917,805	15,566	4,245,639	
New York.....	23	27	869	181	68	1,118	171,457	38,553	15,787	225,797	1,326,944	129,434	1,742,854	
North Carolina.....	66	71	262	113	408	723	30,866	17,441	79,855	135,856	139,523	633,706	1,011,517	
Ohio.....	5	5	63	2	29	94	7,460	316	7,300	15,075	50,680	68,000	130,200	
Oklahoma.....	60	60	2,511	161	84	2,756	440,964	28,807	16,806	486,577	3,510,680	282,528	3,880,715	
Oregon.....	406	503	605	618	314	1,537	113,888	87,901	46,677	248,166	696,369	336,372	1,925,589	
Pennsylvania.....	7	7	81	42	118	211	11,922	7,980	23,183	42,185	88,176	185,463	337,479	
South Carolina.....	18	18	26	27	80	147	5,460	3,990	5,284	14,684	31,520	43,269	128,469	
South Dakota.....	35	35	1,178	896	82	2,159	360,679	282,420	15,038	658,137	2,885,452	120,621	5,265,413	
Tennessee.....	25	48	673	147	622	1,442	169,290	40,623	137,016	1,391,606	327,218	1,200,351	2,919,175	
Texas.....	28	34	405	1,430	105	1,940	116,939	437,932	23,746	576,777	2,863,530	1,183,496	3,939,049	
Utah.....	269	298	2,966	423	709	4,098	802,042	108,730	239,634	1,150,404	6,409,346	861,094	9,185,862	
Vermont.....	9	6	20	3	66	66	4,870	696	6,357	11,923	38,962	54,568	54,568	
Virginia.....	33	34	356	48	279	683	75,423	10,475	41,854	130,752	628,958	84,658	350,252	

TABLE 3.—All mines: Number of active mines, men employed, man-days of employment, and man-hours of employment, by States, during the year ended Dec. 31, 1935—Continued

State	Num-ber of oper-a-tors	Num-ber of mines	Men employed				Man-days of employment				Man-hours of employment			
			Under-ground	Surface	Open-cut	Total	Under-ground	Surface	Open-cut	Total	Under-ground	Surface	Open-cut	Total
Washington	239	255	373	281	133	787	64,987	29,638	30,430	125,055	519,752	236,474	243,148	999,374
Wisconsin	7	8	572	181	3	756	129,544	43,701	137	173,382	1,036,348	349,014	1,100	1,387,662
Wyoming	37	44	191	122	22	335	35,749	14,524	3,422	53,695	1,284,090	115,245	27,376	426,711
Other States ¹	11	11	---	---	23	23	---	---	4,102	4,102	---	---	34,675	34,675
Total, 1935	---	10,810	54,405	26,021	11,888	92,314	12,398,704	5,466,803	2,486,865	20,352,372	98,212,096	42,870,050	20,220,525	161,302,671
Total, 1934	---	3,398	38,225	18,175	10,245	66,645	8,387,701	4,451,934	1,883,580	14,723,215	66,707,134	34,353,450	15,083,816	116,146,400

¹ Includes Indiana, Maryland, Massachusetts, Nebraska, and West Virginia.

TABLE 4.—All mines: Average length of workday (hours), average days active, average hours per man per year, by States, during the year ended Dec. 31, 1935

State	Average length of workday (hours)				Average days active				Average hours per man per year			
	Underground	Surface	Open-cut	Total	Underground	Surface	Open-cut	Total	Underground	Surface	Open-cut	Total
Alabama.....	7.98	8.03	8.60	8.07	220	234	155	211	1,752	1,878	1,330	1,701
Alaska.....	8.00	8.00	8.00	8.00	283	288	180	239	2,261	1,905	1,440	1,913
Arizona.....	7.95	7.94	8.05	7.96	220	156	230	201	1,751	1,235	1,851	1,597
Arkansas.....	7.81	8.00	8.01	7.90	167	100	99	127	1,307	798	794	1,002
California.....	7.99	7.97	7.93	7.98	224	185	191	207	1,790	1,476	1,516	1,651
Colorado.....	7.99	8.02	8.00	7.99	235	212	184	227	1,876	1,696	1,473	1,814
Connecticut.....	8.65	8.27	8.00	8.55	188	183	84	181	1,626	1,514	1,672	1,548
Florida.....	---	---	8.72	8.72	---	---	257	257	---	---	2,242	2,242
Georgia.....	8.08	8.10	8.18	8.11	161	125	180	158	1,302	1,016	1,472	1,278
Idaho.....	7.89	8.00	8.02	7.89	227	142	111	189	1,775	1,139	1,893	1,483
Illinois.....	8.15	8.12	9.66	8.47	235	252	259	243	1,913	2,046	2,501	2,061
Iowa.....	7.64	8.50	8.00	7.70	146	213	128	144	1,115	1,810	1,024	1,110
Kansas.....	7.97	8.00	8.00	7.98	172	181	176	173	1,373	1,451	1,404	1,381
Kentucky.....	8.06	8.15	8.00	8.07	218	218	145	197	1,761	1,776	1,161	1,593
Louisiana.....	7.45	8.00	---	7.92	214	365	---	332	1,594	2,920	---	2,629
Maine.....	8.00	---	8.51	8.50	186	---	144	144	1,488	---	1,225	1,228
Michigan.....	8.00	8.00	7.90	8.00	223	231	185	225	1,787	1,849	1,463	1,795
Minnesota.....	8.04	8.02	8.04	8.03	240	247	233	238	1,925	1,983	1,876	1,913
Missouri.....	8.00	8.30	7.94	7.99	148	129	217	162	1,183	1,070	1,719	1,295
Montana.....	7.64	7.80	7.58	7.67	251	201	131	237	1,920	1,568	996	1,818
Nevada.....	7.90	7.93	8.01	7.92	233	221	210	228	1,842	1,754	1,679	1,805
New Hampshire.....	8.01	---	8.31	8.19	249	---	259	255	1,997	---	2,151	2,086
New Jersey.....	8.01	8.00	8.68	8.03	219	242	280	223	1,753	1,935	2,431	1,795
New Mexico.....	7.71	7.28	8.00	7.63	269	270	89	267	2,069	1,967	708	2,036
New York.....	7.74	7.43	8.20	7.72	197	213	232	202	1,527	1,583	1,903	1,559
North Carolina.....	8.34	8.00	8.02	8.11	195	154	194	188	1,625	1,235	1,533	1,524
Ohio.....	8.00	8.00	9.32	8.64	118	158	252	160	947	1,264	2,345	1,385
Oklahoma.....	7.97	8.06	7.91	7.98	176	179	200	177	1,400	1,442	1,583	1,408
Oregon.....	7.86	7.92	7.21	7.76	188	142	149	161	1,476	1,127	1,071	1,253
Pennsylvania.....	8.00	8.00	8.00	8.00	216	190	196	200	1,729	1,520	1,572	1,599
South Carolina.....	8.00	7.90	9.22	8.41	210	148	194	184	1,680	1,167	1,788	1,543
South Dakota.....	8.00	8.00	8.02	8.00	306	314	183	305	2,449	2,513	1,471	2,439
Tennessee.....	8.22	8.05	8.76	8.42	252	276	220	241	2,068	2,226	1,930	2,024
Texas.....	7.69	6.54	8.07	6.83	287	306	227	297	2,204	2,002	1,748	2,031
Utah.....	7.99	7.92	7.99	7.99	270	257	338	281	2,161	2,036	2,702	2,242
Vermont.....	8.00	8.00	8.57	8.30	244	232	148	181	1,948	1,856	1,266	1,500
Virginia.....	8.02	8.08	8.37	8.14	220	218	150	191	1,767	1,764	1,255	1,558
Washington.....	8.00	7.98	7.99	7.99	174	105	229	159	1,393	842	1,828	1,270
Wisconsin.....	8.00	8.00	8.03	8.00	226	241	46	229	1,812	1,932	367	1,835
Wyoming.....	7.95	7.93	8.00	7.95	187	119	156	160	1,487	945	1,244	1,274
Other States ¹	---	---	8.45	8.45	---	---	178	178	---	---	1,508	1,508
Total, 1935.....	7.92	7.84	8.13	7.93	228	210	209	220	1,805	1,648	1,701	1,747
Total, 1934.....	7.95	7.72	8.01	7.89	219	245	184	221	1,745	1,890	1,472	1,743

¹ Includes Indiana, Maryland, Massachusetts, Nebraska, and West Virginia.

12 METAL-MINE ACCIDENTS IN THE UNITED STATES: 1935

TABLE 5.—All mines: Fatalities and injuries and rates per million man-hours, by States, during the year ended Dec. 31, 1935

State	Number killed				Number injured (time lost, 1 day or more)				Widows	Orphans	Rates per million man-hours							
											Killed				Injured			
	Underground	Surface	Open-cut	Total	Underground	Surface	Open-cut	Total			Underground	Surface	Open-cut	Total	Underground	Surface	Open-cut	Total
Alabama	6	1	2	8	95	2	44	141	5	2	1.60	2.73	1.46	25.40	1.98	60.06	25.72	
Alaska	7	1	1	8	210	144	11	365	1	1	3.71	.25	1.16	111.35	35.93	11.01	52.95	
Arizona	11	2	1	13	619	81	31	731	10	7	1.43	.67	1.07	80.65	27.02	20.91	60.14	
Arkansas	1	1	1	3	25	4	9	38	1	1	1.00	1.00	1.00	70.56	84.97	33.23	56.53	
California	28	1	2	31	1,956	458	106	2,520	15	31	2.00	1.13	1.21	131.78	57.62	64.33	106.82	
Colorado	17	9	1	27	619	129	16	764	8	9	2.09	3.41	2.73	2.42	76.01	48.92	43.64	
Connecticut	1	1	1	3	5	1	1	7	1	1	1.00	1.00	1.00	59.14	59.14	59.14	59.14	
Florida	1	1	1	3	41	41	41	41	6	6	1.00	1.00	1.00	26.86	26.86	26.86	26.86	
Georgia	1	1	1	3	1	1	1	3	1	1	1.00	1.00	1.00	31.75	31.75	31.75	31.75	
Idaho	10	1	1	11	786	84	3	873	6	6	1.85	.42	1.39	145.69	35.60	16.39	109.98	
Illinois	1	1	1	3	19	5	2	26	1	1	3.06	1.00	1.98	69.47	46.99	15.99	51.49	
Iowa	1	1	1	3	6	6	6	6	1	1	1.00	1.00	1.00	71.78	71.78	71.78	71.78	
Kansas	1	1	1	3	149	24	7	179	1	1	1.00	1.00	1.00	89.89	89.89	89.89	89.89	
Kentucky	1	1	1	3	91	24	7	122	1	1	1.00	1.00	1.00	145.54	120.65	32.41	117.29	
Louisiana	1	1	1	3	20	99	119	119	1	2	1.00	.59	.51	77.47	58.76	61.24	61.24	
Maine	1	1	1	3	1	1	1	3	1	1	1.00	1.00	1.00	18.90	18.90	18.90	18.90	
Michigan	5	1	1	7	187	29	6	222	2	2	.70	1.00	.45	26.26	7.84	18.90	19.93	
Minnesota	6	1	2	9	54	7	37	98	3	4	1.73	1.00	.45	15.56	3.65	8.34	9.97	
Missouri	3	1	3	7	86	4	1	90	3	18	1.68	1.00	1.13	48.21	38.54	33.81	33.81	
Montana	5	1	1	7	1,065	117	1	1,183	1	3	.47	.33	.44	100.21	38.62	10.14	86.00	
Nevada	9	1	1	10	435	57	36	528	2	7	1.57	1.00	1.26	76.09	48.72	34.42	66.56	
New Hampshire	1	1	1	3	2	2	2	2	1	1	1.00	1.00	1.00	19.79	19.79	19.79	19.79	
New Jersey	1	1	1	3	33	2	1	36	1	1	1.00	1.00	1.00	32.18	13.43	18.70	29.32	
New Mexico	5	1	1	7	301	34	2	337	3	11	1.41	1.00	1.15	84.62	43.99	128.49	77.55	
New York	1	1	1	3	96	4	1	100	1	1	.75	1.00	.57	72.35	13.96	57.39	57.39	
North Carolina	1	1	1	3	11	6	36	53	1	4	3.05	1.00	.91	33.51	43.00	56.80	48.12	
Ohio	1	1	1	3	1	1	1	3	1	1	1.00	1.00	1.00	18.90	18.90	18.90	18.90	
Oklahoma	3	1	1	5	278	21	6	305	2	3	.85	4.31	1.03	79.07	90.49	45.13	78.59	
Oregon	1	1	1	3	43	35	8	86	1	1	1.12	1.00	.52	48.14	50.26	23.78	44.65	
Pennsylvania	2	1	1	4	5	6	6	11	1	2	22.68	1.00	5.93	56.70	32.35	32.59	32.59	
South Carolina	1	1	1	3	1	1	1	3	1	1	1.00	1.00	1.00	18.90	18.90	18.90	18.90	
South Dakota	2	1	1	4	126	38	1	164	2	5	.69	.44	.57	43.67	16.82	31.15	31.15	
Tennessee	1	1	1	3	36	2	37	75	1	3	3.06	1.00	.34	25.87	6.11	30.82	25.69	
Texas	1	1	1	3	81	135	6	222	1	2	.35	1.00	.25	90.74	47.14	32.70	56.35	
Utah	8	2	1	11	566	33	11	610	9	33	1.25	2.32	1.20	88.31	38.32	5.74	66.40	
Vermont	1	1	1	3	3	1	20	24	1	1	1.00	1.00	1.00	77.00	179.60	367.27	242.46	
Virginia	1	1	1	3	28	2	19	49	1	1	1.00	1.00	1.00	44.52	23.62	54.25	46.04	
Washington	1	1	1	3	39	1	18	58	1	1	1.00	1.00	1.00	75.04	4.23	74.03	58.04	
Wisconsin	1	1	1	3	28	1	1	29	1	1	1.00	1.00	1.00	27.02	2.86	20.91	20.91	
Wyoming	1	1	1	3	15	1	1	17	1	1	1.00	1.00	1.00	52.80	8.68	36.53	39.84	
Other States ¹	1	1	1	3	1	1	1	3	1	1	1.00	1.00	1.00	28.84	28.84	28.84	28.84	
Total, 1935	132	22	10	164	8,117	1,560	529	10,206	78	156	1.34	.51	.49	1.02	82.65	36.39	26.16	63.27
Total, 1934	93	8	15	116	6,003	1,437	452	7,892	62	111	1.39	.23	.99	1.00	89.99	41.83	29.97	67.95

¹ Includes Indiana, Maryland, Massachusetts, Nebraska, and West Virginia.

