DEPARTMENT OF THE INTERIOR
BUREAU OF MINES
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COAL-MINE ACCIDENTS IN THE UNITED STATES AND FOREIGN COUNTRIES

COMPILED BY

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PART I.

COAL-MINE ACCIDENTS IN THE UNITED STATES.

INTRODUCTION.

The lack of comparable and accurate statistics of coal-mine accidents in the United States as a whole led the Bureau of Mines in 1911 to undertake the collection of such data. The importance of such statistics as a basis for remedial legislation can not be overestimated, moreover they serve to indicate the results of the efforts made by the Federal Government, State mining departments, and mine operators throughout the country to lessen the hazard of coal mining. The mining departments of the leading foreign coal-producing countries have long taken cognizance of the importance of such statistics. In Great Britain, official statistics of coal-mine accidents have been collected and published since 1851, in France since 1853, in Austria since 1875, in Germany since 1852, and in Belgium since 1831. The United States not only leads these countries in the production of coal but the output of its coal mines is greater than those of Great Britain, France, Belgium, Austria, India, Japan, and New South Wales combined. Accordingly, it is proper that there should be some official record of the accidents in this, the greatest mining industry not only in the United States but in the world.

It is especially appropriate that this work should have been undertaken by the Bureau of Mines, as, through its investigations of mine accidents in the field, it is constantly in close touch with coal-mining conditions throughout the country. Its engineers are not only able to obtain first-hand information as to a great many accidents, but, through their special training and experience, are able to appreciate the significance of the figures reported by the coal-mine operators, thus aiding an intelligent and uniform classification of the accidents for the country as a whole. Further, the State mining departments and State mine inspectors of every State in the country

having a system of coal-mine inspection are cooperating with the bureau by sending it monthly reports of accidents in the coal mines of their respective States. The receipt of such reports places the bureau in a most advantageous position to publish promptly statistics of these accidents. Although a few years ago accurate statistics of coal-mine accidents in the United States as a whole were entirely lacking, this bureau was able to publish the 1912 statistics within three months after the close of the year and long before corresponding statistics had been issued by the mining departments of the leading foreign coal-producing countries.

The cooperative agreement with the State coal-mine inspectors has not only made possible the prompt publication of the statistics, but it has also enabled the bureau to classify the fatalities by months and according to cause, showing the months in which the greatest and the least number of men were killed and from what causes—something that has never before been accomplished for this country

SOURCE AND SCOPE OF STATISTICS.

The only reliable records available for the compilation of statistics for years prior to 1910 are the official reports of the State mine inspectors. Those reports have therefore been used as a basis for the compilation of statistics prior to 1910. The figures for 1910 were derived from special reports made the bureau through the courtesy of the State mine inspectors supplemented by data furnished by the operators in those States having no system of coal-mine inspection.

The data for 1911 were obtained by the bureau from reports of accidents received from all the coal-mine operators in the country, and the statistics for that year were compiled from their reports after a careful comparison with the State records to which the bureau had access through the kindness of the State officials. In 1912 monthly reports were received from the State mine inspectors covering fatalities for that year. The data from this source were supplemented by reports from the operators in those States where there is no system of coal-mine inspection.

When the compilation of the statistics of accidents for the years, 1896 to 1901, inclusive, was commenced, an attempt was made to classify the fatalities by causes, but this was found to be impossible, owing to the incompleteness of many of the State reports; hence only the total number of fatalities, classified by States, was determined for these years. The reports of many States covered fiscal years that did not coincide with the calendar years or with the fiscal years covered by the reports of other States; some reports listed the deaths of nonemployees, perhaps visitors in a mine, whose deaths were not properly chargeable to the coal-mining industry; others

included deaths from natural causes, such as apoplexy, heart failure, etc., and still others included even suicides and murders. Again, many reports listed the death of nonemployees engaged in rescue work and others did not. The collation of the data from these various reports, therefore, presented many difficulties which were overcome only by a careful examination of the detailed description of each fatal accident as given in the reports and by the assistance afforded by many of the present and former State mine inspectors.

In order that the statistics for the various States might be comparable, an effort was made to exclude deaths of nonemployees; deaths due to natural causes, such as heart failure, apoplexy, etc.; and deaths due to personal violence, such as murder and suicide. Deaths of persons engaged in rescue work were, however, included irrespective of whether such persons were employees or nonemployees, because their deaths are properly chargeable to the mining industry. Further, any mine accident that resulted in death within a year and a day after the accident occurred was considered as "fatal." Under this definition, therefore, the statistics for 1912 as given are subject to slight revision.

As the death rates in some of the State reports are not comparable with those in others, the bureau has in all cases, except where otherwise noted, based the rates showing the number of men killed per 1,000 employed on the total number of employees, both underground and on the surface (coke workers and office employees being excluded), and on the total number of fatal accidents both underground and on the surface. In the same way the death rate per 1,000,000 tons of coal mined has been determined, the short ton of 2,000 pounds being used in all cases. The bureau feels that in presenting the tables embodied in this report it is offering the most accurate and comparable statistics of coal-mine accidents for the country as a whole that have ever been published.

ACKNOWLEDGMENTS.

The Bureau of Mines wishes to express its appreciation for the cordial cooperation and assistance of the State coal-mine inspectors and other officials of the State mining departments throughout the country for furnishing monthly reports of fatal accidents in the coal mines of their respective States. Acknowledgments are also due them and many ex-State mine inspectors for rendering invaluable assistance in verifying and correcting from their records, often at the expense of considerable time and trouble, the data reported to the bureau by the coal-mine operators. To the latter, including corporations, companies, and individuals, the bureau offers its sincere thanks for their good will and their interest in its work, as manifested by their kindness in reporting accidents in their coal mines.

The bureau takes pleasure in making due acknowledgments to C. H. Nesbitt, chief inspector, and to W. W. Kicker, David Kelso, J. F. Webb, W. R. Ray, Frank Hillman, and Thomas Roscoe, district inspectors, of Alabama; to S. S. Smith, United States mine inspector for Alaska; to T. A. Freeze, State mine inspector, of Arkansas; to James Dalrymple, chief inspector, of Colorado; to J. E. Jeffreys, R. T. Rhys, and Edward Sweeney, State mine inspectors, of Iowa, and to L. E. Stamm, secretary to Iowa mine inspectors; to Frank I. Pearce, deputy inspector, of Indiana; to Richard Newsam and Martin Bolt, president and chief clerk of the Illinois State mining board; to Leon Besson, State secretary of mines, of Kansas; to Prof. C. J. Norwood, chief mine inspector, of Kentucky; to William Walters, mine inspector, of Maryland; to P. F. Powers, commissioner of labor, and Andrew Stevenson, mine inspector, of Michigan; to George Bartholomaeus, secretary of the Missouri bureau of mines, mining, and mine inspection, and to H. H. Bradden and Michael Gavin, coal-mine inspectors, of Missouri; to J. B. McDermott, coal-mine inspector, of Montana; to R. H. Beddow, State mine inspector, of New Mexico; to T. R. Atkinson, State engineer, and J. W. Bliss, assistant State mine inspector, of North Dakota; to J. C. Davies, chief inspector of mines, and to Miss Mary A. Kincaid, chief clerk of the State mining board, of Ohio; to Ed Boyle, chief mine inspector, of Oklahoma; to J. E. Roderick, chief of the department of mines, of Pennsylvania; to G. E. Sylvester, chief inspector, and to John Rose and Joseph Richards, district inspectors, of Tennessee; to Isadore Broman, State mine inspector, of Texas; to J. E. Pettit, State coal-mine inspector, of Utah; to J. B. Doherty, commissioner of labor, of Virginia; to D. C. Botting, State coal-mine inspector, of Washington; to John Laing, chief of the West Virginia department of mines, and to Karl F. Schoew, Frank E. Parsons, L. D. Vaughn, W. B. Plaster, E. A. Henry, J. H. Jackson, James Martin, R. Y. Muir, L. B. Holliday, Arthur Mitchell, William Nicholson, and H. H. Pinkney, district inspectors, of West Virginia; and to George Blacker and W. E. Jones, district mine inspectors, of Wyoming.

FATAL COAL-MINE ACCIDENTS IN THE UNITED STATES FROM 1896 TO 1912.

Table 1 shows the production, the number of men employed, and the number of men killed in and about the coal mines of the United States in the calendar years 1896 to 1912, inclusive, and the corresponding death rates per 1,000 men employed and per 1,000,000 short tons of coal mined. The rise and fall of the death rates is also graphically shown in figure 1.

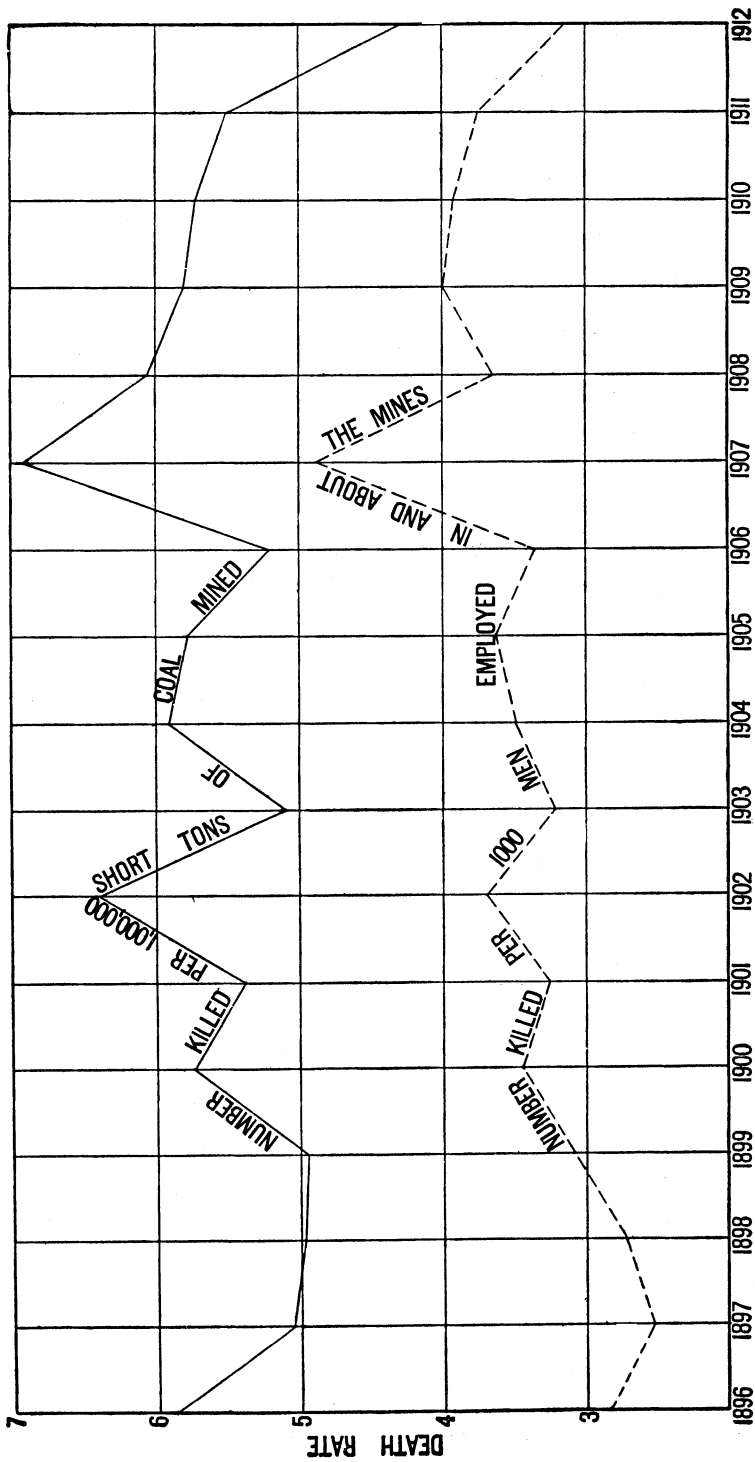


FIGURE 1.—Death rate per 1,000 men employed and per 1,000,000 short tons of coal mined in the United States for the years 1896 to 1912.

TABLE 1.—*Production, number of men employed, and number of men killed in and about the coal mines in the United States in the calendar years 1896 to 1912, inclusive.*[a]

Year.	Production (short tons).[b]	Number employed.[b]	Production (short tons).[c]	Number employed.[c]	Number killed.			Production per death (short tons).
					Total.	Per 1,000 employed.	Per 1,000,000 short tons mined.	
1896	191,986,000	393,162	185,380,000	383,258	1,089	2.84	5.87	170,000
1897	200,229,000	397,701	193,298,000	385,846	975	2.53	5.04	198,000
1898	219,976,000	401,221	213,734,000	391,841	1,064	2.72	4.98	201,000
1899	253,741,000	410,635	244,838,000	396,624	1,216	3.07	4.97	201,000
1900	269,684,000	448,581	260,164,000	432,453	1,492	3.45	5.73	174,000
1901	293,300,000	485,544	288,723,000	476,655	1,549	3.25	5.37	186,000
1902	301,590,000	518,197	296,687,000	510,437	1,895	3.71	6.39	157,000
1903	357,356,000	566,260	345,200,000	547,431	1,752	3.20	5.08	197,000
1904	351,816,000	593,693	339,165,000	573,373	2,004	3.50	5.91	169,000
1905	392,723,000	626,035	386,379,000	615,628	2,232	3.63	5.78	173,000
1906	414,157,000	640,780	407,835,000	631,086	2,116	3.35	5.19	193,000
1907	480,363,000	680,492	461,406,000	655,418	3,197	4.88	6.93	144,000
1908	415,843,000	690,438	404,933,000	672,794	2,449	3.64	6.05	165,000
1909	460,815,000	666,555	460,761,000	666,523	2,668	4.00	5.79	173,000
1910	501,596,000	725,030	501,596,000	725,030	2,840	3.92	5.66	177,000
1911	496,221,000	728,348	496,221,000	728,348	2,719	3.73	5.48	183,000
1912	550,000,000	750,000	550,000,000	750,000	2,360	3.15	4.29	233,000

[a] The figures for production and number of men employed are from "Mineral Resources of the United States," U. S. Geol. Survey, except for the number of men employed in 1911, which were compiled by the Bureau of Mines.

[b] These figures represent the total production and the total number of employees in the entire coal-mining industry of the United States. The figures for 1912 are subject to slight revision.

[c] These figures represent the production and the number of men employed in those States in which records of fatal accidents are in existence. The figures are directly comparable with the number of men killed as given in the fifth column and are those on which the mortality rates are based. It will be noted that the portion of the industry not represented in the rates from 1896 to 1909 is small and that since 1909 the entire industry is represented.

It will be noted that during the 17 years represented both the death rate per 1,000 employed and per 1,000,000 tons mined reached a maximum in 1907, when four exceptionally disastrous mine explosions, in which 690 men were killed, raised the fatalities to 3,197. From 1896 to 1907 the number of men killed per 1,000 employed gradually increased, with only slight fluctuations. The number killed per 1,000,000 short tons of coal mined also increased, but the rate fluctuated over a greater range. It is interesting to note that during this 12-year period the increase in the death rate was accompanied by an enormous increase in the production of coal. In 1896 the output was 191,986,000 tons and in 1907 it was 480,363,000 tons, an increase of 288,377,000 tons, or over 150 per cent. In 1896 each man employed produced 2.64 tons of coal per day, whereas in 1907 the daily production of each man was 3.06 tons, an increase of 16 per cent. More coal was, therefore, being produced per man, and the increase in individual production was naturally accompanied by greater risk.

The enormous increase in production from 1896 to 1907 called for new mining methods. Electric haulage systems were installed and mining machines came into more general use. For example, in 1896 the tonnage mined by machines was 96,424,932 short tons, whereas in 1907 it was 138,547,823 short tons. With the introduction of

new devices came new dangers, and measures tending to lessen danger did not keep pace with the increased risk. Public sentiment was finally so aroused by the loss of life that in May, 1908, Congress authorized the United States Geological Survey to investigate the causes of mine explosions with a view to increasing safety in mining. This work was taken up under the direction of the present Director of the Bureau of Mines, and such progress made that Congress in July, 1910, created a separate bureau to carry on this work. The investigative and educational work of the Bureau of Mines along these lines is generally known and is set forth in its numerous publications. Since 1908, the year in which the investigations were started, there has been an annual decrease in the number of men killed per 1,000,000 tons of coal mined, and a notable decrease in the death rate. The most marked improvement in conditions was in 1912 when the number of men killed was the least since 1906, the death rate per 1,000 employed was the smallest since 1899, and the death rate per 1,000,000 tons of coal mined was the lowest on record.

These facts offer indisputable evidence that conditions tending toward safety in coal mining are actually improving and that coal is now being mined with less danger to the miner than ever before. The general improvement in 1912 as compared with 1911 is shown by the following facts:

In 1912 the number of men killed in the coal mines of the United States was 359 less than in 1911—2,360 as compared with 2,719—a decrease of 13.2 per cent, and this in spite of the fact that there were more men employed in the mines and more coal mined than in any previous year.

The death rate per 1,000 men employed in 1912 was 3.15, as against 3.73 in the previous year, a decrease of 15.5 per cent.

During 1912 for every 1,000,000 tons of coal mined 4.29 men were killed, as compared with 5.48 men in 1911, a decrease of 21.7 per cent.