TABLE 6.—All mines: Fatalities, by causes and States, during the year ended Dec. 31, 1935

State	Underground													Shaft											
	Fall of rock or ore from roof or wall	Rock or ore while loading at working face	Hand tools	Explosives	Haulage	Falling down chute, winze, raise, or slope	Run of ore from chute or pocket	Drilling	Electricity	Machinery	Mine fires	Suffocation from natural gases	Inrush of water	Stepping on nail	Handling materials (other than rock or ore)	Other causes	Total, underground	Falling down shaft	Objects falling down shaft	Breaking of cables	Overwinding	Skip, cage, or bucket	Other causes	Total, shaft	
Alabama	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		17	18	19	20	21	22		
Alaska				1	2	2	1		1	2								5							2
Arizona	6				1	1												7							1
California	8			11	1	1												21							3
Colorado	6	1		2	2	2									1			14							4
Idaho	2			2	2	2			2									9							1
Illinois	2		1															9							1
Kansas	1																	1							
Louisiana																		1							
Michigan	2					1			2									5							
Minnesota	6																	6							
Missouri	2				2			1										3							
Montana	3			1														4							
Nevada	2			3														6							1
New Mexico	2	1				1										2		5							3
New York						1												2							
North Carolina						1			1									4							
Oklahoma	2			1														1							
Oregon																		1							
Pennsylvania	2			1														2							
South Dakota	1																	1							1
Tennessee																		1							
Texas																		1							
Utah				1	1	1	1		1									8							
Washington	3																	8							
Total, 1935	48	3	1	23	9	12	3	1	7	2					1	2	110	9	2	1	1	12	1	22	22
Total, 1934	40	3	1	11	5	9	3	2								1	76	9	2			4			17

TABLE 7.—All mines: Injuries, by causes and States, during the year ended Dec. 31, 1935

State	Underground										Shaft														
	Fall of rock or ore from roof or wall	Rock or ore while loading at work	Hand tools	Explosives	Haulage	Falling down chute, winze, raise, or stop	Run of ore from chute or pocket	Drilling	Electricity	Machinery	Mine fires	Suffocation from natural gases	Inrush of water	Stepping on nail	Handling materials (other than rock or ore)	Other causes	Total, underground	Falling down shaft	Objects falling down shaft	Breaking of cables	Overwinding	Skip, cage, or bucket	Other causes	Total, shaft	
Alabama	9	10	8	2	24	1	2	10	7	7	1	4	1	14	7	14	95	17	18	19	20	21	22	112	
Alaska	7	18	19	4	10	1	59	25	7	7	4	4	4	4	4	7	210							210	
Arizona	128	47	59	5	72	32	28	73	12	12	2	2	11	11	42	90	601	3	3	4	6	6	9	18	
Arkansas	8	8	2	1	4			2									24								24
California	373	192	172	83	204	245	64	231	5	48	1	1	40	40	186	93	1,897	2	2	4	1	40	1	59	
Colorado	115	31	69	7	49	44	40	98	2	24	3	3	10	10	44	67	807	3	3	1	4	4	1	12	
Connecticut	1		3													1	5								5
Florida																1	5								5
Georgia	1															1	775	1	4						4
Idaho	187	76	82	4	51	48	11	51	17	17	12	12	12	115	121	191	16	4							16
Illinois	5	1	1		1	1	1	6							1	3	10								10
Iowa	1		1												1	1	6								6
Kansas	9	44	3	1	30	6	1	15	2	2			1	1	2	95	142	3	3						142
Kentucky	24	20	20	14	14			2	1	1	1			11	2	17	80	3	3						80
Louisiana	1		2		1			3	1	1					4	5	20								20
Maine																4	5	20							20
Michigan	36	14	11	1	14	8	12	13	2	6					20	36	182	1	1						182
Minnesota	17	17	2	1	4		1	3	3	3					10	12	54								54
Missouri	12	16	3	1	24		2	7	1	3					12	84	12								84
Montana	282	89	15	7	152	45	28	14	3	1		1	18	259	140	1,054	1	1	1						1,054
Nebraska	77	33	24	5	39	23	15	54	4	6	5	1	21	36	83	426									426
New Hampshire																4	33								33
New Jersey	8	4		3	4	4	2	30		11					17	30	295								295
New Mexico	44	41	48	2	30	16	12	30	11	5			5	6	8	92									92
New York	6	20	2	1	6	8	5	11	4	5			1	1	6	8	92								92
North Carolina			1						1							4	11								11
Ohio																4	11								11
Oklahoma	31	73	9	3	39	16	1	23	4	4			10	14	46	269									269
Oregon	10	3	1	1	8	3	2	4	1	1			1	1	5	3	43								43
Pennsylvania	1						1	1		1					2	5	5								5

TABLE 7.—All mines: Injuries, by causes and States, during the year ended Dec. 31, 1935—Continued

State	Surface										Open-cut										Grand total					
	Mine cars, mine locomotives, or aerial trams	Railway cars and locomotives	Run or fall of ore bins in or from ore	Falls of persons	Stepping on nail	Hand tools	Electricity	Machinery	Handling materials	Other causes	Total, surface	Falls of slides of rock or ore	Explosives	Haulage	Power shovels	Falls of persons	Falls of derricks, booms, etc.	Run or fall of ore bins in or from ore	Machinery	Electricity		Hand tools	Handling materials	Other causes	Total, open-cut	
South Dakota				8	2	2	1	6			38	1	2	2	7	3						10	9	5	37	164
Tennessee		1		9	7	18		25	1		135	1	1	1	2	3						3	3	3	75	
Texas	2	1	1	9	1	5	1	3			33	1	1	1	2	3						5	2	6	222	
Utah	2	3		9	1	5		3			33	3	1	1	2	3						5	3	2	610	
Vermont												3	1			1						1	3	4	20	
Virginia		2		1							2	17				1						1	12	5	24	
Washington											1											1	5	3	19	
Wisconsin											1											1	1	1	49	
Wyoming											1											1	1	1	58	
Other States ¹											1	1	1	1	1	1	1	1	1	1	1	1	1	1	17	
Total, 1935	66	22	17	247	42	153	16	205	358	434	1,560	51	8	45	25	76	4	1	45	3	69	117	85	529	10,206	
Total, 1934	51	22	18	244	46	165	13	204	295	379	1,437	37	5	26	13	57	5		20	1	66	119	103	452	7,892	

¹ Includes Indiana, Maryland, Massachusetts, Nebraska, and West Virginia.

TABLE 8.—All mines: Accidents, by States and severity of injury, during the year ended Dec. 31, 1935

State	Killed	Nonfatal			Total nonfatal	Grand total
		Perma- nent total ¹	Perma- nent partial ²	Tempo- rary ³		
Alabama	8	2	21	118	141	149
Alaska	8		4	361	365	373
Arizona	13		26	705	731	744
Arkansas			2	36	38	38
California	31		45	2,475	2,520	2,551
Colorado	27	1	19	744	764	791
Connecticut				5	5	5
Florida			1	40	41	41
Georgia				6	6	6
Idaho	11	1	14	858	873	884
Illinois	1			26	26	27
Iowa				6	6	6
Kansas	1		7	142	149	150
Kentucky				122	122	122
Louisiana	1	1	2	116	119	120
Maine						
Michigan	5		9	213	222	227
Minnesota	8		7	91	98	106
Missouri	3		4	86	90	93
Montana	6		4	1,179	1,183	1,189
Nevada	10		7	521	528	538
New Hampshire				2	2	2
New Jersey			6	30	36	36
New Mexico	5		9	328	337	342
New York	1	1	6	93	100	101
North Carolina	1			53	53	54
Ohio						
Oklahoma	4	1	12	292	305	309
Oregon	1		1	85	86	87
Pennsylvania	2			11	11	13
South Carolina						
South Dakota	3		7	157	164	167
Tennessee	1		7	68	75	76
Texas	1		10	212	222	223
Utah	11		10	600	610	621
Vermont				24	24	24
Virginia			3	46	49	49
Washington	1			58	58	59
Wisconsin			1	28	29	29
Wyoming			2	15	17	17
Other States ⁴					1	1
Total, 1935	164	7	246	9,953	10,206	10,370
Total, 1934	116	2	191	7,699	6,892	8,008

¹ Permanent total disability: Loss of both legs or arms, 1 leg and 1 arm, total loss of eyesight, paralysis or other condition permanently incapacitating workmen from doing any work of a gainful occupation.

² Permanent partial disability: Loss of 1 foot, leg, arm, hand, eye, 1 or more fingers, 1 or more toes, any dislocation where ligaments are severed, or any other injury known in surgery to be permanent partial disability.

³ Disability for more than the remainder of day of accident.

⁴ Includes Indiana, Maryland, Massachusetts, Nebraska, and West Virginia.

20 METAL-MINE ACCIDENTS IN THE UNITED STATES: 1935

TABLE 9.—All mines: Accidents, by causes and severity of injury, during the year ended Dec. 31, 1935

Cause of accident	Killed	Nonfatal				Grand total
		Perma- nent total ¹	Perma- nent partial ²	Tempo- rary ³	Total non- fatal	
Underground:						
1. Fall of rock or ore from roof or wall..	48	1	37	1,534	1,572	1,620
2. Rock or ore while loading at working face.....	2		16	787	803	805
3. Hand tools.....	1		15	620	635	636
4. Explosives.....	23	1	16	82	99	122
5. Haulage.....	9		24	873	897	906
6. Falling down chute, winze, raise, or stope.....	12		8	527	535	547
7. Run of ore from chute or pocket.....	2		6	317	323	325
8. Drilling.....	1	2	18	748	768	769
9. Electricity.....	7			34	34	41
10. Machinery.....	2		20	161	181	183
11. Mine fires.....				12	12	12
12. Suffocation from natural gases.....				19	19	19
13. Inrush of water.....				4	4	4
14. Stepping on nail.....				170	170	170
15. Handling materials (other than rock or ore).....	1		15	855	870	871
16. Other causes.....	2		11	1,016	1,027	1,029
Total, underground.....	110	4	186	7,759	7,949	8,059
Shaft:						
17. Falling down shaft.....	9	1	1	19	21	30
18. Objects falling down shaft.....			5	24	29	29
19. Breaking of cables.....				7	7	7
20. Overwinding.....				1	1	1
21. Skip, cage, or bucket.....	12		4	76	80	92
22. Other causes.....	1		1	29	30	31
Total, shaft.....	22	1	11	156	168	190
Surface:						
1. Mine cars, mine locomotives, grav- ity or aerial trams.....	3		3	63	66	69
2. Railway cars and locomotives.....	2		2	20	22	24
3. Run or fall of ore in or from ore bins.....				17	17	17
4. Falls of persons.....	2		2	245	247	249
5. Stepping on nail.....			1	41	42	42
6. Hand tools.....			3	150	153	153
7. Electricity.....	2		2	14	16	18
8. Machinery.....	2		8	197	205	207
9. Handling materials.....	2	1	11	346	358	360
10. Other causes.....	9		3	431	434	443
Total, surface.....	22	1	35	1,524	1,560	1,582
Open-cut:						
1. Falls or slides of rock or ore.....	4			51	51	55
2. Explosives.....	1		1	7	8	9
3. Haulage.....	2		2	43	45	47
4. Power shovels.....				25	25	25
5. Falls of persons.....				76	76	76
6. Falls of derricks, booms, etc.....				4	4	4
7. Run or fall of ore in or from ore bins.....				1	1	1
8. Machinery.....	1	1	6	38	45	46
9. Electricity.....	1		1	2	3	4
10. Hand tools.....				69	69	69
11. Handling materials.....			4	113	117	117
12. Other causes.....	1			85	85	86
Total, open-cut.....	10	1	14	514	529	539
Grand total.....	164	7	246	9,953	10,206	10,370

¹ Permanent total disability: Loss of both legs or arms, 1 leg and 1 arm, total loss of eyesight, paralysis, or other condition permanently incapacitating workman from doing any work of a gainful occupation.