There was 233,000 tons of coal mined for each man killed in 1912, as compared with 183,000 tons in 1911, an increase of 50,000 tons, or 27.3 per cent.

It will be noted from the foregoing table that the death rate per 1,000,000 tons of coal mined has decreased annually, that the production per death has increased each year since 1907, and that the death rate per 1,000 men employed has steadily decreased during the last four years.

This general improvement has been brought about by a combination of causes, the principal one of which has been more efficient and effective mine inspection on the part of the State mining departments and State mine inspectors throughout the country, supplemented by greater care on the part of both the operators and the miners. The investigative and educational work of the Bureau of Mines has kept

both the operator and the miner alive to the various dangers connected with coal mining and has shown what precautions should be taken to avoid these dangers. The bureau is therefore gratified with the improvement shown, particularly as the greatest improvement relates to dangers concerning which the bureau has been conducting special investigations, as is shown later. The bureau, however, can not too strongly express its appreciation of the cooperation of the

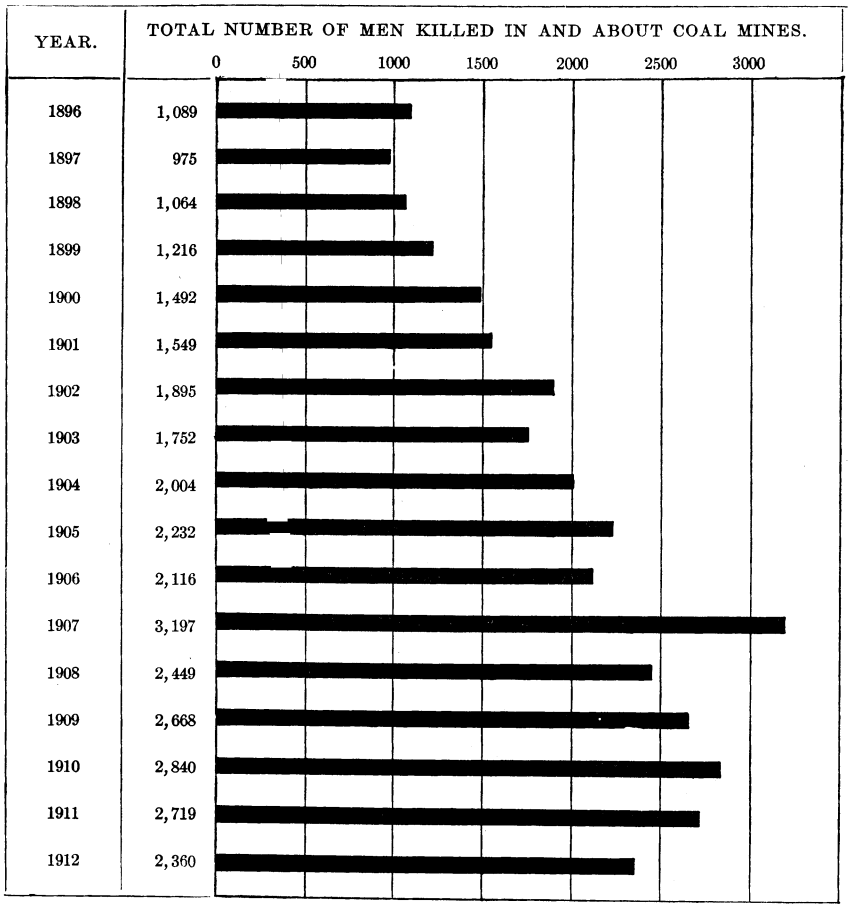


FIGURE 2.—Total number of men killed in and about coal mines in the United States during the years 1896 to 1912.

State mining officials and the operators in the work of making coal mining safer.

Although there has been an annual improvement in mine safety conditions since 1907, and a particularly notable one in 1912, a still greater decrease in the death rate can be effected. Whether or not such an improvement will be made in 1913 depends largely on the care exercised by the operators, superintendents, foremen, and all others in authority, and by the miners as well, to prevent the rise of danger-

ous conditions and to avoid unnecessary risks when such conditions have arisen.

Figure 2 shows the total number of men killed in and about the coal mines of the United States since 1896. It will be noted that the number of fatalities almost steadily increased to a maximum of 3,197 in 1907. Further, it will be seen that during the years 1910 to 1912 the actual number of men killed each year has decreased, although during that time there has been a material increase in the

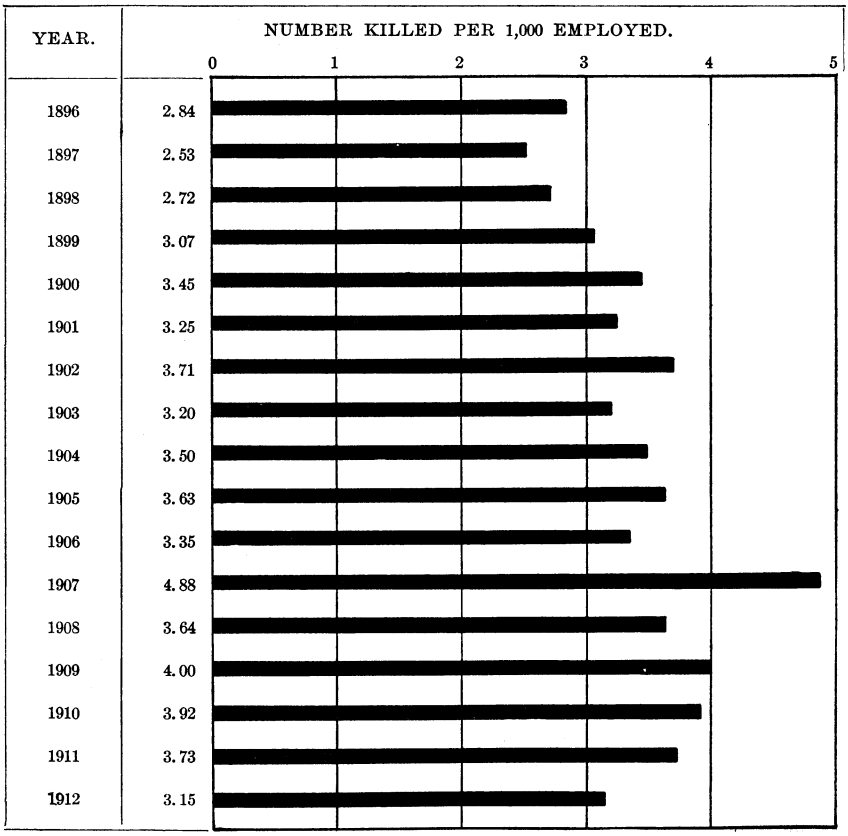


FIGURE 3.—Number of men killed per 1,000 employed in and about coal mines in the United States during the years 1896 to 1912.

number of men employed in and about the mines and in the production of coal, and that in 1912 fewer men were killed than in any year since 1906. The total number of men killed in the 17 years represented by the figure was 33,617, an average of 1,977 per year.

The number of men killed per 1,000 employed in and about the coal mines of the United States from 1896 to 1912 is shown in figure 3. It will be noted that the highest death rate occurred in 1907. Since 1909 there has been an annual improvement, and the death rate for 1912 was the lowest in 13 years.

The actual relative risk of coal mining in the various years can not, of course, be determined without taking into consideration the number of days the mines were operated, or, in other words, the number of days the men were subject to risk. In order to make a true comparison of the risk it is necessary to calculate the death rates per 1,000 employed on the basis of a uniform period of exposure to danger. For this purpose a year of 300 working days has been selected, as it approximates the average time worked in the coal mines of the principal foreign coal-producing countries; moreover, the adoption of this standard will assist later in making comparisons with the death rates abroad. On account of variations in the length of the working day in various coal mines and coal-mining districts, it would be desirable to calculate the death rate per 1,000 employed on the

YEAR.	NUMBER OF DAYS ACTUALLY WORKED.	NUMBER KILLED PER 1,000 EMPLOYED.	NUMBER KILLED PER 1,000 EMPLOYED, CALCULATED ON THE BASIS OF A YEAR OF 300 WORKING DAYS.
1896	185	2.84	4.61
1897	179	2.53	4.23
1898	190	2.72	4.29
1899	214	3.07	4.30
1900	212	3.45	4.88
1901	216	3.25	4.51
1902	197	3.71	5.65
1903	220	3.20	4.36
1904	202	3.50	5.19
1905	212	3.63	5.13
1906	209	3.35	4.81
1907	231	4.88	6.33
1908	195	3.64	5.60
1909	[a] 225	4.00	5.34
1910	220	3.92	5.34
1911	220	3.73	5.09

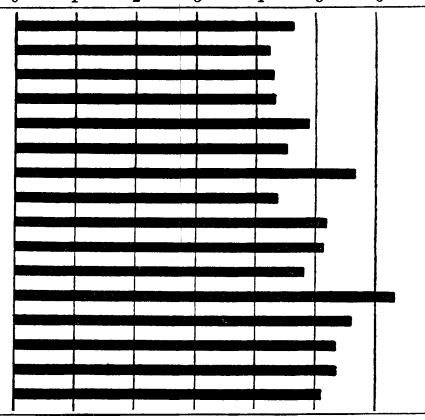


FIGURE 4.—Number of men killed per 1,000 employed, calculated on the basis of a year of 300 working days.

basis of the number of hours the mines were operated, but this is impossible as there are no official records from which these data for the country as a whole may be determined.