² Permanent partial disability: Loss of 1 foot, leg, hand, eye, 1 or more fingers, 1 or more toes, any dislocation where ligaments are severed, or any other injury known in surgery to be permanent partial disability.

³ Disability for more than the remainder of day of accident.

TABLE 10.—All mines: Causes of fatalities and injuries, showing percentage due to each cause and corresponding rates per million man-hours during the year ended Dec. 31, 1935

Cause of accident	Number killed				Number injured			
	Percent of—		Per million man-hours		Percent of—		Per million man-hours	
	Grand total	Class total	Grand total	Class total	Grand total	Class total	Grand total	Class total
Underground:								
1. Fall of rock or ore from roof or wall.....	29.27	43.63	0.30	0.49	15.40	19.78	9.75	16.01
2. Rock or ore while loading at working face.....	1.22	1.82	.01	.02	7.87	10.10	4.98	8.18
3. Hand tools.....	.61	.91	.01	.01	6.22	7.99	3.94	6.46
4. Explosives.....	14.02	20.91	.14	.24	.97	1.25	.61	1.01
5. Haulage.....	5.49	8.18	.06	.09	8.78	11.28	5.56	9.13
6. Falling down chute, winze, raise, or stope.....	7.32	10.91	.07	.12	5.24	6.73	3.32	5.45
7. Run of ore from chute or pocket.....	1.22	1.82	.01	.02	3.17	4.06	2.00	3.29
8. Drilling.....	.61	.91	.01	.01	7.52	9.66	4.76	7.82
9. Electricity.....	4.27	6.36	.04	.07	.33	.43	.21	.35
10. Machinery.....	1.22	1.82	.01	.02	1.77	2.28	1.12	1.84
11. Mine fires.....					.12	.15	.08	.12
12. Suffocation from natural gases.....					.19	.24	.12	.19
13. Inrush of water.....					.04	.05	.02	.04
14. Stepping on nail.....					1.67	12.14	1.05	1.73
15. Handling materials (other than rock or ore).....	.61	.91	.01	.01	8.53	10.94	5.39	8.86
16. Other causes.....	1.22	1.82	.01	.02	10.06	12.92	6.37	10.46
Total, underground.....	67.08	100.00	.68	1.12	77.89	100.00	49.28	80.94
Shaft:								
17. Falling down shaft.....	5.49	40.91	.05	.09	.21	12.50	.13	.21
18. Objects falling down shaft.....					.28	17.26	.18	.30
19. Breaking of cables.....					.07	4.17	.04	.07
20. Overwinding.....					.01	.59	.01	.01
21. Skip, cage, or bucket.....	7.31	54.55	.07	.12	.78	47.62	.49	.81
22. Other causes.....	.61	4.54	.01	.01	.29	17.86	.19	.31
Total, shaft.....	13.41	100.00	.13	.22	1.64	100.00	1.04	1.71
Surface:								
1. Mine cars, mine locomotives, gravity or aerial trams.....	1.82	13.64	.02	.06	.65	4.23	.41	1.54
2. Railway cars and locomotives.....	1.22	9.09	.01	.05	.21	1.41	.14	.52
3. Run or fall of ore in or from ore bins.....					.17	1.09	.10	.40
4. Falls of persons.....	1.22	9.09	.01	.05	2.42	15.83	1.53	5.76
5. Stepping on nail.....					.41	2.69	1.26	.98
6. Hand tools.....					1.50	9.81	.95	3.57
7. Electricity.....	1.22	9.09	.01	.05	.16	1.03	.10	.37
8. Machinery.....	1.22	9.09	.01	.05	2.01	13.14	1.27	4.78
9. Handling materials.....	1.22	9.09	.01	.05	3.51	22.95	2.22	8.35
10. Other causes.....	5.49	40.91	.06	.20	4.25	27.82	2.69	10.12
Total, surface.....	13.41	100.00	.13	.51	15.29	100.00	9.67	36.39
Open-cut:								
1. Falls or slides of rock or ore.....	2.44	40.00	.02	.19	.50	9.64	.32	2.52
2. Explosives.....	.61	10.00	.01	.05	.08	1.51	.05	.39
3. Haulage.....	1.22	20.00	.01	.10	.44	8.51	.28	2.23
4. Power shovels.....					.24	4.73	.15	1.23
5. Falls of persons.....					.74	14.37	.47	3.76
6. Falls of derricks, booms, etc.....					.04	.75	.02	.20
7. Run or fall of ore in or from ore bins.....					.01	.18	.01	.05
8. Machinery.....	.61	10.00	.01	.05	.44	8.51	.28	2.23
9. Electricity.....	.61	10.00	.01	.05	.03	.57	.02	.15
10. Hand tools.....					.68	13.04	.43	3.41
11. Handling materials.....					1.15	22.12	.73	5.79
12. Other causes.....	.61	10.00	.01	.05	.83	16.07	.52	4.20
Total, open-cut.....	6.10	100.00	.07	.49	5.18	100.00	3.28	26.16
Grand total, 1935.....	100.00		1.02		100.00		63.27	
Grand total, 1934.....	100.00		1.00		100.00		67.95	

CLASSIFICATION OF ACCIDENTS, BY KIND OF MINE

Copper mines.—The fatality rate for mines whose chief output was copper-bearing ore was lower and therefore better than that for any other major class of metal mines. The number of men killed was 19, which represented a fatality rate of 0.85 per million man-hours of work performed during the year. Although the rate was favorable compared with the rates for other classes of metal mining, it was not as low as the rate for mining nonmetallic minerals, which was 0.43 as shown in table 2. The nonfatal-injury rate for copper mines was 65.8, and while this rate compared favorably with the rates for the lead-zinc and gold-silver groups it was more than three times as high as the rate for iron-ore mines and was materially higher than the rate for nonmetallic-mineral mines. Accidents during the year resulted in 19 deaths and 1,466 nonfatal lost-time injuries among 10,188 employees. The mines were in operation for an average of 274 days or 2,188 hours per man. The largest number of employees was reported for mines in Montana, although an almost equally large number was reported for mines in Arizona. Nevada and Utah were among the more important copper-mining States, but they employed only about a fifth or a sixth as many men as Arizona and Montana. A comparison of the records for underground operations at copper mines in the two principal States showed an accident-frequency rate of 65.4 for Arizona and 127.1 for Montana for each million man-hours worked underground. Tables 2, 11, 12, and 21 show the number of employees, days worked, and the number and causes of accidents at copper mines during the calendar year 1935.

TABLE 11.—Copper mines: Men employed and man-days of employment, by States, during the year ended Dec. 31, 1935

State	Number of operators	Number of mines	Men employed				Man-days of employment				Average hours of employment per man per day				Average days active		
			Under-ground		Surface		Under-ground		Surface		Under-ground		Surface		Under-ground	Open-cut	Total
			Under-ground	Surface	Open-cut	Total	Under-ground	Surface	Open-cut	Total	Under-ground	Surface	Open-cut	Total	Under-ground	Open-cut	Total
Arizona	27	29	1,846	736	754	3,336	443,342	189,350	177,275	809,967	8.00	8.00	8.00	240	257	235	243
Montana	3	28	2,949	735	3,684	894,919	200,860	1,095,779	8.00	7.99	8.00	8.00	303	273	---	237	
Nevada	4	4	150	121	284	43,870	35,300	72,913	151,083	8.00	8.00	8.00	286	292	---	272	
Utah	3	3	19	586	605	4,768	213,740	218,598	8.00	8.00	8.00	8.00	251	565	---	361	
Other States ¹	29	30	1,239	763	6	2,008	196,738	460	511,746	8.00	8.00	8.00	234	258	77	255	
Total, 1935	-----	94	6,203	2,355	1,630	10,188	1,700,447	622,248	464,288	2,787,083	8.00	8.00	8.00	274	264	285	274
Total, 1934	-----	88	4,605	1,942	1,537	8,084	1,016,300	493,607	330,801	1,840,798	8.00	8.00	8.00	221	254	215	228

¹ Includes Alaska, Colorado, Idaho, Michigan, New Mexico, North Carolina, Oregon, South Carolina, Tennessee, and Washington.

TABLE 12.—Copper mines: Number of man-hours of employment and number killed and injured, by States, during the year ended Dec. 31, 1935

State	Man-hours of employment			Average hours per man per year				Number killed				Number injured				Wid-ows Or-phans	
	Under-ground		Total	Under-ground		Surface		Under-ground		Surface		Under-ground		Surface		Under-ground	Open-cut
	Under-ground	Surface	Open-cut	Under-ground	Surface	Open-cut	Total	Under-ground	Surface	Open-cut	Total	Under-ground	Surface	Open-cut	Total	Under-ground	Open-cut
Arizona	3,546,736	1,514,800	1,418,198	1,921	2,058	1,881	1,942	8	2	---	10	224	28	280	9	6	
Montana	7,158,952	1,603,880	8,762,832	2,438	2,182	2,370	2,370	4	1	---	5	906	59	965	(¹)	(¹)	
Nevada	7,342,960	282,400	583,304	2,286	2,334	2,054	2,178	1	---	---	1	44	19	23	86	---	
Utah	38,144	1,709,920	1,748,064	2,008	2,063	2,918	2,889	---	---	---	1	1	---	8	9	---	
Other States ¹	2,516,380	1,573,901	3,680	2,031	2,063	613	2,039	1	1	---	2	101	25	126	1	3	
Total, 1935	13,603,172	4,974,981	3,715,102	2,193	2,113	2,270	2,188	14	4	1	19	1,276	131	59	1,466	---	
Total, 1934	8,131,118	3,940,020	2,646,479	1,766	2,033	1,722	1,822	9	---	---	3	12	60	53	669	---	

¹ Includes Alaska, Colorado, Idaho, Michigan, New Mexico, North Carolina, Oregon, South Carolina, Tennessee, and Washington.
² Not available.

Gold, silver, and miscellaneous metal mines.—This group of mines, as defined on page 5, had higher rates than the other classes of metal mines, both for fatal and nonfatal accidents. The fatality rate was 1.21 and the injury rate was 77.1 per million man-hours worked. Underground mining had the highest rate (97.2); it was twice the rate for surface work (42.6) and almost three times the rate for open-pit work (36.5). The rate for lode mining of the ores of gold, silver, copper, lead, and zinc was 85.4; miscellaneous metals, such as manganese, quicksilver, etc., had a combined rate of 91.9. These rates were derived from the figures in table 2, which also shows the number of men employed and the number of man-days and man-hours the mines were in operation. The chief causes of accidents at mines in the gold-silver group, as shown in table 21, were falls of rock or ore from the roof or wall, drilling, haulage, handling materials, and hand tools. The principal mining States in this group and their accident-frequency rates per million man-hours of exposure underground were California, 142.8; Colorado, 77.6; Utah, 89.9; Idaho, 148.4; Nevada, 74.2; and Arizona, 96.7. This comparison is based upon the accident rates for underground work only, to avoid the lack of comparability that would result if the records for surface work and open-pit mining were included. (See tables 2, 13, 14, and 21.)

TABLE 13.—Gold, silver, and miscellaneous metal mines: Men employed and man-days of employment by States, during the year ended Dec. 31, 1935