Figure 4 shows the number of days actually worked in the coal mines of the United States each year from 1896 to 1911, inclusive, the actual number killed per 1,000 employed, and the number killed per 1,000 employed, calculated on a basis of a uniform year of 300 working days. This figure brings out more clearly the increase in the death rates from 1896 to 1907 and the decrease since that date, as shown by the rates indicated in figures 1 and 3. It is worthy of note that the last-named figures show a lower death rate per 1,000 employed in 1908 than in 1909, 1910, or 1911, whereas, as indicated in figure 4, in which consideration is taken of the number of days the

[a] Estimated; no official figures available.

mines were operated, the death rate in 1908 was higher than in either of the following three years, so that the real dimunition of the risk in coal mining has been more nearly constant since 1907 than is represented by figures 1 and 3.

No official figures of the average number of days the coal mines were operated in 1912 are yet available, but it is safe to assume that the bituminous coal mines were operated longer than in 1911, and the anthracite mines perhaps not quite as long, so that the average

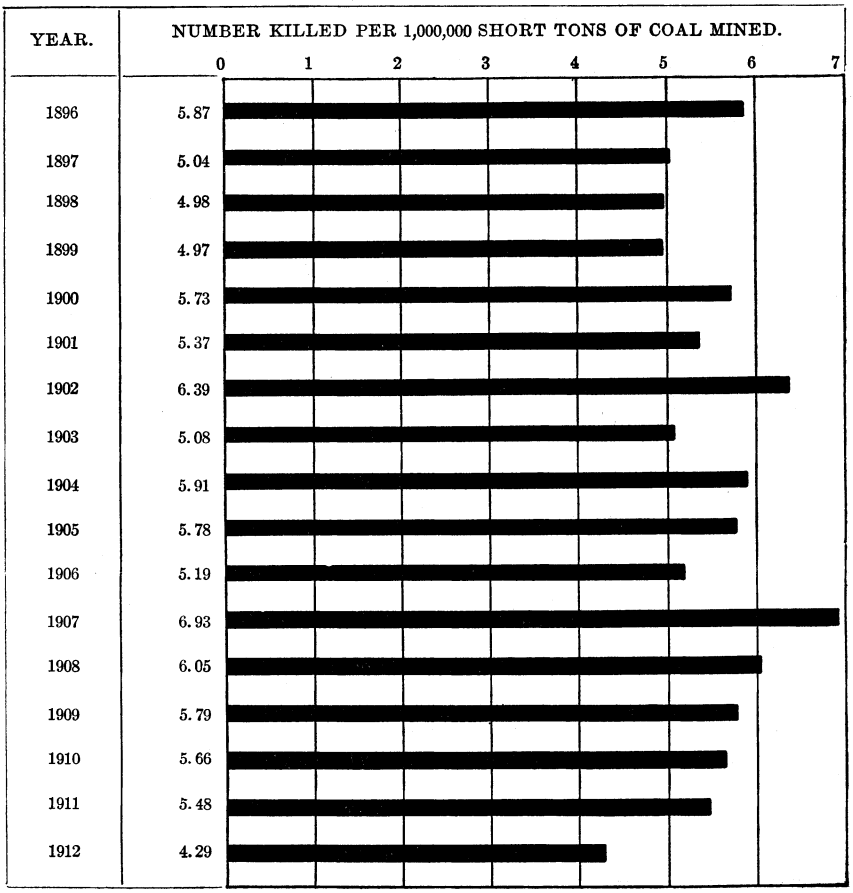


FIGURE 5.—Number of men killed per 1,000,000 short tons of coal mined during the years 1896 to 1912.

number of days operated in 1912 will not be far from that for 1911. Assuming, however, that the average length of time the mines were operated in 1912 was even as much as 230 days or 10 days more than in 1911, the death rate would still show a notable improvement over that for 1911, when calculated on a basis of 300 working days.

Figures 5 and 6 show the number of men killed per 1,000,000 short tons of coal mined in the United States since 1896, and the number of tons produced for each life lost.

As the production bears a direct relation to the total number of days the mines were operated, and therefore to the length of time the men were exposed to risk, and also to the speed of working, or daily production of coal per man, a comparison of the relative risk of mining on the basis of the production is the fairest comparison that can be made. There has been an annual improvement in the death rate per 1,000,000 tons of coal mined since 1907, and in 1912 the rate was considerably lower than that of any previous year for which records

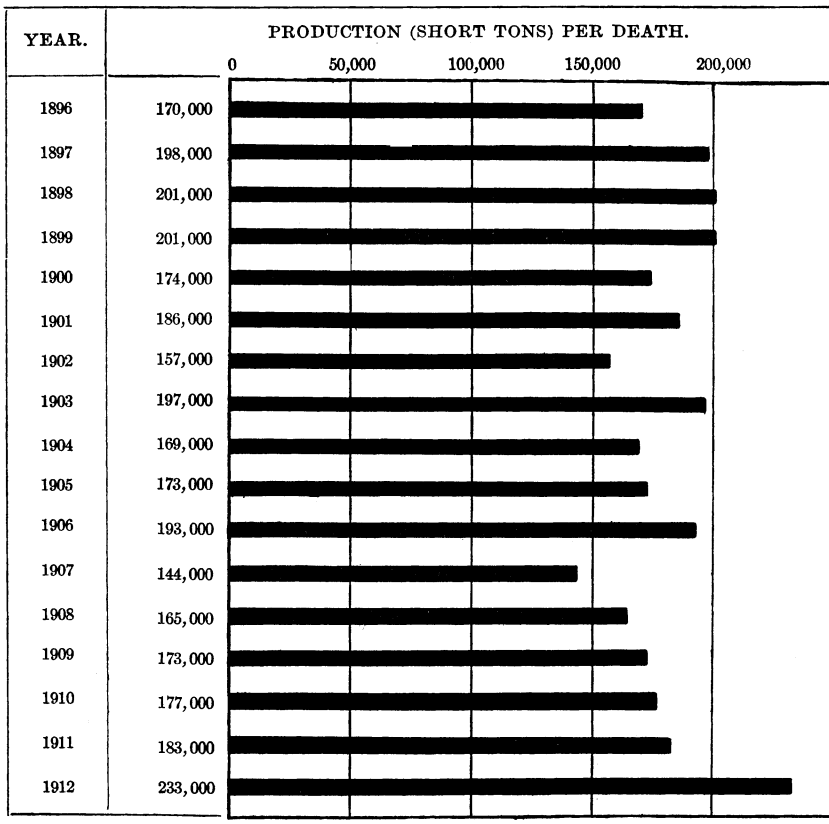


FIGURE 6.—Production of coal (short tons) per death during the years 1896 to 1912.

are available. There has, of course, been a corresponding increase in the production of coal per death, and the total tonnage mined per life lost was 32,000 tons larger than the best previous record and 50,000 tons more than in 1911.

Detailed statistics, by States, showing the production, the number of men employed, the number of men killed in the coal mines, and the corresponding death rates during the 16 years 1896 to 1911, are given in Table 2. It will be noted that the data in the table for 1911 are given in greater detail than for previous years, as, through

the collection of its own statistics relative to the number of men employed, the bureau was able to determine the number of men working underground and the number employed on the surface. Consequently, presentation of the death rates underground and on the surface for that year has been possible. The tables mentioned are presented below.

TABLE 2.—*Production, number of men employed, and number of men killed in and about the coal mines in the United States in the calendar years 1896–1911.*

1896.