State	Num-ber of oper-ators	Num-ber of mines	Men employed				Man-days of employment				Average hours of employment per man per day				Average days active			
			Under-ground	Sur-face	Open-cut	Total	Under-ground	Sur-face	Open-cut	Total	Under-ground	Sur-face	Open-cut	Total	Under-ground	Sur-face	Open-cut	Total
Alabama.....	12	12	99	16	36	151	25,278	4,305	3,111	32,694	8.71	8.98	8.00	8.68	255	269	86	217
Alaska.....	538	538	794	2,178	575	3,545	226,670	518,318	103,500	848,488	8.00	8.00	8.00	8.00	285	238	180	239
Arizona.....	886	896	2,513	1,686	41	4,242	516,434	187,943	6,000	710,377	7.91	7.88	9.41	7.91	206	111	146	167
Arkansas.....	16	18	296	59	339	664	44,677	5,885	33,720	84,282	7.78	8.00	8.01	7.89	168	100	99	127
California.....	3,286	3,337	7,515	5,301	894	13,710	1,667,075	975,049	164,660	2,806,784	7.99	7.97	7.91	7.98	222	184	184	205
Colorado.....	3,768	832	4,289	1,545	189	6,023	1,011,471	327,225	33,817	1,372,513	7.99	8.02	8.00	7.99	236	212	179	228
Georgia.....	34	35	197	98	13	303	30,011	10,614	365	40,990	8.07	8.03	8.90	8.07	152	114	28	135
Idaho.....	886	895	2,990	2,054	205	5,249	678,329	290,456	22,821	991,606	7.83	8.02	8.02	7.88	227	141	111	189
Minnesota.....	5	5	12	12	86	110	2,160	2,280	16,949	21,379	8.00	8.00	8.00	8.00	180	190	197	194
Montana.....	1,093	1,114	2,529	1,193	91	3,813	481,568	186,657	10,854	679,079	6.95	7.59	7.50	7.13	190	156	119	178
Nevada.....	848	881	2,920	540	282	3,742	671,037	110,293	49,733	831,063	7.89	7.91	8.03	7.90	230	204	176	222
New Mexico.....	127	134	1,545	240	13	1,798	405,517	51,128	1,104	457,749	7.83	7.82	8.00	7.83	262	213	85	255
North Carolina.....	31	31	99	83	42	224	15,875	9,732	5,610	31,217	8.63	8.00	8.24	8.36	160	117	134	139
Oregon.....	492	499	589	612	307	1,508	109,668	85,711	46,065	241,444	7.86	7.92	7.20	7.75	186	140	150	160
South Carolina.....	14	14	22	23	20	65	4,510	3,040	4,396	11,946	8.00	7.87	9.45	8.50	205	132	220	184
South Dakota.....	30	30	1,175	899	44	2,118	360,199	282,420	6,718	649,337	8.00	8.00	8.05	8.00	307	314	153	307
Tennessee.....	3	3	113	10	14	137	23,037	2,600	2,520	28,157	8.00	8.00	8.00	8.00	204	204	180	206
Texas.....	9	9	315	65	380	97,782	19,252	95,914	5,410	117,709	8.00	7.95	8.00	7.99	310	296	150	308
Utah.....	252	275	865	371	36	3,272	777,385	192,522	9,114	878,089	8.09	8.28	8.35	8.15	271	259	123	269
Virginia.....	18	19	243	39	87	369	54,716	8,509	73,885	10,660	8.00	7.98	7.93	8.00	225	218	123	200
Washington.....	224	238	316	277	37	630	53,799	28,824	4,247	86,870	8.00	7.90	7.93	7.99	170	104	115	138
Wyoming.....	33	40	79	95	7	181	13,166	9,132	638	22,936	8.00	7.90	8.00	7.96	167	96	91	127
Other States 1.....	11	11	604	152	28	784	144,828	41,008	5,404	191,240	7.75	7.47	8.00	7.70	240	270	193	244
Total, 1935.....	9,866	9,866	32,089	17,543	3,386	53,018	7,415,192	3,256,295	538,302	11,209,789	7.88	7.95	7.94	7.90	231	186	159	211
Total, 1934.....	2,908	2,908	19,209	8,650	1,922	29,781	4,543,165	2,068,438	325,388	6,936,991	7.95	7.56	7.70	7.82	237	219	169	233

1 Includes Michigan, Missouri, New Jersey, New York, and Vermont.

2 Not available.

TABLE 14.—Gold, silver, and miscellaneous metal mines: Number of man-hours of employment and number killed and injured, by States, during the year ended Dec. 31, 1935

State	Man-hours of employment			Average hours per man per year			Number killed			Number injured			Wid-ows	Or-phans
	Under-ground	Surface	Total	Under-ground	Sur-face	Total	Under-ground	Sur-face	Total	Under-ground	Sur-face	Total		
Alabama.....	220, 224	38, 640	258, 762	2, 224	2, 415	1, 879	7	1	8	11	139	11		
Alaska.....	1, 813, 360	4, 146, 544	6, 767, 904	2, 284	1, 906	1, 440	3	1	4	199	52	349		
Arizona.....	4, 084, 069	1, 481, 906	5, 622, 449	1, 625	1, 377	1, 325	3		3	392	11	445	1	
Arkansas.....	347, 375	47, 078	664, 620	1, 306	798	1, 001				25	4	38		
California.....	13, 322, 599	7, 771, 247	22, 396, 226	1, 773	1, 466	1, 634	26	1	29	1, 876	443	2, 418	13	25
Colorado.....	8, 077, 634	2, 624, 055	10, 972, 181	1, 883	1, 698	1, 431	17	9	27	610	129	750	8	9
Georgia.....	242, 068	85, 267	330, 585	1, 229	917	1, 091				775	80	861	6	
Idaho.....	5, 311, 001	2, 324, 170	7, 818, 200	1, 776	1, 132	893	10	1	11					
Minnesota.....	17, 280	18, 240	135, 590	1, 440	1, 520	1, 577				154	57	212	1	3
Montana.....	3, 344, 539	1, 416, 768	4, 842, 691	1, 322	1, 188	894	1		1	385	38	429	2	7
Nevada.....	5, 296, 253	872, 658	399, 121	1, 814	1, 616	1, 415	8		9	296	31	329	3	11
New Mexico.....	3, 177, 030	399, 796	3, 585, 658	2, 056	1, 666	1, 679	5		5					
North Carolina.....	137, 000	77, 856	46, 200	1, 384	1, 091	1, 100	1		1	29	32	60		
Oregon.....	861, 788	678, 849	1, 872, 113	1, 463	1, 040	1, 080	1		1					
South Carolina.....	36, 080	23, 920	101, 560	1, 640	1, 078	1, 229	2	1	3	126	38	164	2	5
South Dakota.....	2, 881, 592	2, 259, 360	54, 064	2, 452	2, 513	2, 279								
Tennessee.....	184, 297	20, 800	225, 257	1, 631	2, 080	1, 440	4		3					
Texas.....	746, 559	148, 436	894, 995	2, 370	2, 284	2, 355								
Utah.....	6, 216, 696	762, 792	7, 022, 768	2, 170	2, 056	2, 146	7	2	9	50	6	56		
Virginia.....	442, 524	70, 472	89, 021	1, 821	1, 807	1, 023				552	30	582	7	28
Washington.....	430, 392	229, 962	694, 037	1, 631	850	1, 102				24	2	27		
Wyoming.....	105, 325	72, 109	182, 538	1, 333	759	1, 008				37	1	38		
Other States ¹	1, 122, 452	306, 269	1, 471, 955	1, 858	2, 015	1, 877	1		1	38	5	43		
Total, 1935.....	58, 418, 137	25, 877, 194	88, 566, 720	1, 821	1, 475	1, 671	88	15	107	5, 587	1, 088	6, 827	43	95
Total, 1934.....	36, 135, 517	15, 637, 669	54, 278, 418	1, 881	1, 808	1, 823	66	7	77	4, 274	1, 903	5, 307	32	

¹ Includes Michigan, Missouri, New Jersey, New York, and Vermont.

Iron mines.—The iron-ore mines of the United States employed 9 percent fewer men in 1935 than in 1934 but showed a slight gain (about 2 percent) in the number of man-hours of labor performed. The average worker was employed for 219 days or 1,758 man-hours. The 8-hour day was almost universal, but overtime at some mines and a somewhat longer shift at other mines brought the average workday for all employees to 8.02 hours per man. Accidents killed 22 and injured 440 men, which resulted in a fatality rate of 0.89 and an injury rate of 17.8 per million man-hours of employment. These rates are comparable with 0.66 and 20.1, respectively, for 1934.

The iron-mining industry has had a favorable safety record for a number of years; its accident rate, for fatal and nonfatal injuries was lower in 1935 than the corresponding rate for any of the other major classes of mining. The rate was even lower than that for mines producing nonmetallic minerals, as shown in table 2. Not only was the total accident rate for iron mines more favorable than that for the other classes of mines but the rates for underground work, open-pit mining, and surface work were lower in iron mines than those for similar work in the other classes of mines. The accident rates for underground mining of iron ore in the principal iron-producing States were 25.6 for Alabama, 23.6 for Michigan, and 17.4 for Minnesota. Minnesota was the principal State in which iron ore was also produced by open-pit methods; and it had an accident rate for open-pit mining of 9.1 compared with 13.7 for all States combined. (See tables 2, 15, 16, and 21.)

TABLE 15.—Iron mines: Men employed and man-days of employment, by States, during the year ended Dec. 31, 1935

State	Number of operators	Number of mines	Men employed			Man-days of employment			Average hours of employment per man per day			Average days active				
			Under-ground	Surface	Open-cut	Under-ground	Surface	Open-cut	Under-ground	Surface	Open-cut	Under-ground	Surface	Open-cut	Total	
Alabama.....	25	32	2,036	521	481	443,014	121,204	74,360	639,178	7.94	8.00	8.69	218	233	155	210
Michigan.....	22	47	2,846	1,350	181	602,107	234,074	50,955	927,136	8.01	8.00	7.86	212	218	171	212
Minnesota.....	26	64	1,791	955	2,279	429,659	236,735	555,080	1,201,534	8.04	8.03	8.04	240	243	235	239
New York.....	3	5	1,302	80	382	43,510	10,363	53,573	53,573	8.00	8.00	8.00	144	130	---	151
Utah.....	4	4	3	---	59	180	---	13,610	13,780	8.00	8.00	8.00	60	---	231	222
Wisconsin.....	3	3	375	157	3	93,674	39,163	137	132,974	8.00	8.00	8.03	230	249	46	249
Other States ¹	19	19	338	74	210	63,389	14,698	29,996	108,283	8.00	8.07	8.07	188	199	143	174
Total, 1935.....	---	174	7,691	3,137	3,213	1,676,333	716,297	684,138	3,076,768	8.00	8.01	8.00	218	228	213	219
Total, 1934.....	---	176	7,909	3,780	3,788	1,528,784	802,974	681,594	3,013,352	8.01	7.99	8.00	193	212	180	196

¹ Includes Arkansas, California, Georgia, Missouri, New Jersey, North Carolina, Pennsylvania, Tennessee, Virginia, Washington, and Wyoming.

TABLE 16.—Iron mines: Number of man-hours of employment and number killed and injured, by States, during the year ended Dec. 31, 1935

State	Man-hours of employment			Average hours per man per year			Number killed			Number injured			Wid-ows	Or-phans	
	Under-ground	Surface	Open-cut	Under-ground	Surface	Open-cut	Under-ground	Surface	Open-cut	Under-ground	Surface	Open-cut			Total
Alabama.....	3,520,340	969,634	646,236	1,729	1,861	1,344	1,691	6	---	2	84	2	109	5	2
Michigan.....	4,822,859	2,352,446	243,458	1,695	1,743	1,345	1,921	4	---	---	110	13	5	128	2
Minnesota.....	3,453,282	1,809,565	4,301,367	1,928	1,989	1,887	1,925	6	---	2	54	7	37	98	3
New York.....	348,087	82,902	---	1,153	1,036	---	1,179	---	---	---	61	---	---	61	---
Utah.....	1,440	---	---	480	---	---	1,845	---	---	---	---	---	3	---	---
Wisconsin.....	749,388	313,310	108,880	1,998	1,966	1,367	1,983	---	---	---	1	---	---	---	---
Other States ¹	508,766	117,573	242,021	1,505	1,589	1,152	1,396	2	---	---	23	1	4	13	---
Total, 1935.....	13,404,152	5,735,430	5,543,062	1,743	1,828	1,725	1,758	18	---	4	344	24	72	440	11
Total, 1934.....	12,240,724	6,411,860	5,454,359	1,548	1,696	1,440	1,558	13	---	3	345	51	89	485	12

¹ Includes New Jersey, Pennsylvania, Washington, and Wyoming.

Lead and zinc mines (Mississippi Valley).—Mines producing lead and zinc ores, in the Mississippi Valley States, together with fluor spar mines in Illinois and Kentucky, employed more men and worked more man-hours in 1935 than in 1934; the number of workers increased 33 percent and the man-hours worked 22 percent. The average employee worked 177 days or 1,426 hours during the year, which was less than the average period of employment in 1934. Nine men were killed and 660 men were injured by accidents in and about the mines; the fatality rate was 0.94 and the injury rate 68.8 per million man-hours of work performed. The principal cause of accidents was loading ore at the working face. Haulage accidents ranked second in number of men injured. Oklahoma, Missouri, and Kansas were the chief mining States; records for these States revealed accident rates for underground work per million man-hours of 80.2 for Oklahoma, 50.8 for Missouri, and 90.3 for Kansas. The number and causes of accidents and the number of men employed are shown in tables 2, 17, 18, and 21.

TABLE 17.—Lead and zinc mines ¹ (Mississippi Valley): Men employed and man-days of employment, by States, during the year ended Dec. 31, 1935

State	Number of operators	Number of mines	Men employed			Man-days of employment			Average hours of employment per man per day			Average days active				
			Under-ground	Sur-face	Open-cut	Under-ground	Sur-face	Total	Under-ground	Sur-face	Total	Under-ground	Sur-face	Total		
Illinois.....	11	16	138	52	13	203	13,110	3,315	48,775	8.18	8.12	10.00	8.27	224	252	240
Kansas.....	27	29	946	114	---	1,060	151,908	20,119	172,027	7.05	8.00	8.00	7.05	161	176	162
Kentucky.....	29	39	321	102	37	460	68,803	6,169	74,972	8.07	8.17	8.00	8.00	204	214	216
Missouri.....	31	31	1,487	37	38	1,622	219,109	12,800	232,909	8.00	8.30	8.00	8.00	144	190	146
Oklahoma.....	44	63	2,504	161	---	2,665	439,352	28,807	468,159	7.97	8.06	10.00	7.98	175	170	176
Other States ²	7	8	528	100	90	718	121,152	22,500	170,245	8.00	8.00	10.00	8.23	229	266	237
Total, 1935.....	---	190	5,924	626	178	6,728	1,032,684	123,013	1,192,401	7.99	8.09	9.41	8.04	174	197	206
Total, 1934.....	---	119	4,267	697	105	5,069	818,907	148,286	985,013	7.94	8.04	8.51	7.97	192	213	170

¹ Includes fluorspar mines in Illinois and Kentucky.

² Includes Tennessee and Wisconsin.

TABLE 18.—Lead and zinc mines ¹ (Mississippi Valley): Number of man-hours of employment and number killed and injured, by States, during the year ended Dec. 31, 1935

State	Man-hours of employment			Average hours per man per year			Number killed			Number injured			Wid-Or-phans	
	Under-ground	Sur-face	Open-cut	Under-ground	Sur-face	Total	Under-ground	Open-cut	Total	Under-ground	Open-cut	Total	Under-ground	Total
Illinois.....	263,900	106,410	33,150	1,912	2,046	1,987	1	---	---	19	5	24	1	1
Kansas.....	1,207,504	160,912	49,352	1,276	1,412	1,291	1	1	1	108	23	108	---	---
Kentucky.....	555,386	178,694	37,760	1,730	1,751	1,703	3	3	3	87	4	110	---	---
Missouri.....	1,752,872	103,800	232,080	1,179	1,070	994	3	4	4	86	4	90	3	18
Oklahoma.....	3,503,024	232,024	225,000	1,399	1,441	1,402	3	1	1	278	21	299	2	3
Other States ²	969,059	212,902	225,000	1,835	2,129	1,960	---	---	---	---	---	---	---	---
Total, 1935.....	8,251,745	994,738	345,262	1,393	1,589	1,426	8	1	1	607	53	660	6	22
Total, 1934.....	6,503,667	1,192,094	151,600	1,524	1,710	1,548	2	---	---	537	77	644	3	3

¹ Includes fluorspar mines in Illinois and Kentucky.

² Includes Tennessee and Wisconsin.

Nonmetallic-mineral mines.—An increase in the number of workers and the number of man-hours of work performed during the year was reported by mines engaged in the production of nonmetallic minerals in 1935. Increases were also shown in the average number of work-days and the average number of hours worked per man. This group of mines, which covers all underground and open-pit mines that produced nonmetallic minerals other than stone, clay, sand, gravel, and coal, reported a total of 8,339 men employed in 1935. The average working time per employee was 250 days, or 1,939 hours. Accidents resulted in 7 fatalities and 813 nonfatal injuries, representing a fatality rate of 0.43 and an injury rate of 50.3 per million man-hours worked. Each of these rates was more favorable than that for 1934. The reports for 1935 showed that the principal causes of accidents underground were loading at the working face, hand tools, fall of roof, and haulage. The main causes of accidents in open-pit mining were handling materials, falls of persons, hand tools, and falls or slides of rock or ore. New York, California, and Kansas reported the largest number of employees underground. Although the three principal States produced dissimilar types of minerals, it is interesting to observe that the accident-frequency rates for underground operations were 37.2 per million man-hours for New York, 122.2 for California, and 91.1 for Kansas. Measured by the number of men working underground, the principal nonmetallic minerals represented by these figures were gypsum and salt in New York, magnesite and borax in California, and salt and gypsum in Kansas, although the mining of other minerals also contributed to the accident rates given.

TABLE 19.—Nonmetallic mineral mines: Men employed and man-days of employment, by States, during the year ended Dec. 31, 1935

State	Number of operators	Number of mines	Men employed			Man-days of employment			Average hours of employment per man per day			Average days active					
			Under-ground	Sur-face	Open-cut	Under-ground	Sur-face	Total	Under-ground	Sur-face	Total	Under-ground	Sur-face	Total			
California.....	44	47	304	84	180	568	83,796	22,171	42,353	148,320	8.01	8.01	8.02	276	264	235	261
Colorado.....	16	18	46	10	60	116	7,499	1,590	12,022	21,111	8.00	8.00	8.00	163	159	200	182
Connecticut.....	10	21	52	15	4	71	9,771	2,747	12,854	19,854	8.65	8.27	8.00	188	183	84	181
Florida.....	17	21	42	7	681	681	9,052	1,640	175,059	175,059	8.24	8.16	8.17	277	277	257	257
Georgia.....	14	14	75	7	89	188	10,893	2,213	18,590	29,772	7.64	8.00	8.00	146	146	211	216
Iowa.....	7	7	261	7	12	310	55,936	1,825	1,856	22,684	6.04	8.00	8.00	214	214	128	144
Kansas.....	15	16	162	577	42	739	34,638	210,605	7,373	243,243	7.45	8.00	8.00	214	214	176	210
Louisiana.....	6	6	162	577	42	739	34,638	210,605	7,373	243,243	7.45	8.00	8.00	214	214	176	210
Maine.....	24	25	1	1	83	84	38,186	110	11,946	12,132	8.00	8.00	8.51	186	186	141	144
Michigan.....	7	7	180	1	36	217	38,671	110	9,252	45,033	7.90	8.00	8.00	215	110	257	221
Missouri.....	53	60	3	3	380	383	15,385	1,120	86,747	87,338	8.06	8.00	7.93	197	228	228	228
Montana.....	6	6	58	4	8	70	9,696	1,873	2,150	18,658	8.00	8.00	7.98	285	285	246	267
Nevada.....	16	18	34	6	57	97	8,480	1,873	7,969	19,828	8.00	8.00	8.19	285	312	146	207
New Hampshire.....	7	10	34	6	47	81	8,480	1,873	12,158	20,638	8.01	8.00	8.31	239	239	259	255
New Mexico.....	6	6	165	150	9	324	55,454	54,784	16,787	111,080	6.78	6.77	8.00	536	365	40	343
New York.....	19	20	434	25	68	527	91,771	5,404	16,787	112,962	7.91	7.97	8.20	211	210	235	245
North Carolina.....	33	41	67	7	361	435	14,053	1,747	73,430	89,230	8.24	8.00	8.00	210	250	202	205
Ohio.....	5	5	63	2	29	94	7,460	316	7,300	19,076	8.00	8.00	7.32	118	138	100	100
Oklahoma.....	5	6	67	4	84	91	1,852	16,506	16,506	18,388	8.00	10.00	8.91	226	280	200	202
Tennessee.....	17	18	67	4	496	567	18,760	1,120	109,796	128,776	10.00	10.00	8.94	280	280	271	229
Texas.....	19	25	90	1,365	108	560	18,257	418,740	22,746	459,743	8.00	6.45	7.07	205	307	216	235
Utah.....	10	16	79	52	28	189	19,709	12,816	6,874	39,339	7.77	6.67	7.75	249	307	246	246
Vermont.....	4	4	20	3	40	63	4,870	696	6,267	11,533	8.00	8.00	8.30	244	252	157	188
Virginia.....	13	13	113	9	168	290	23,707	1,966	29,658	55,231	7.86	7.22	8.35	210	210	176	180
Washington.....	4	4	31	3	80	111	8,408	24,025	32,453	32,453	7.98	8.00	8.00	271	271	100	232
Other States.....	51	51	110	31	334	475	25,361	7,167	62,231	94,739	7.98	8.00	8.34	231	231	186	199
Total, 1935.....		495	2,498	2,360	3,481	8,339	574,048	748,950	763,333	2,086,331	7.90	7.06	8.31	230	317	219	250
Total, 1934.....		307	2,235	3,106	2,893	8,234	480,455	938,619	827,987	1,947,061	7.69	7.63	8.19	215	302	183	236

¹ Includes Alabama, Arizona, Arkansas, Idaho, Illinois, Indiana, Kentucky, Maryland, Massachusetts, Nebraska, New Jersey, Oregon, Pennsylvania, South Carolina, South Dakota, West Virginia, and Wyoming.

TABLE 20.—Nonmetallic mineral mines: Number of man-hours of employment and number killed and injured, by States, during the year ended, Dec. 31, 1935

State	Man-hours of employment				Average hours per man per year				Number killed				Number injured				Wid-ows	Or-phans
	Under-ground	Surface	Open-cut	Total	Under-ground	Sur-face	Open-cut	Total	Under-ground	Sur-face	Open-cut	Total	Under-ground	Sur-face	Open-cut	Total		
California.....	670,960	177,492	339,880	1,188,332	2,207	2,113	1,888	2,092	2			2	80	15	7	102	6	
Colorado.....	59,992	12,720	96,174	168,886	1,304	1,272	1,603	1,456					9		5	14		
Connecticut.....	84,542	22,714	2,687	109,943	1,626	1,514	1,672	1,648					5			5		
Florida.....			1,526,565	244,488	1,777	2,346	2,242	2,242							41	41		
Georgia.....	74,628	16,420	153,440	97,688	1,115	1,810	1,724	1,110					6		5	5		
Iowa.....	83,590	1,810	12,288	523,724	1,725	2,086	1,404	1,689					41			6		
Kansas.....	450,140	14,600	58,984	1,943,018	1,594	2,920	1,404	2,629	1			1	20	99		119	2	
Louisiana.....	258,178	1,684,840		1,083,160	1,488	1,225	1,228	1,228					10		1	11		
Maine.....	1,488		101,672	103,160	1,488	1,225	1,228	1,228					10		1	11		
Michigan.....	305,671	880	74,016	380,567	1,698	880	2,056	1,754										
Missouri.....	4,728		687,951	692,679	1,576	1,810	1,809	1,809										
Montana.....	124,080	8,960	17,200	160,240	2,139	2,240	2,150	2,146					5	1		6		
Nevada.....	77,568	14,982	63,515	156,065	2,281	2,497	1,114	1,609					6		7	13		
New Hampshire.....	67,895		101,084	168,979	1,997	2,151	2,086	2,327							2	2		
New Mexico.....	376,085	371,026	6,734	763,845	2,279	2,474	1,904	1,704					5	3		8		
New York.....	725,625	43,072	129,434	898,131	1,672	1,723	1,904	1,704					27			28		
North Carolina.....	115,767	13,976	587,446	717,189	1,728	1,997	1,627	1,649	1			1	11	5	36	52	4	
Ohio.....	59,680	2,528	68,000	130,208	947	1,264	1,385	1,385										
Oklahoma.....	12,656		132,955	145,611	1,808	1,800	1,583	1,600							6	6		
Tennessee.....	187,600	11,200	937,591	1,136,391	2,800	2,800	1,890	2,004					12	1	37	50		
Texas.....	146,064	2,715,094	183,496	3,044,654	1,623	1,989	1,748	1,952					31	129	6	166		
Utah.....	153,066	98,302	63,782	305,150	1,938	1,890	1,921	1,919					13	3	20	24		
Vermont.....	38,962	5,568	53,736	98,266	1,948	1,856	1,343	1,560					3	1	18	22		
Virginia.....	186,434	14,186	246,091	446,711	1,650	1,576	1,465	1,540					4		18	24		
Washington.....	67,120		192,200	259,320	2,165	2,403	2,403	2,336							17	18		
Washington, D. C.....	202,371	57,337	518,788	778,497	1,840	1,850	1,553	1,639					14	6	38	58		
Total, 1935.....	4,634,890	5,287,707	6,345,710	16,168,307	1,815	2,241	1,823	1,939	4	2	1	7	303	264	246	813	18	
Total, 1934.....	3,696,108	7,164,807	4,321,146	15,187,061	1,654	2,307	1,495	1,844	3	1	4	8	291	346	150	787	8	

¹Includes Alabama, Arizona, Arkansas, Idaho, Illinois, Kentucky, Maryland, New Jersey, and Pennsylvania.

TABLE 21.—All mines: Fatalities and injuries, classified by kind of mine and severity of injury, during the year ended Dec. 31, 1935

Kind of mine and severity of injury	Underground											Shaft												
	Fall of rock or ore from roof or wall	Rock or ore while loading at working face	Hand tools	Explosives	Haulage	Falling down chute, winze, raise, or slope	Run of ore from chute	Drilling	Electricity	Machinery	Mine fires	Suffocation from natural gases	Inrush of water	Stepping on nail	Handling material (other than rock or ore)	Other causes	Total, underground	Falling down shaft	Objects falling down shaft	Breaking of cables	Overwinding	Skip, cage, or bucket	Other causes	Total, shaft
Killed:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		17	18	19	20	21	22	
Copper.....	6			1	2	1		1	2	2							9					5		5
Iron.....	10			1	2	1											18							
Lead and zinc (Mississippi Valley).....	4			1	2	1		1	2								8							
Gold, silver, miscellaneous.....	26	2	1	20	4	10	2		3						1	2	71	9			7	1		17
Gold, silver: Lode.....	18	2	1	17	2	10	2		3						1	2	58	9			7	1		17
Gold: Placer.....	5			3	2												8							
Miscellaneous.....	3																5							
Nonmetal.....	2				1				1								4							
Total.....	48	2	1	23	9	12	2	1	7	2					1	2	110	9			12	1		22
Permanent total:																								
Copper.....																								
Iron.....				1				2									3							
Lead and zinc (Mississippi Valley).....	1																1							
Gold, silver, miscellaneous.....																								
Gold, silver: Lode.....																								
Gold: Placer.....																								
Miscellaneous.....																								
Nonmetal.....																								
Total.....	1			1				2									4	1						1

REVIEW BY STATES

Of all fatal and nonfatal injuries that occurred at metal and non-metal mines during 1935, more than 65 percent were nonfatal injuries that were attributed to 10 leading causes of accidents underground. The injury rates for these main causes, therefore, afford a good index of the relative degree of safety of mine workers from similar hazards in the various States. The leading causes of accidents and the accident-frequency rate for each cause are shown in table 22 for each of the principal mining States. The table shows an average rate of 82.65 nonfatal injuries per million man-hours of exposure to underground hazards for the United States as a whole. The rates for individual States ranged from 15.6 for Minnesota to 145.7 for Idaho. A comparison of the rates for the chief hazards in the principal mining States is given in the discussion that follows. Although changes in a State's accident rates from year to year normally indicate progress in the promotion of safety in mining within a State, it should be borne in mind, when comparing the record of one State with that of another, that the rates for the several States may differ because of inherent differences in mining hazards due to the nature and position of ore bodies and to differences in methods of mining that must be employed to extract the ore.