State.	Production (short tons).	Number employed.	Number killed.			Production per death (short tons).
			Total.	Per 1,000 employed.	Per 1,000,000 short tons mined.	
Alabama	5,748,697	9,894	28	2.83	4.87	205,000
Arkansas	675,374	1,507	1	.66	1.48	675,000
Colorado	3,112,400	6,704	68	10.14	21.85	46,000
Illinois	19,786,626	39,560	70	1.77	3.54	283,000
Indiana	3,905,779	8,806	28	3.18	7.17	139,000
Iowa	3,954,028	9,672	18	1.86	4.55	220,000
Kansas	2,884,801	7,127	12	1.68	4.16	240,000
Kentucky	3,333,478	7,549	6	.79	1.80	556,000
Maryland	4,143,936	4,039	6	1.49	1.45	691,000
Missouri	2,331,542	5,982	8	1.34	3.43	291,000
New Mexico	622,626	1,569	7	4.46	11.24	89,000
Ohio	12,875,202	25,500	43	1.69	3.34	299,000
Oklahoma	1,366,646	3,549	15	4.23	10.98	91,000
Pennsylvania (anthracite)	54,346,081	148,991	502	3.37	9.24	108,000
Pennsylvania (bituminous)	49,557,453	72,625	180	2.48	3.63	275,000
Tennessee	2,663,106	6,531	22	3.37	8.26	121,000
Washington	1,195,504	2,622	8	3.05	6.69	149,000
West Virginia	12,876,296	19,078	67	3.51	5.20	192,000
Total	[a] 185,379,575	[a] 383,258	1,089			
Average				2.84	5.87	170,000

1897.

Alabama	5,893,770	10,597	39	3.68	6.62	151,000
Arkansas	856,190	1,990	3	1.51	3.50	285,000
Colorado	3,361,703	5,852	38	6.49	11.30	88,000
Illinois	20,072,758	33,788	74	2.19	3.69	271,000
Indiana	4,151,169	8,886	16	1.80	3.85	259,000
Iowa	4,611,865	10,703	23	2.15	4.99	201,000
Kansas	3,054,012	6,639	7	1.05	2.29	436,000
Kentucky	3,602,097	7,983	12	1.50	3.33	300,000
Maryland	4,442,128	4,719	5	1.06	1.13	888,000
Missouri	2,665,626	6,414	12	1.87	4.50	222,000
Montana	1,647,882	2,337	11	4.71	6.68	150,000
New Mexico	716,981	1,659	7	4.22	9.76	102,000
Ohio	12,196,942	26,410	39	1.48	3.20	313,000
Oklahoma	1,336,380	3,168	27	8.52	20.20	49,000
Pennsylvania (anthracite)	52,611,680	149,884	423	2.82	8.04	124,000
Pennsylvania (bituminous)	54,417,974	77,272	150	1.94	2.76	363,000
Tennessee	2,888,849	6,337	10	1.58	3.46	289,000
Utah	521,560	704	2	2.84	3.83	261,000
West Virginia	14,248,159	20,504	77	3.76	5.40	185,000
Total	[b] 193,297,725	[b] 385,846	975			
Average				2.53	5.04	198,000

[a] Selected from Mineral Resources U. S., 1896–1911: U. S. Geol. Survey.
[b] Selected from Mineral Resources U. S., 1897–1911: U. S. Geol. Survey.

TABLE 2.—*Production, number of men employed, and number of men killed in and about the coal mines in the United States in the calendar years 1896–1911*—Continued.

1898.

State.	Production (short tons).	Number employed.	Number killed.			Production per death (short tons).
			Total.	Per 1,000 employed.	Per 1,000,000 short tons mined.	
Alabama	6,535,283	10,733	45	4.19	6.89	145,000
Arkansas	1,205,479	2,555	5	1.96	4.15	241,000
Colorado	4,076,347	6,440	23	3.57	5.64	177,000
Illinois	18,599,299	35,026	89	2.54	4.79	209,000
Indiana	4,920,743	8,971	21	2.34	4.27	234,000
Iowa	4,618,842	10,262	22	2.14	4.76	210,000
Kansas	3,406,555	7,197	17	2.36	4.99	200,000
Kentucky	3,887,908	7,614	6	7.88	1.54	648,000
Maryland	4,674,884	4,818	4	.83	.86	1,169,000
Missouri	2,688,321	6,542	10	1.53	3.72	269,000
Montana	1,479,803	2,359	7	2.97	4.73	211,000
New Mexico	992,288	1,873	8	4.27	8.06	124,000
Ohio	14,516,867	26,986	50	1.85	3.44	290,000
Oklahoma	1,381,466	3,216	23	7.15	16.65	60,000
Pennsylvania (anthracite)	53,382,644	145,504	411	2.82	7.70	130,000
Pennsylvania (bituminous)	65,165,133	79,611	200	2.51	3.07	326,000
Tennessee	3,022,896	6,643	19	2.86	6.29	159,000
Utah	593,709	739	3	4.06	5.05	198,000
Washington	1,884,571	3,145	11	3.50	5.84	171,000
West Virginia	16,700,999	21,607	90	4.17	5.39	186,000
Total	[a] 213,734,037	[a] 391,841	1,064			
Average				2.72	4.98	201,000

1899.

Alabama	7,593,416	13,481	40	2.97	5.27	190,000
Colorado	4,776,224	7,166	40	5.58	8.37	119,000
Illinois	24,439,019	36,756	73	1.99	2.99	335,000
Indiana	6,006,523	9,712	17	1.75	2.83	353,000
Iowa	5,177,479	10,971	25	2.28	4.83	207,000
Kansas	3,852,267	8,000	16	2.00	4.15	241,000
Kentucky	4,607,255	7,461	7	.94	1.52	658,000
Maryland	4,807,396	4,624	5	1.08	1.04	961,000
Missouri	3,025,814	7,136	11	1.54	3.64	275,000
Montana	1,496,451	2,378	1	.42	.67	1,496,000
New Mexico	1,050,714	1,750	18	10.29	17.13	58,000
Ohio	16,500,270	26,038	56	2.15	3.39	295,000
Oklahoma	1,537,427	4,084	27	6.61	17.56	57,000
Pennsylvania (anthracite)	60,418,005	139,608	461	3.30	7.63	131,000
Pennsylvania (bituminous)	74,150,175	82,812	258	3.12	3.48	287,000
Tennessee	3,330,659	6,949	20	2.88	6.00	167,000
Utah	786,049	743	0	0	0	
Washington	2,029,881	3,330	45	13.51	22.17	45,000
West Virginia	19,252,995	23,625	96	4.06	4.99	201,000
Total	[b] 244,838,019	[b] 396,624	1,216			
Average				3.07	4.97	201,000

[a] Selected from Mineral Resources U. S., 1898–1911: U. S. Geol. Survey.
[b] Selected from Mineral Resources U. S., 1899–1911: U. S. Geol. Survey.

TABLE 2.—*Production, number of men employed, and number of men killed in and about the coal mines in the United States in the calendar years 1896–1911*—Continued.

1900.

State.	Production (short tons).	Number employed.	Number killed.			Production per death (short tons).
			Total.	Per 1,000 employed.	Per 1,000,000 short tons mined.	
Alabama	8,394,275	13,967	37	2.65	4.41	227,000
Colorado	5,244,364	7,459	31	4.16	5.91	169,000
Illinois	25,767,981	39,101	102	2.61	3.96	253,000
Indiana	6,484,086	11,720	19	1.62	2.93	341,000
Iowa	5,202,939	11,608	29	2.50	5.57	179,000
Kansas	4,467,870	8,459	22	2.60	4.92	203,000
Kentucky	5,328,964	9,680	17	1.76	3.19	313,000
Maryland	4,024,688	5,319	[a]7	1.32	1.74	575,000
Michigan	849,475	1,709	10	5.85	11.77	85,000
Missouri	3,540,103	8,180	19	2.32	5.37	186,000
Montana	1,661,775	2,376	7	2.95	4.21	237,000
New Mexico	1,299,299	2,037	9	4.42	6.93	144,000
Ohio	18,988,150	27,628	71	2.57	3.74	267,000
Oklahoma	1,922,298	4,525	35	7.73	18.21	55,000
Pennsylvania (anthracite)	57,367,915	144,206	411	2.85	7.16	140,000
Pennsylvania (bituminous)	79,842,326	92,692	265	2.86	3.32	301,000
Tennessee	3,509,562	7,646	10	1.31	2.85	351,000
Utah	1,147,027	1,308	209	159.79	182.21	5,000
Washington	2,474,093	3,670	32	8.72	12.93	77,000
West Virginia	22,647,207	29,163	150	5.14	6.62	151,000
Total	[a]260,164,397	[a]432,453	1,492	.....	.....	.....
Average	.....	.....	.....	3.45	5.73	174,000

1901.