The accident rates for certain Western States in 1935 are not perfectly comparable with the rates for the same States in 1934, as the figures for 1935 covered the number of man-hours worked but not the number of accidents at many prospects and small properties that had not been canvassed in previous years. Most of these properties employed one or two men and produced only a little ore which contained small quantities of metal (usually a few ounces of gold or silver). However, their total of man-hours worked tended to lower the accident-frequency rates of the States concerned. Thus, an apparent reduction in the rate for some types of accidents may have been due partly to the broadening of the man-hour basis on which the accident rate was computed; however, higher rates, in 1935 compared with 1934 undoubtedly indicate an actual increase in accident frequency. Therefore, in the following discussion attention is called to such increases in the States in which the prospects and small mines were operating. The States affected were Arizona, California, Colorado, Idaho, Montana, New Mexico, Oregon, Utah, and Washington.

TABLE 22.—All mines: Nonfatal-injury rates per million man-hours worked underground and in open-cut mines, by principal causes for important States, during the year ended Dec. 31, 1935

UNDERGROUND

Cause	Minnesota	Alabama	Michigan	South Dakota	Missouri	Colorado	Nevada	Oklahoma	Arizona	United States	New Mexico	Utah	Kansas	Montana	California	Idaho
Fall of rock or ore from roof or wall.....	4.90	2.41	5.06	10.40	6.73	14.12	13.47	8.82	16.68	16.01	12.37	19.50	5.43	26.54	26.65	34.66
Rock or ore while loading at working face.....	1.15	2.67	1.97	4.51	8.97	3.81	5.77	20.76	6.12	8.18	11.83	5.15	26.54	8.27	13.72	14.09
Haulage.....	.58	6.42	1.97	5.20	13.46	6.02	4.26	1.10	9.38	9.13	8.43	9.67	19.10	14.30	11.58	19.45
Hand tools.....	.86	2.14	1.54	4.85	1.68	8.47	4.20	2.56	7.69	6.46	13.49	7.49	1.21	1.31	12.29	15.20
Drilling.....	.86	2.67	1.82	3.46	3.92	12.04	9.45	6.94	9.51	7.82	10.96	7.02	9.05	1.32	16.51	9.45
Handling materials (other than rock or ore).....	2.88	1.87	4.07	4.51	.....	5.40	6.30	3.98	5.47	8.86	4.78	9.05	1.21	24.27	13.29	21.32
Falling down chutes, winze, raise, or stope.....	.29	.97	1.12	1.73	.56	5.40	4.02	4.55	4.17	5.45	4.50	3.59	3.62	4.23	17.51	8.90
Run of ore from chute or pocket.....	.84	1.60	1.69	1.73	1.12	4.01	2.62	4.28	3.63	3.29	3.97	2.34	1.60	2.64	4.57	2.04
Machinery.....	.86	1.87	.84	1.69	1.68	2.95	1.02	1.44	2.56	1.84	3.09	2.26	1.24	1.09	3.43	3.15
Shaft.....	4.04	4.54	5.48	1.04	1.12	1.45	1.57	2.58	2.35	1.71	1.09	4.22	4.22	1.04	4.22	2.04
All other underground.....	4.04	4.54	5.48	5.55	8.97	11.42	20.82	16.78	14.07	13.90	10.41	20.76	18.10	15.90	13.01	25.39
All causes (underground including shaft).....	15.56	25.40	26.26	43.67	48.21	76.01	76.09	79.07	80.65	82.65	84.62	88.31	89.89	100.21	139.78	145.69

OPEN-CUT

Cause	Utah	Minnesota	Alaska	Michigan	Arizona	United States	Florida	Tennessee	Nevada	North Carolina	Alabama	California
Handling materials.....	1.04	2.48	.....	9.45	0.68	5.79	5.24	7.50	8.60	9.47	13.65	17.60
Hand tools.....	.....	.45	2.42	3.15	2.02	3.41	3.41	8.33	4.78	7.88	12.29	9.10
Falls of persons.....	1.57	.45	2.42	.....	1.35	3.76	5.24	2.50	6.69	9.47	9.55	12.75
Falls or slides of rock or ore.....	.52	.22	.....	2.02	2.02	2.52	.....	.....	3.82	4.73	1.36	6.68
Machinery.....	.52	.68	3.62	3.15	2.02	2.22	2.62	.83	.96	6.31	1.36	9.10
Haulage.....	.52	1.13	.....	.....	5.40	2.22	3.28	1.67	3.82	9.47	4.10	3.03
Power shovels.....	1.04	1.13	.....	.....	1.35	1.24	6.65	5.83	1.91	.....	4.10	6.61
All other causes.....	.52	1.80	4.83	3.15	6.07	5.00	8.52	4.16	3.82	9.47	13.65	5.46
All causes (open-cut).....	5.74	8.34	13.29	18.90	20.91	26.16	26.86	30.82	34.42	56.80	60.06	64.33

Alabama.—Alabama had an injury rate of 25.40 per million man-hours of exposure for all classes of accidents underground; the rate was 69 percent lower than the corresponding average rate for the United States as a whole and 4 percent better than in 1934, although loading accidents increased. The Alabama record was better than the national average for all 10 leading causes of mine accidents in the United States except machinery, and for this class the State rate was a fraction higher than the average for the country as a whole.

Arizona.—The underground injury rate for Arizona mines was between 2 and 3 percent lower than the average rate for the United States. The slight difference in favor of the State might or might not be significant, depending upon the degree of accuracy of the reports furnished by the mining companies to the Bureau of Mines. The Arizona rate was worse than the national average for accidents from hand tools, fall of roof, haulage, run of ore, drilling, and shaft accidents, but it was better for loading ore, falling down chutes and raises, handling materials, and machinery. In Arizona, accidents charged to loading ore, falling down chutes, etc., run of ore, and drilling increased in 1935 over 1934.

California.—California mines reported higher rates for all 10 leading causes of underground accidents; the State rate was 69 percent higher than the average for the United States.

Idaho.—The accident-frequency rate for underground mining in Idaho increased 14 percent in 1935 and was 76 percent higher than the average for all States. Reports for 1935 showed that the State rate increased for all 10 leading causes of accidents except loading ore, run of ore, and shaft accidents. The Idaho rate exceeded that for the United States as a whole for 9 of the 10 leading causes, the exception being accidents from run of ore from chute or pocket.

Kansas.—Underground accidents in Kansas mines caused by fall of rock or ore from the roof or wall increased in 1935. The State rate exceeded that for the country as a whole for accidents due to loading ore, haulage, and drilling and in shafts.

Michigan.—Mine-safety conditions in Michigan were favorable in 1935 compared with the United States as a whole and with the State's record for 1934. The injury rate for underground workers was only 26.26 per million man-hours worked underground; this was 68 percent lower than the average for the United States and 27 percent lower than the Michigan rate for 1934. The State record improved in all of the leading causes of underground accidents except haulage, run of ore from chute or pocket, and handling materials. Compared with the average for the United States, the Michigan rate was better for all 10 principal causes of accidents.

Minnesota.—The injury rate for underground workers was even more favorable for Minnesota than for Michigan and Alabama; the record showed only 15.56 nonfatal accidents per million man-hours of exposure underground, or nearly the same rate as that in 1934. Increased rates were reported for falls of rock or ore from the roof or wall, hand tools, and drilling, but these increases were offset by reductions in the rates for other classes of accidents. The rates for Minnesota, compared with those for the United States as a whole, were decidedly favorable for all 10 leading causes of accidents.

Montana.—The injury rate due to accidents among underground mine workers increased in Montana in 1935 compared with 1934.

The rates increased for accidents caused by falls of rock or ore from the roof or wall, haulage, persons falling down chutes and raises, run of ore from chute or pocket, and handling materials. The Montana rate for all underground nonfatal accidents was 21 percent higher than the corresponding rate for the United States as a whole owing to a relatively larger number of accidents due to falls of rock or ore from the roof or wall, loading ore at the face, haulage, and handling materials.

Nevada.—The accident rate for underground employees in Nevada was 8 percent more favorable than the average rate for the United States as a whole. The more favorable record for the State was due to a relatively smaller number of injuries from all of the 10 leading causes of accidents except drilling; the rate for drilling accidents was 21 percent higher for Nevada than for the United States as a whole. Compared with 1934, the reports revealed higher accident rates for run of ore, drilling, and machinery.

New Mexico.—Mining companies in New Mexico reported higher rates in 1935 for accidents caused by run of ore from chute or pocket and handling materials. The State rate for underground mining was slightly higher than the average rate for the United States.

Oklahoma.—Reports covering mines in Oklahoma showed increased accident rates for hand tools, machinery, falls of persons, and accidents in shafts. The State record for all underground accidents, however, was 5 percent better than the average for the country as a whole.

South Dakota.—The accident-frequency rate of underground accidents in mines in South Dakota increased for 5 of the 10 leading causes of accidents—loading accidents, hand tools, run of ore, drilling, and shaft accidents. However, the combined rate for all accidents underground in the mines of South Dakota was 26 percent lower and better than in 1934 and 47 percent better than the average rate for underground accidents in the United States as a whole. The rate for underground accidents in 1934 was 34 percent better than the national average.

Utah.—Reports covering underground mining in Utah revealed increases in the accident rates for loading ore at the face and machinery. The Utah rate for all classes of accidents underground was 7 percent higher than the corresponding average rate for the United States as a whole.

ACCIDENTS CLASSIFIED BY MINING METHODS

The classification of mining methods used in this bulletin was originated by the Mining Division of the Bureau of Mines for use in the division's studies of the relative efficiency of various mining methods from the standpoint of productivity and costs. The classification was first used in this series of statistical bulletins on accidents in the bulletin covering the calendar year 1929; it is as follows:

A. Underground methods:

1. Open stope, including the room-and-pillar method and sublevel stoping.
2. Shrinkage.
3. Cut-and-fill.
4. Square-set.
5. Block caving.
6. Sublevel caving.
7. Top slicing.

B. Surface methods:

8. Open-cut with power shovel.
9. Open-cut with power scraper.
10. Open-cut, hand loading only.
11. Hydrauliclicking.
12. Dredging.

From the standpoint of the number of companies represented and the number of men employed in the mines the most widely used operating method in metal and nonmetal mines employing 25 or more men is the open-stope method, including the room-and-pillar method and sublevel stoping.

Figures for 1935 showed that the combined accident-frequency rate for fatalities and injuries in underground mining was most favorable for top slicing, the next lowest accident rate being that for sublevel caving. The highest rates were reported by mines using block-caving methods.

It should be made clear in this connection that a mining company is not free to choose any method of mining that officials may prefer or to adopt any method solely from the standpoint of safety. The method to be used is determined mainly by the type of deposit, the character and value of the ore, and the possibility of extracting the ore at an economically sound price.

Table 23 shows the number of employees in mines using each of the various methods and the comparative accident-frequency rates of these mines for fatalities and nonfatal lost-time injuries. Each mine is classified according to its principal mining method, as shown in the company report to the Bureau of Mines.

The figures for open-stope methods relate chiefly to the iron-ore mines of Alabama and Michigan and the lead-zinc mines of Kansas, Missouri, and Oklahoma. Shrinkage methods were reported mainly for gold and silver mines in some Western States. Cut-and-fill methods were shown for gold and silver mines in Idaho, California, and Colorado as well as for several copper mines in Arizona. Mining by square-set methods was reported by copper mines in Montana, lead-zinc-silver-gold mines in Idaho and Utah, and gold mines in California. The figures for block caving represent the experience of a few metal mines in several Western States and in Alaska, Michigan, and Arkansas. All figures for sublevel caving were reported by iron-ore mines in Michigan, Minnesota, and Wisconsin. The data for top slicing represent mainly the experience of iron-ore mines in Michigan and Minnesota. Open-pit mining with power shovels shows the experience of iron-ore mines in Minnesota. Open-pit mining with hand loading represents the experience of several mines producing nonmetallic minerals, chiefly in the Eastern States.

TABLE 23.—Metal-mine accident data, grouped by mining methods, during the year ended Dec. 31, 1935, for selected companies, with revised figures for 1934¹

1935

Method of mining	Number of mines	Number of States	Average days active	Man-days	Men employed	Man-hours of employment	Number killed	Number injured	Rate per million man-hours	
									Killed	Injured
Open stope, including room-and-pillar and sub-level stoping.....	137	25	229	2,700,612	11,776	21,284,963	29	1,645	1.36	77.28
Shrinkage.....	22	9	261	372,780	1,427	2,982,258	5	377	1.68	126.41
Cut-and-fill.....	25	9	291	879,572	3,021	7,043,572	15	732	2.13	103.92
Square-set.....	41	9	304	1,447,041	4,764	11,396,722	16	1,526	1.40	133.90
Block caving.....	7	6	210	258,477	1,231	2,068,210	4	324	1.93	156.66
Sublevel caving.....	16	5	224	370,876	1,654	2,973,007	3	75	1.01	25.23
Top slicing.....	20	4	231	591,952	2,562	4,735,627	2	96	.42	20.27
Open-cut, with power shovel.....	38	13	261	1,157,565	4,442	9,389,596	2	154	.21	16.40
Open-cut, hand loading only.....	5	5	173	39,352	227	311,816	1	7	3.21	22.45
Total.....	311	-----	251	7,818,227	31,104	62,185,771	77	4,936	1.24	79.38

1934²

Open stope, including room-and-pillar and sub-level stoping.....	76	18	211	1,958,063	9,273	15,453,265	21	1,280	1.36	82.83
Shrinkage.....	17	7	295	351,439	1,191	2,799,456	8	328	2.86	117.17
Cut-and-fill.....	15	7	262	734,218	2,798	5,873,750	6	598	1.02	101.81
Square-set.....	31	9	223	1,311,697	5,881	10,439,397	12	1,377	1.15	131.90
Block caving.....	6	6	296	245,669	830	1,964,523	7	252	3.56	128.28
Sublevel caving.....	16	3	221	415,925	1,880	3,327,406	1	83	.30	24.94
Top slicing.....	16	3	216	507,327	2,347	4,058,618	2	81	.49	19.96
Open-cut, with power shovel.....	43	14	193	903,335	4,671	7,381,854	4	108	.54	14.63
Open-cut, hand loading only.....	3	3	205	25,239	123	201,909	-----	11	-----	54.48
Total.....	223	-----	223	6,452,812	28,994	51,500,178	61	4,118	1.18	79.96

¹ Underground and open-cut only. No reports used for mines where less than 25 men were employed.
² This table, containing revised figures for 1934, should be substituted for table 23 in Bulletin 398, Metal-mine Accidents in 1934, as the latter inadvertently was not limited to underground and open-cut data but included figures for surface shops and yards at these companies.

PLACER MINES

As reports for placer mines covered many more properties in 1935 than in 1934, the number of employees and the number of accidents in 1935 are not entirely comparable with the corresponding numbers revealed by the Bureau of Mines canvasses for previous years. However, the reports for previous years as well as those for 1935 showed the various types of hazards to which men working at placer properties are exposed, and these are indicated in table 26 for 1934 and 1935. The number of men working, which includes estimates for many small properties which are known to have produced some gold but which did not furnish reports of their operations to the Bureau, was 13,014, as shown in tables 2 and 24. Most of these men were engaged in

surface work (1,698 men at hydraulic operations and 2,517 at dredging operations), but 1,066 men worked underground. The average working time for all employees was 148 days or 1,176 hours per man, making a total of 15,302,730 man-hours worked at all placers during the year. Accidents resulted in 11 fatalities and 637 nonfatal injuries, which gave a fatality rate of 0.72 and an injury rate of 41.6 per million man-hours of exposure to hazard.

It has never been practicable for the Bureau of Mines to obtain complete reports from all placer mines in the United States. The collection of reports is attended with difficulties owing to the short period of operation at many prospects and mines employing 1 or 2 men and the impossibility of learning the names and addresses of all individuals and companies doing small amounts of work in out-of-the-way places. The figures given in this bulletin, insofar as they relate to placers, reveal accident rates that are probably lower than they would be if complete reports covering all properties could be obtained. The data are included in this bulletin to show the rates with as much accuracy as possible, even though the accuracy is considerably short of what is desired.

TABLE 24.—*Placer mines: Men employed, man-days of employment, and number killed and injured during the year ended Dec. 31, 1935*

	Under-ground	Surface	Dredging	Hydrau-licking	Total
Men employed.....	1,066	7,733	2,517	1,698	13,014
Man-days.....	194,401	816,957	623,457	288,507	1,923,322
Average days active.....	182	106	248	170	148
Man-hours of employment.....	1,538,455	6,531,467	4,981,591	2,251,217	15,302,730
Number killed.....	8	1	2	11	11
Number injured.....	154	151	241	91	637
Killed per million man-hours.....	5.20	.20	.20	.89	.72
Injured per million man-hours.....	100.10	23.12	48.38	40.42	41.63

TABLE 25.—*Placer mines: Severity of injury during the years ended Dec. 31, 1934 and 1935*

	1934					1935					Grand total
	Killed	Perma-nent total disa-bility	Perma-nent partial disa-bility	Tempo-rary	Total non-fatal	Killed	Perma-nent total disa-bility	Perma-nent partial disa-bility	Tempo-rary	Total non-fatal	
Underground.....	1			81	81	82	8	3	151	154	162
Surface.....		2		147	149	149		3	148	151	151
Dredging.....	3			120	120	123	1	7	134	241	242
Hydraulicking.....	2		1	93	94	96	2	1	60	61	93
Total.....	6	3	3	441	444	470	11	14	623	637	648

TABLE 26.—*Placer mines: Number killed and injured, by causes, during the years ended Dec. 31, 1934 and 1935*

Cause	1934		1935	
	Killed	Injured	Killed	Injured
Underground:				
1. Fall of rock or ore from roof or wall.....		13	5	34
2. Rock or ore while loading at working face.....		12		19
3. Hand tools.....		14		15
4. Explosives.....	1	1	3	1
5. Haulage.....		6		24
6. Falling down chute, winze, raise, or stope.....		9		18
7. Run of ore from chute or pocket.....				1
8. Drilling.....		9		8
9. Electricity.....				1
10. Machinery (other than locomotives or drills).....		2		5
11. Mine fires.....				
12. Suffocation from natural gases.....		1		2
13. Inrush of water.....				1
14. Stepping on nail.....		1		4
15. Handling materials (other than rock or ore).....		6		11
16. Other causes.....		5		6
Total, underground.....	1	79	8	150
Shaft:				
17. Falling down shaft.....				1
18. Objects falling down shaft.....				
19. Breaking of cables.....				
20. Overwinding.....				
21. Skip, cage, or bucket.....		2		3
22. Other causes.....				
Total, shaft.....		2		4
Surface:				
1. Mine cars, mine locomotives, gravity or aerial trams.....		5		5
2. Railway cars and locomotives.....				1
3. Run or fall of ore in or from ore bins.....				2
4. Falls of persons.....		28		27
5. Stepping on nail.....		7		9
6. Hand tools.....		29		16
7. Electricity.....		1		2
8. Machinery.....		24		13
9. Handling materials.....		20		17
10. Other causes.....		35		59
Total, surface.....		149		151
Dredging:				
1. Machinery.....	1	18		37
2. Electricity.....	1	2		3
3. Boiler explosions or bursting steam pipes.....				1
4. Falls of persons.....		29		38
5. Hand tools.....	1	16		32
6. Handling materials.....		23		59
7. Other causes.....		32	1	71
Total, dredging.....	3	120	1	241
Hydrauliclicking:				
1. Cave of bank.....	1	8	2	8
2. Explosives.....		2		
3. Hydraulic giants.....	1			5
4. Falls of persons.....		24		19
5. Rock while handling.....				4
6. Hand tools.....		10		15
7. Machinery, derricks, etc.....		6		10
8. Handling materials (other than rock or ore).....		31		18
9. Other causes.....		13		12
Total, hydrauliclicking.....	2	94	2	91
Grand total, 1935.....	6	444	11	637

MINES OPERATED WITHOUT FATAL ACCIDENTS

All of the 164 fatal accidents at metal and nonmetal mines in 1935 occurred at 124 mines. Reports from operating companies revealed that 10,695 individual mines were operated during the year without a fatal accident. Mines without fatal accidents accounted for 76 percent of the total number of men employed in mining metallic and nonmetallic minerals in the United States. Mines without fatal accidents also accounted for 70 percent of the total number of man-hours worked in the entire industry. The 124 mines at which 164 men were killed by accidents were much larger, on the average, than were the mines that had no fatalities; they averaged 176 men per mine compared with 7 men per mine for the fatality-free properties. The fatality rate of mines having fatalities was 3.35 per million man-hours of employment compared with 1.02 for the industry as a whole. The nonfatal-injury rate for mines having fatal accidents was 71.70, compared with 59.60 for mines that had no fatalities and 63.27 for the entire industry. (See table 27.)

The States in which no fatal accidents occurred at metal and nonmetal mines during 1935 are shown in tables 28 and 29. Of the States in which fatal accidents occurred, Kansas reported the highest percentage of its mine employees working in mines that operated without a fatality; nearly 98 percent of its mine workers were employed in fatality-free mines. The relative standing of the States according to percentage of mine workers and man-hours accounted for by mines that had no fatal accidents is shown in tables 28 and 29.

TABLE 27.—*Comparative fatal and nonfatal accident data for metal and nonmetal mines (other than coal mines) in the United States in 1935*

	Mines that had no fatal accidents	Mines that had fatal accidents	All metal and non-metal mines
Number of mines.....	10,695	124	10,819
Number of employees.....	70,462	21,852	92,314
Proportion of total employees.....percent..	76.3	23.7	100
Number of employees per mine.....	7	176	9
Man-days of employment.....	14,158,207	6,194,165	20,352,372
Average worked per man.....days..	201	283	220
Man-hours of employment.....	112,323,590	48,979,081	161,302,671
Average worked per man.....hours..	1,594	2,241	1,747
Number of men killed.....	-----	164	164
Number of men injured.....	6,694	3,512	10,206
Death rate per million man-hours.....	-----	3.35	1.02
Injury rate per million man-hours.....	59.60	71.70	63.27

TABLE 28.—Metal and nonmetal mines (other than coal mines): Number of men employed in 1935

State	At mines that had fatalities	At mines that had no fatalities	Employees represented by mines that had no fatalities (percent)	State	At mines that had fatalities	At mines that had no fatalities	Employees represented by mines that had no fatalities (percent)
Wisconsin		756	100.0	Nevada	548	3,846	87.5
New Jersey		684	100.0	Washington	101	686	87.2
Virginia		683	100.0	Tennessee	219	1,223	84.8
Florida		681	100.0	Alaska	577	3,026	84.0
Arkansas		671	100.0	Illinois	46	199	81.2
Kentucky		653	100.0	Minnesota	1,000	4,135	80.5
Georgia		459	100.0	Texas	394	1,546	79.7
Wyoming		335	100.0	Colorado	1,338	4,808	78.2
Ohio		94	100.0	United States	21,852	70,462	76.3
Iowa		88	100.0	Michigan	1,470	4,734	76.3
Maine		84	100.0	Montana	2,095	5,472	72.3
New Hampshire		81	100.0	Idaho	1,668	3,648	68.6
South Carolina		80	100.0	Arizona	2,460	5,152	67.7
Connecticut		71	100.0	New Mexico	757	1,377	64.5
Vermont		66	100.0	Utah	1,779	2,319	56.6
Other States ¹		23	100.0	Missouri	898	1,157	56.3
Kansas	30	1,340	97.8	Louisiana	372	367	49.7
North Carolina	22	701	97.0	Alabama	1,999	1,224	38.0
Oregon	76	1,461	95.1	South Dakota	1,836	323	15.0
Oklahoma	251	2,505	90.9	Pennsylvania	194	17	8.1
California	1,590	12,701	88.9				
New York	132	986	88.2				

¹ Includes Indiana, Maryland, Massachusetts, Nebraska, and West Virginia.

TABLE 29.—Metal and nonmetal mines (other than coal mines): Number of man-hours worked in 1935

State	At mines that had fatalities	At mines that had no fatalities	Man-hours represented by mines that had no fatalities (percent)	State	At mines that had fatalities	At mines that had no fatalities	Man-hours represented by mines that had no fatalities (percent)
Florida		1,526,565	100.0	Nevada	1,364,202	6,568,559	82.8
Wisconsin		1,387,062	100.0	Illinois	94,624	410,358	81.3
New Jersey		1,227,862	100.0	Minnesota	2,081,797	7,743,527	78.8
Virginia		1,063,868	100.0	Alaska	1,486,392	5,406,912	78.4
Kentucky		1,040,155	100.0	Texas	802,860	3,076,789	78.1
Arkansas		672,175	100.0	Michigan	2,758,181	8,380,882	75.2
Georgia		586,773	100.0	Washington	256,136	743,238	74.4
Wyoming		426,711	100.0	United States	48,979,081	112,323,590	69.6
New Hampshire		168,979	100.0	Colorado	3,543,096	7,604,531	68.2
Ohio		130,208	100.0	Montana	4,962,768	8,792,995	63.9
South Carolina		123,469	100.0	New Mexico	1,871,552	2,474,087	56.9
Connecticut		109,943	100.0	Idaho	3,484,270	4,453,623	56.1
Maine		103,160	100.0	Arizona	5,408,770	6,746,668	55.5
Vermont		98,986	100.0	Missouri	1,207,376	1,454,185	54.6
Iowa		97,688	100.0	Utah	4,561,112	4,625,190	50.3
Other States ¹		34,675	100.0	Louisiana	1,086,240	856,778	44.1
Kansas	53,040	1,839,100	97.2	Alabama	3,406,259	2,075,175	37.9
North Carolina	43,640	1,054,877	95.8	South Dakota	4,626,720	638,693	12.1
Oregon	215,840	1,710,949	88.8	Pennsylvania	304,816	32,663	9.7
Oklahoma	571,730	3,308,985	85.3				
New York	266,251	1,476,603	84.7				
Tennessee	456,230	2,462,945	84.4				
California	4,002,179	19,587,899	83.0				

¹ See footnote to table 23.