Alabama	9,099,052	17,370	41	2.36	4.51	222,000
Arkansas	1,816,136	3,144	18	5.73	9.91	101,000
Colorado	5,700,015	8,870	55	6.20	9.65	104,000
Illinois	27,331,552	41,880	106	2.53	3.88	258,000
Indiana	6,918,225	12,968	24	1.85	3.47	288,000
Iowa	5,617,499	12,653	29	2.29	5.16	194,000
Kansas	4,900,528	9,928	11	1.11	2.24	446,000
Kentucky	5,469,986	10,307	21	2.04	3.84	260,000
Maryland	5,113,127	5,333	12	2.25	2.35	426,000
Michigan	1,241,241	2,276	6	2.64	4.83	207,000
Missouri	3,802,088	9,871	16	1.62	4.21	238,000
Montana	1,396,081	2,158	7	3.24	5.01	199,000
New Mexico	1,086,546	2,478	12	4.84	11.04	91,000
Ohio	20,943,807	32,111	67	2.09	3.20	313,000
Oklahoma	2,421,781	6,706	57	8.50	23.54	42,000
Pennsylvania (anthracite)	67,471,667	145,309	513	3.53	7.60	132,000
Pennsylvania (bituminous)	82,305,946	101,904	301	2.95	3.66	273,000
Tennessee	3,633,290	9,046	44	4.86	12.11	83,000
Utah	1,322,614	1,712	8	4.67	6.05	165,000
Washington	2,578,217	4,545	27	5.94	10.47	95,000
West Virginia	24,068,402	30,935	133	4.30	5.53	181,000
Wyoming	4,485,374	5,151	41	7.96	9.14	109,000
Total	[b]288,723,174	[b]476,655	1,549	.....	.....	.....
Average	.....	.....	.....	3.25	5.37	186,000

[a] Selected from Mineral Resources U. S., 1900–1911: U. S. Geol. Survey.
[b] Selected from Mineral Resources U. S., 1901–1911: U. S. Geol. Survey.

TABLE 2.—*Production, number of men employed, and number of men killed in and about the coal mines in the United States in the calendar years 1896–1911*—Continued.

1902.

State.	Production (short tons).	Number employed.	Number killed.			Production per death (short tons).
			Total.	Per 1,000 employed.	Per 1,000,000 short tons mined.	
Alabama	10,354,570	16,439	50	3.04	4.83	207,000
Arkansas	1,943,932	3,595	13	3.62	6.69	150,000
Colorado	7,401,343	8,956	72	8.04	9.73	103,000
Illinois	32,939,373	47,411	107	2.26	3.25	308,000
Indiana	9,446,424	15,457	24	1.55	2.54	394,000
Iowa	5,904,766	12,434	49	3.94	8.30	121,000
Kansas	5,266,065	9,461	29	3.07	5.51	182,000
Kentucky	6,766,984	13,727	19	1.38	2.81	356,000
Maryland	5,271,609	5,827	11	1.89	2.09	479,000
Michigan	964,718	2,344	8	3.41	8.29	121,000
Missouri	3,890,154	9,742	10	1.03	2.57	389,000
Montana	1,560,823	1,938	12	6.19	7.69	130,000
New Mexico	1,048,763	1,849	14	7.57	13.35	75,000
Ohio	23,519,894	38,965	87	2.23	3.70	270,000
Oklahoma	2,820,666	5,574	42	7.53	14.89	67,000
Pennsylvania (anthracite)	41,373,595	148,141	300	2.03	7.25	138,000
Pennsylvania (bituminous)	98,574,367	112,630	456	4.05	4.63	216,000
Tennessee	4,382,968	8,750	226	25.83	51.56	19,000
Utah	1,574,521	1,826	8	4.38	5.08	197,000
Washington	2,681,214	4,404	34	7.72	12.68	79,000
West Virginia	24,570,826	35,500	134	3.77	5.45	183,000
Wyoming	4,429,491	5,250	190	36.19	42.89	23,000
Total	[a] 296,687,066	[a] 510,220	1,895	.....	.....	.....
Average	.....	.....	.....	3.71	6.39	157,000

1903.

Alabama	11,654,324	21,438	57	2.66	4.89	204,000
Colorado	7,423,602	9,229	44	4.77	5.93	169,000
Illinois	36,957,104	50,596	158	3.12	4.28	234,000
Indiana	10,794,692	17,017	52	3.06	4.82	208,000
Iowa	6,419,811	14,162	27	1.91	4.21	238,000
Kansas	5,839,976	10,924	33	3.02	5.65	177,000
Kentucky	7,538,032	14,354	27	1.88	3.58	279,000
Maryland	4,846,165	5,859	12	2.05	2.48	404,000
Michigan	1,367,619	2,768	8	2.89	5.85	171,000
Missouri	4,238,586	9,544	17	1.78	4.01	249,000
Montana	1,488,810	2,155	5	2.32	3.36	298,000
New Mexico	1,541,781	1,789	22	12.30	14.27	70,000
Ohio	24,838,103	41,936	124	2.96	4.99	200,000
Oklahoma	3,517,388	7,704	41	5.32	11.66	86,000
Pennsylvania (anthracite)	74,607,068	150,483	518	3.44	6.94	144,000
Pennsylavnia (bituminous)	103,117,178	129,265	402	3.11	3.90	257,000
Tennessee	4,798,004	9,961	26	2.61	5.42	185,000
Utah	1,681,409	1,925	7	3.64	4.16	240,000
Washington	3,193,273	4,768	25	5.24	7.83	128,000
West Virginia	29,337,241	41,554	147	3.54	5.01	200,000
Total	[b] 345,200,166	[b] 547,431	1,752	.....	.....	.....
Average	.....	.....	.....	3.20	5.08	197,000

[a] Selected from Mineral Resources U. S., 1902–1911: U. S. Geol. Survey.
[b] Selected from Mineral Resources U. S., 1903–1911; U. S. Geol. Survey.

TABLE 2.—*Production, number of men employed, and number of men killed in and about the coal mines in the United States in the calendar years 1896–1911*—Continued

1904.

State.	Production (short tons).	Number employed.	Number killed.			Production per death (short tons).
			Total.	Per 1,000 employed.	Per 1,000,000 short tons mined.	
Alabama	11,262,046	17,811	83	4.66	7.37	136,000
Colorado	6,658,355	8,123	95	11.70	14.27	70,000
Illinois	36,475,060	54,685	173	3.16	4.74	211,000
Indiana	10,842,189	19,587	34	1.74	3.14	319,000
Iowa	6,519,933	15,629	25	1.60	3.83	261,000
Kansas	6,333,307	12,198	32	2.62	5.05	198,000
Kentucky	7,576,482	14,235	20	1.40	2.64	379,000
Maryland	4,813,622	5,671	10	1.76	2.08	481,000
Michigan	1,342,840	3,549	8	2.25	5.96	168,000
Missouri	4,168,308	10,137	11	1.09	2.64	379,000
Montana	1,358,919	2,505	9	3.59	6.62	151,000
New Mexico	1,452,325	1,849	8	4.33	5.51	182,000
Ohio	24,400,220	43,634	118	2.70	4.84	207,000
Oklahoma	3,046,539	8,487	29	3.42	9.52	105,000
Pennsylvania (anthracite)	73,156,709	155,861	595	3.82	8.13	123,000
Pennsylvania (bituminous)	97,938,287	135,100	536	3.97	5.47	183,000
Tennessee	4,782,211	10,416	28	2.69	5.86	171,000
Utah	1,493,027	1,374	10	7.28	6.70	149,000
Washington	3,137,681	5,287	31	5.86	9.88	101,000
West Virginia	32,406,752	47,235	149	3.15	4.60	217,000
Total	[a] 339,164,812	[a] 573,373	2,004	.....	.....	.....
Average	.....	.....	.....	3.50	5.91	169,000

1905.

Alabama	11,866,069	19,595	187	9.54	15.76	63,000
Arkansas	1,934,673	4,192	8	1.91	4.14	242,000
Colorado	8,826,429	11,020	65	5.90	7.36	136,000
Illinois	38,434,363	58,053	203	3.50	5.28	189,000
Indiana	11,895,252	25,323	47	1.86	3.95	253,000
Iowa	6,798,609	15,113	37	2.45	5.44	184,000
Kansas	6,423,979	11,926	41	3.44	6.38	157,000
Kentucky	8,432,523	14,685	31	2.11	3.68	272,000
Maryland	5,108,539	5,948	15	2.52	2.94	341,000
Michigan	1,473,211	3,696	9	2.44	6.11	164,000
Missouri	3,983,378	8,962	11	1.23	2.76	362,000
Montana	1,643,832	2,181	8	3.67	4.87	205,000
New Mexico	1,649,933	2,108	7	3.32	4.24	236,000
Ohio	25,552,950	43,399	127	2.93	4.97	201,000
Oklahoma	2,924,427	7,712	41	5.32	14.02	71,000
Pennsylvania (anthracite)	77,659,850	165,406	644	3.89	8.29	121,000
Pennsylvania (bituminous)	118,413,637	143,629	479	3.33	4.05	247,000
Tennessee	5,766,690	11,928	29	2.43	5.03	199,000
Utah	1,332,372	1,361	7	5.14	5.25	190,000
Washington	2,864,926	4,765	12	2.52	4.19	239,000
West Virginia	37,791,580	48,389	212	4.38	5.61	178,000
Wyoming	5,602,021	5,977	12	2.01	2.14	467,000
Total	[b] 386,379,243	[b] 615,368	2,232	.....	.....	.....
Average	.....	.....	.....	3.63	5.78	173,000

[a] Selected from Mineral Resources U. S., 1904–1911: U. S. Geol. Survey.
[b] Selected from Mineral Resources U. S., 1905–1911: U. S. Geol. Survey.

TABLE 2.—*Production, number of men employed, and number of men killed in and about the coal mines in the United States in the calendar years 1896–1911*—Continued.

1906.

State.	Production (short tons).	Number employed.	Number killed.			Production per death (short tons).
			Total.	Per 1,000 employed.	Per 1,000,000 short tons mined.	
Alabama	13,107,963	20,555	96	4.67	7.32	137,000
Arkansas	1,864,268	4,298	13	3.02	6.97	143,000
Colorado	10,111,218	11,368	90	7.92	8.90	112,000
Illinois	41,480,104	61,988	161	2.60	3.88	258,000
Indiana	12,092,560	20,970	31	1.48	2.56	390,000
Iowa	7,266,224	15,260	29	1.90	3.99	251,000
Kansas	6,024,775	14,355	39	2.72	6.47	154,000
Kentucky	9,653,647	15,272	39	2.55	4.04	248,000
Maryland	5,435,453	6,438	6	.93	1.10	906,000
Michigan	1,346,338	3,971	5	1.26	3.72	269,000
Missouri	3,758,008	9,557	16	1.67	4.26	235,000
Montana	1,829,921	2,394	13	5.43	7.10	141,000
New Mexico	1,964,713	2,070	14	6.76	7.13	140,000
Ohio	27,731,640	45,438	132	2.91	4.76	210,000
Oklahoma	2,860,200	8,251	44	5.33	15.38	65,000
Pennsylvania (anthracite)	71,282,411	162,355	557	3.43	7.81	128,000
Pennsylvania (bituminous)	129,293,206	152,099	477	3.14	3.69	271,000
Tennessee	6,259,275	11,452	32	2.79	5.11	196,000
Utah	1,772,551	1,572	8	5.09	4.51	222,000
Washington	3,276,184	4,529	22	4.86	6.72	149,000
West Virginia	43,290,350	50,960	277	5.44	6.40	156,000
Wyoming	6,133,994	5,934	15	2.53	2.45	409,000
Total	[a] 407,835,003	[a] 631,086	2,116	.....	.....	.....
Average	.....	.....	.....	3.35	5.19	193,000

1907.

Alabama	14,250,454	21,388	154	7.20	10.81	93,000
Arkansas	2,670,438	5,085	13	2.56	4.87	205,000
Colorado	10,790,236	14,223	107	7.52	9.92	101,000
Illinois	51,317,146	65,581	192	2.93	3.74	267,000
Indiana	13,985,713	21,022	53	2.52	3.79	264,000
Iowa	7,574,322	15,585	40	2.57	5.28	189,000
Kansas	7,322,449	12,439	38	3.06	5.19	193,000
Kentucky	10,753,124	16,971	32	1.89	2.98	336,000
Michigan	2,035,858	3,982	7	1.76	3.44	291,000
Missouri	3,997,936	8,448	8	.95	2.00	500,000
Montana	2,016,857	2,735	13	4.75	6.45	155,000
New Mexico	2,628,959	2,970	31	10.44	11.79	85,000
Ohio	32,142,419	46,833	154	3.29	4.79	209,000
Oklahoma	3,642,658	8,398	32	3.81	8.78	114,000
Pennsylvania (anthracite)	85,604,312	167,234	708	4.23	8.27	121,000
Pennsylvania (bituminous)	150,143,177	163,295	806	4.94	5.37	186,000
Tennessee	6,810,243	12,052	30	2.49	4.41	227,000
Utah	1,947,607	2,203	8	3.63	4.11	243,000
Washington	3,680,532	5,945	37	6.22	10.05	99,000
West Virginia	48,091,583	59,029	734	12.43	15.26	66,000
Total	[b] 461,406,023	[b] 655,418	3,197	.....	.....	.....
Average	.....	.....	.....	4.88	6.93	144,000

[a] Selected from Mineral Resources U. S., 1906–1911: U. S. Geol. Survey.
[b] Selected from Mineral Resources U. S., 1907–1911: U. S. Geol. Survey.

TABLE 2.—*Production, number of men employed, and number of men killed in and about the coal mines in the United States in the calendar years 1896–1911*—Continued.

1908.

State.	Production (short tons).	Number employed.	Number killed.			Production per death (short tons).
			Total.	Per 1,000 employed.	Per 1,000,000 short tons mined.	
Alabama	11,604,593	19,197	108	5.63	9.31	107,000
Arkansas	2,078,357	5,337	14	2.62	6.74	148,000
Colorado	9,634,973	14,523	63	4.34	6.54	153,000
Illinois	47,659,690	68,035	172	2.53	3.61	277,000
Indiana	12,314,890	18,380	45	2.45	3.65	274,000
Iowa	7,161,310	16,021	31	1.94	4.33	231,000
Kansas	6,245,508	13,916	38	2.73	6.08	164,000
Kentucky	10,246,553	16,996	40	2.35	3.90	256,000
Michigan	1,835,019	4,247	6	1.41	3.27	306,000
Missouri	3,317,315	8,988	10	1.11	3.01	332,000
Montana	1,920,190	3,146	21	6.68	10.94	91,000
New Mexico	2,467,937	3,448	24	6.96	9.72	103,000
North Dakota	320,742	631	4	6.34	12.47	80,000
Ohio	26,270,639	47,407	115	2.43	4.38	228,000
Oklahoma	2,948,116	8,651	51	5.90	17.30	58,000
Pennsylvania (anthracite)	83,268,754	174,174	678	3.89	8.14	123,000
Pennsylvania (bituminous)	117,179,527	165,961	572	3.45	4.88	205,000
Tennessee	6,199,171	11,812	34	2.88	5.48	182,000
Utah	1,846,792	2,664	8	3.00	4.33	231,000
Washington	3,024,943	5,484	25	4.56	8.26	121,000
West Virginia	41,897,843	56,861	309	5.43	7.38	136,000
Wyoming	5,489,902	6,915	81	11.71	14.75	68,000
Total	[a] 404,932,764	[a] 672,794	2,449	.....	.....	.....
Average	.....	.....	.....	3.64	6.05	165,000

1909.

Alabama	13,703,450	17,760	129	7.26	9.41	106,000
Arkansas	2,377,157	5,266	15	2.85	6.31	158,000
Colorado	10,716,936	11,472	97	8.46	9.05	110,000
Georgia	211,196	460	2	4.35	9.47	106,000
Illinois	50,904,990	69,425	458	6.60	9.00	111,000
Indiana	14,834,259	20,937	50	2.39	3.37	297,000
Iowa	7,757,762	17,286	39	2.26	5.03	199,000
Kansas	6,986,478	12,359	32	2.59	4.58	218,000
Kentucky	10,697,384	16,903	34	2.01	3.18	315,000
Maryland	4,023,241	8,004	20	2.50	4.97	201,000
Michigan	1,784,692	3,496	9	2.57	5.04	198,000
Missouri	3,756,530	9,188	21	2.29	5.59	179,000
Montana	2,553,940	4,535	11	2.43	4.31	232,000
New Mexico	2,801,128	3,317	14	4.22	5.00	200,000
North Dakota	422,047	972	0	0	0	.....
Ohio	27,939,641	38,114	112	2.94	4.01	249,000
Oklahoma	3,119,377	8,689	67	7.71	21.48	47,000
Oregon	87,276	235	1	4.26	11.46	87,000
Pennsylvania (anthracite)	81,070,359	166,801	567	3.40	6.99	143,000
Pennsylvania (bituminous)	137,966,791	159,321	506	3.18	3.67	273,000
Tennessee	6,358,645	10,031	29	2.89	4.56	219,000
Texas	1,824,440	4,196	4	.95	2.19	456,000
Utah	2,266,899	3,014	15	4.98	6.62	151,000
Virginia	4,752,217	6,191	31	5.01	6.52	153,000
Washington	3,602,263	5,992	39	6.51	10.83	92,000
West Virginia	51,849,220	55,433	336	6.06	6.48	154,000
Wyoming	6,393,109	7,123	30	4.21	4.69	213,000
Total	[b] 460,761,427	[b] 666,520	2,668	.....	.....	.....
Average	.....	.....	.....	4.00	5.79	173,000

[a] Selected from Mineral Resources U. S., 1908–1911: U. S. Geol. Survey.
[b] Selected from Mineral Resources U. S., 1909–1911: U. S. Geol. Survey.

TABLE 2.—*Production, number of men employed, and number of men killed in and about the coal mines in the United States in the calendar years 1896–1911*—Continued.