SUMMARY TABLES

Table 30 summarizes the number of accidents and the accident rates in mines producing metallic ores and nonmetallic minerals other than coal, sand, gravel, and clay, for 1935 and previous years, according to the severity of the accident, that is, whether it resulted in the death of the injured worker or in permanent total, permanent partial, or temporary disability for longer than the day on which the accident occurred.

Table 31 summarizes statistical data covering the number of employees and the number of accidents in and about the metal and nonmetal mines of the United States for the 25-year period 1911-35. The accident rates shown in the table have been computed on a basis of 1,000 men working 300 days each year. The rates are shown on a 300-day working basis because reports of the number of man-hours worked at the mines were not collected for the full period covered by the table. The accident rates in table 31 have been broken down for the five broad classes of mining, and table 32 shows rates for each of the five groups.

Table 33 shows the number of men working, the number of accidents, and the accident rates per million man-hours of exposure for most of the mining and metallurgical industries of the United States during the calendar year 1935. The table does not cover iron blast furnaces, sand, gravel, and clay pits, or oil and gas wells, as Nationwide accident data for these industries have not been collected by the Bureau of Mines. The rates in the last two columns of the table show the comparative frequency of fatal and nonfatal accidents in the various branches of the mineral industry for 1935.

TABLE 30.—All mines: Number of fatalities and injuries and fatality and injury rates per thousand 300-day workers, classified by severity of injury, 1926-35

NUMBER OF ACCIDENTS							
Severity of injury	Total 1926-30	1931	1932	1933	1934	1935	Total 1931-35
Fatal.....	1,676	158	107	95	116	164	640
Permanent total ¹	94	15	10	5	2	7	39
Permanent partial ²	2,560	292	167	127	191	246	1,023
Temporary ³	113,998	8,402	4,837	5,793	7,699	9,953	36,684
Total.....	118,328	8,867	5,121	6,020	8,008	10,370	38,386

RATES PER THOUSAND 300-DAY WORKERS							
Fatal.....	3.02	2.53	2.89	2.45	2.36	2.42	2.51
Permanent total ¹.....	.17	.24	.27	.13	.04	.10	.15
Permanent partial ²	4.61	4.68	4.52	3.27	3.89	3.63	4.01
Temporary ³	205.42	134.64	130.79	149.28	156.88	146.71	143.79
Total.....	213.22	142.09	138.47	155.13	163.17	152.86	150.47
Average number of 300-day workers per year.....	554,956	62,405	36,984	38,807	49,077	67,841	255,114

¹ Permanent total disability: Loss of both legs or arms, 1 leg and 1 arm, total loss of eyesight, paralysis, or other condition permanently incapacitating workman from doing any work of a gainful occupation.

² Permanent partial disability: Loss of 1 foot, leg, arm, hand, or eye, 1 or more fingers, 1 or more toes, any dislocation where ligaments are severed, or any other injury known in surgery to be permanent partial disability.

³ Disability for more than remainder of day of accident.

TABLE 31.—Number of men employed, man-days of employment, and number of men killed and injured at all mines (except coal mines) in the United States, 1911-35

Year	Average days active	Men employed		Total shifts	Number killed		Number injured	
		Actual number	Equivalent in 300-day workers (calculated)		Total	Per thousand 300-day workers (calculated)	Total	Per thousand 300-day workers (calculated)
1911.....	282	165,979	156,088	46,826,573	695	4.45	26,577	170.27
1912.....	287	168,550	161,059	48,317,800	661	4.10	30,734	190.82
1913.....	288	191,276	183,594	55,077,855	683	3.72	32,971	179.59
1914.....	271	158,115	142,620	42,785,840	559	3.92	30,216	211.87
1915.....	280	152,118	141,997	42,599,015	553	3.89	35,295	248.56
Average for 5 years..	282	167,208	157,072	47,121,417	630	4.01	31,159	198.37
1916.....	282	204,685	192,455	57,736,425	697	3.62	48,237	250.64
1917.....	287	200,579	192,085	57,625,811	852	4.44	46,286	240.97
1918.....	297	182,606	181,006	54,301,748	646	3.57	42,915	237.09
1919.....	279	145,262	134,871	40,461,350	468	3.47	31,506	233.60
1920.....	296	136,583	134,540	40,361,893	425	3.16	32,562	242.02
Average for 5 years..	288	173,943	166,991	50,097,445	618	3.70	40,301	241.34
Average for 10 years..	285	170,576	162,031	48,609,431	624	3.85	35,730	220.51
1921.....	238	93,929	74,509	22,352,702	230	3.09	18,604	249.69
1922.....	276	105,697	97,138	29,141,293	344	3.54	26,080	268.48
1923.....	297	123,279	121,866	36,559,805	367	3.01	33,563	275.41
1924.....	290	123,128	119,113	35,734,008	418	3.51	33,118	278.04
1925.....	293	126,713	123,908	37,172,359	371	2.99	35,132	283.53
Average for 5 years..	281	114,549	107,307	32,192,033	346	3.23	29,299	273.04
Average for 15 years..	284	151,933	143,790	43,136,965	531	3.69	33,586	233.58
1926.....	291	127,823	123,870	37,160,978	430	3.47	30,350	245.01
1927.....	284	119,699	113,447	34,033,963	352	3.10	25,133	221.54
1928.....	288	113,866	109,345	32,803,610	273	2.50	22,483	205.61
1929.....	292	118,735	115,394	34,618,120	350	3.03	23,092	200.11
1930.....	270	103,233	92,900	27,869,982	271	2.92	15,594	167.86
Average for 5 years..	285	116,671	110,991	33,297,330	335	3.02	23,330	210.20
Average for 20 years..	284	143,093	135,590	40,677,056	482	3.55	31,022	228.79
1931.....	231	80,940	62,405	18,721,486	158	2.53	8,709	139.56
1932.....	208	53,288	36,984	11,095,167	107	2.89	5,014	135.57
1933.....	204	57,016	38,807	11,642,113	95	2.45	5,925	152.68
1934.....	221	66,645	49,077	14,723,215	116	2.36	7,892	160.81
1935.....	220	92,454	67,841	20,352,372	164	2.42	10,206	150.44
Average for 5 years..	219	70,041	51,023	15,306,871	128	2.51	7,549	147.95
Average for 25 years..	271	128,482	118,677	35,603,019	411	3.46	26,328	221.85

TABLE 32.—United States metal and nonmetallic mineral mines: Accident rates per thousand 300-day workers, 1911–35

Year	Copper		Gold, silver, miscellaneous		Iron		Lead and zinc (Mississippi Valley)		Nonmetallic mineral		Total	
	Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured
1911.....	5.18	225.3	4.28	80.3	4.64	252.3	4.03	139.4	2.01	34.0	4.45	170.3
1912.....	4.53	258.4	4.32	93.0	3.96	241.8	4.28	158.3	1.66	66.4	4.09	190.1
1913.....	4.08	230.8	3.83	70.4	3.29	268.3	3.90	133.5	3.02	84.9	3.72	179.6
1914.....	3.85	312.2	4.06	126.9	3.78	224.1	4.32	189.0	3.73	99.9	3.92	211.9
1915.....	3.72	322.0	4.79	201.5	2.88	233.5	5.37	238.3	2.43	107.8	3.89	248.6
1916.....	3.64	319.6	4.05	190.8	3.41	240.2	3.14	263.1	3.00	144.7	3.62	250.6
1917.....	5.88	313.4	4.03	172.5	3.54	227.5	4.09	273.0	2.48	123.6	4.44	241.0
1918.....	3.45	322.1	4.27	185.2	3.45	185.5	3.58	319.5	1.67	104.7	3.57	237.1
1919.....	3.54	309.6	4.41	191.3	3.09	202.4	4.13	292.3	1.65	139.3	3.47	233.6
1920.....	3.43	323.2	4.20	204.8	2.34	200.5	3.27	328.0	2.89	161.9	3.16	242.0
1921.....	3.70	317.5	3.29	225.5	3.04	210.9	2.58	379.7	1.98	215.5	3.09	249.7
1922.....	3.00	320.8	5.35	260.3	3.00	177.4	2.64	464.2	2.39	247.5	3.54	268.5
1923.....	3.11	349.1	3.93	298.9	2.38	150.2	2.73	495.7	2.67	212.5	3.01	275.4
1924.....	3.55	347.8	4.99	297.8	2.95	151.0	2.76	464.2	1.94	178.7	3.51	278.0
1925.....	2.94	350.6	3.83	307.4	2.54	159.4	3.32	468.1	1.71	165.4	2.99	283.5
1926.....	3.45	288.3	3.27	299.5	4.23	133.9	3.05	304.2	2.62	190.7	3.47	245.0
1927.....	3.46	261.2	3.91	279.8	2.45	114.6	2.64	297.7	2.19	171.2	3.10	221.5
1928.....	3.03	221.0	2.60	268.7	2.16	98.1	1.62	295.7	2.13	168.6	2.50	205.6
1929.....	3.03	223.8	3.66	269.4	2.98	89.6	2.08	238.3	2.29	168.1	3.03	200.1
1930.....	2.76	193.5	4.49	239.7	2.68	81.4	1.63	176.6	.75	138.3	2.92	167.9
1931.....	3.01	152.5	2.88	190.0	1.91	52.7	2.56	176.6	1.63	124.3	2.53	139.6
1932.....	3.01	112.5	3.66	179.3	1.18	44.6	3.95	164.8	1.56	117.6	2.89	135.6
1933.....	2.49	130.3	3.20	204.0	1.82	50.6	.85	147.6	1.39	129.3	2.45	152.7
1934.....	1.96	109.0	3.33	229.5	1.59	48.3	.91	196.1	1.23	121.3	2.36	160.8
1935.....	2.05	157.80	2.86	182.71	2.15	42.90	2.26	166.04	1.01	116.91	2.42	150.44

TABLE 33.—*Accident data, including rates for different branches of mineral industries in 1935*

Industry	Average days active	Men employed	Man-days	Man-hours	Weighted average length of shift	Man-hours per man per year	Killed	Injured	Number killed or injured per million man-hours	
									Killed	Injured
1. Coal mines.....	180	565,202	101,571,654	732,607,581	7.21	1,296	1,242	65,575	1.70	89.51
Bituminous.....	178	462,354	82,291,724	578,511,200	7.03	1,251	908	47,529	1.67	82.16
Anthracite.....	187	102,848	19,279,930	154,096,381	7.99	1,498	274	18,046	1.78	117.11
2. All metal mines.....	218	83,975	18,266,041	145,134,364	7.95	1,728	157	9,393	1.08	64.72
Copper.....	274	10,188	2,787,083	22,293,255	8.00	2,188	19	1,466	.85	65.76
Gold, silver, and miscellaneous metal.....	219	11,209,789	88,566,720	7,900,000	7.90	1,671	107	6,827	1.21	17.08
Iron.....	211	3,076,768	24,682,644	8,020,000	8.02	1,758	22	440	.89	17.83
Lead and zinc (Mississippi Valley).....	177	6,728	1,192,401	9,591,745	8.04	1,426	9	660	.94	68.81
Nonmetallic mineral.....	250	8,339	2,086,331	16,108,307	7.75	1,939	7	813	.43	50.28
3. All quarries.....	200	73,005	14,623,303	110,033,341	7.52	1,507	51	4,152	.46	37.73
Cement rock.....	227	24,416	5,546,183	39,243,018	7.08	1,607	12	362	.31	9.22
Granite.....	202	6,877	1,866,029	10,555,416	7.62	1,535	6	570	.57	54.00
Limestone.....	187	30,973	5,804,752	45,197,391	7.79	1,459	24	2,412	.53	33.37
Marble.....	210	2,441	512,481	4,016,819	7.84	1,646	1	176	.25	43.82
Sandstone and bluestone.....	167	2,739	457,217	3,688,135	8.07	1,347	243	1,648	.....	65.89
Slate.....	184	2,063	379,385	3,097,339	8.16	1,501	2	168	.....	54.24
Traprock.....	154	3,496	537,256	4,235,223	7.88	1,211	6	221	1.42	52.18
In and about quarry.....	177	32,629	5,762,015	44,267,391	7.68	1,357	35	2,712	.79	61.26
In outside works.....	219	40,376	8,861,288	65,765,950	7.42	1,629	16	1,440	.24	21.90
4. Metallurgical plants.....	291	36,493	10,631,513	83,923,699	7.89	2,300	28	1,961	.33	23.37
Ore-dressing plants.....	238	11,841	2,817,005	22,577,689	8.01	1,907	7	631	.31	27.95
Smelters.....	324	14,675	4,752,380	37,160,291	7.82	2,532	14	821	.38	22.09
Auxiliary works.....	307	9,977	3,062,128	24,185,719	7.90	2,424	7	509	.29	21.05
5. All coke ovens.....	321	16,125	5,175,328	40,941,173	7.91	2,539	10	325	.24	7.94
Beehive.....	182	1,075	196,177	1,370,478	6.99	1,275	.....	62	.....	45.24
Byproduct.....	331	15,050	4,979,151	39,570,695	7.95	2,629	10	263	6.65
Total.....	195	783,139	152,354,170	1,128,808,465	7.41	1,441	1,495	82,219	1.32	72.84

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