1910.

State.	Production (short tons).	Number employed.	Number killed.			Production per death (short tons).
			Total.	Per 1,000 employed.	Per 1,000,000 short tons mined.	
Alabama	16,111,462	22,230	238	10.71	14.77	68,000
Arkansas	1,905,958	5,568	14	2.51	7.35	136,000
California and Alaska	12,164	19	0	0	0	.....
Colorado	11,973,736	15,864	323	20.36	26.98	37,000
Georgia	177,245	386	0	0	0	.....
Idaho	4,448	14	0	0	0	.....
Illinois	45,900,246	72,645	143	1.97	3.12	321,000
Indiana	18,389,815	21,878	51	2.33	2.77	361,000
Iowa	7,928,120	16,666	33	1.98	4.16	240,000
Kansas	4,921,451	12,870	17	1.32	3.45	289,000
Kentucky	14,623,319	20,316	86	4.23	5.88	170,000
Maryland	5,217,125	5,809	17	2.93	3.26	307,000
Michigan	1,534,967	3,575	6	1.68	3.91	256,000
Missouri	2,982,433	9,691	14	1.44	4.69	213,000
Montana	2,920,970	3,837	12	3.13	4.11	243,000
New Mexico	3,508,321	3,585	16	4.46	4.56	219,000
North Dakota	399,041	534	2	3.75	5.01	200,000
Ohio	34,209,668	46,641	161	3.45	4.71	212,000
Oklahoma	2,646,226	8,657	40	4.62	15.12	66,000
Oregon	67,533	153	0	0	0	.....
Pennsylvania (anthracite)	84,485,236	169,497	601	3.55	7.11	141,000
Pennsylvania (bituminous)	150,521,526	175,403	539	3.07	3.58	279,000
Tennessee	7,121,380	11,930	38	3.19	5.34	187,000
Texas	1,892,176	4,197	7	1.67	3.70	270,000
Utah	2,517,809	3,053	15	4.91	5.96	168,000
Virginia	6,507,997	7,264	57	7.85	8.76	114,000
Washington	3,911,899	6,314	43	6.81	10.99	91,000
West Virginia	61,671,019	68,663	329	4.79	5.33	187,000
Wyoming	7,533,088	7,771	38	4.89	5.04	198,000
Total	[a] 501,596,378	[a] 725,030	2,840	.....	.....	.....
Average	.....	.....	.....	3.92	5.66	177,000

[a] Selected from Mineral Resources U. S., 1910–1911: U. S. Geol. Survey.

TABLE 2.—*Production, number of men employed, and number of men killed in and about the coal mines in the United States, etc.*—Continued.

1911.

State.	Production (short tons).[a]	Number employed.			Number killed.			Number killed per 1,000 employed.			Number killed per million short tons mined.		Production per death (short tons).	
		Underground.	Surface.	Total.	Underground.	Surface.	Total.	Underground.	Surface.	Total.	Underground.	Total (underground and surface).	Underground.	Total (underground and surface).
Alabama	15,021,421	18,592	3,411	22,003	205	4	209	11.03	1.17	9.50	13.65	13.91	73,000	72,000
Arkansas	2,106,789	4,498	840	5,338	12	0	12	2.67	0	2.25	5.70	5.70	176,000	176,000
California and Alaska	11,647	29	31	60	0	0	0	0	0	0	0	0	.....	.....
Colorado	10,157,383	12,240	2,133	14,373	86	5	91	7.03	2.34	6.33	8.47	8.96	118,000	112,000
Georgia	165,330	420	90	510	0	0	0	0	0	0	0	0	.....	.....
Idaho	1,821	6	3	9	0	0	0	0	0	0	0	0	.....	.....
Illinois	53,679,118	68,033	7,623	75,656	165	7	172	2.43	.92	2.27	3.07	3.20	325,000	312,000
Indiana	14,201,355	18,352	2,639	20,991	43	3	46	2.34	1.14	2.19	3.03	3.24	330,000	309,000
Iowa	7,331,648	14,787	2,065	16,852	40	0	40	2.71	0	2.37	5.46	5.46	183,000	183,000
Kansas	6,254,228	10,592	1,231	11,823	41	1	42	3.87	.81	3.55	6.56	6.72	153,000	149,000
Kentucky	13,706,839	19,592	4,532	24,124	41	4	45	2.09	.88	1.87	2.99	3.28	334,000	305,000
Maryland	4,685,795	5,256	823	6,079	14	1	15	2.66	1.22	2.47	2.99	3.20	335,000	312,000
Michigan	1,476,074	2,623	625	3,248	7	0	7	2.67	0	2.16	4.74	4.74	211,000	211,000
Missouri	3,760,607	8,650	957	9,607	7	1	8	.81	1.04	8.33	1.86	2.13	537,000	470,000
Montana	2,976,358	3,149	715	3,864	13	0	13	4.13	0	3.36	4.37	4.37	229,000	229,000
New Mexico	3,148,158	3,058	642	3,700	18	3	21	5.89	4.67	5.68	5.72	6.67	175,000	150,000
North Dakota	502,628	524	236	760	1	0	1	1.91	0	1.32	1.99	1.99	503,000	503,000
Ohio	30,759,986	40,363	5,096	45,459	108	1	109	2.68	.20	2.40	3.51	3.54	245,000	282,000
Oklahoma	3,074,242	7,419	1,310	8,729	33	0	33	4.45	0	3.78	10.74	10.74	93,000	93,000
Oregon	46,661	248	56	304	1	0	1	4.03	0	3.29	21.28	21.28	47,000	47,000
Pennsylvania (anthracite)	90,464,067	126,541	47,399	173,940	626	84	710	4.95	1.77	4.08	6.92	7.85	145,000	127,000
Pennsylvania (bituminous)	144,754,163	150,112	20,996	171,108	500	29	529	3.33	1.38	3.09	3.45	3.65	290,000	274,000
Tennessee	6,433,156	9,146	1,978	11,124	108	7	115	11.81	3.54	10.34	16.79	17.88	60,000	56,000
Texas	1,974,593	4,356	624	4,980	8	0	8	1.84	0	1.61	4.05	4.05	247,000	247,000
Utah	2,513,175	2,633	813	3,446	12	2	14	4.56	2.46	4.06	4.78	5.57	209,000	180,000
Virginia	6,864,667	6,691	1,416	8,107	60	8	68	8.97	5.64	8.39	8.74	9.91	114,000	101,000
Washington	3,572,815	5,589	1,647	7,236	24	3	27	4.29	1.82	3.73	6.72	7.56	149,000	132,000
West Virginia	59,831,580	55,498	11,302	66,800	332	18	350	5.98	1.59	5.24	5.55	5.85	180,000	171,000
Wyoming	6,744,864	6,838	1,280	8,118	31	2	33	4.53	1.56	4.07	4.50	4.89	218,000	204,000
Total	496,221,168	605,835	122,513	728,348	2,536	183	2,719	.....	.....	.....	.....	.....	.....	.....
Average	.....	.....	.....	.....	.....	.....	.....	4.19	1.49	3.73	5.11	5.48	196,000	183,000

[a] Selected from Mineral Resources, U. S., 1911: U. S. Geol. Survey.

FATAL COAL-MINE ACCIDENTS IN THE UNITED STATES, 1910 TO 1912, CLASSIFIED BY STATES AND ACCORDING TO CAUSE.

Table 3 shows the number of men killed in and about the coal mines of the United States from 1910 to 1912, inclusive, with the fatalities in each State classified according to cause. In these three years the fatalities underground constituted 89.93, 90.95, and 89.79 per cent, respectively, of the total number of men killed; fatalities in shafts 2.64, 2.32, and 2.29 per cent, and fatalities on the surface 7.43, 6.73, and 7.92 per cent.

TABLE 3.—*Number of men killed in and about the coal mines in the United States in the calendar years 1910, 1911, and 1912, with fatalities classified according to cause.*

1910.

State.	Killed underground.										Killed in shaft.					Killed on the surface.						
	Falls of roof (coal, rock, etc.).	Mine cars and locomotives.	Gas or dust explosions, windy or blown-out shots.	Explosives.	Suffocation from mine gases.	Electricity (shock or burns).	Animals.	Machinery other than locomotives, but including mining machines.	Gases from mine fires.	Other causes.	Total killed inside of mines.	Falling down shafts or slopes.	Objects falling down shafts or slopes.	Breaking of cables, chains, etc.	Overwinding.	Other causes.	Total killed by shaft accidents.	Mine cars and mine locomotives.	Electricity (shock or burns).	Machinery.	Boiler explosions.	Railway cars and locomotives.	Other causes.	Total killed by surface accidents.	Total by States.
Alabama	55	20	139	10	....	6	....	1	....	7	238	....	....	....	....	....	0	....	....	....	....	....	....	0	238
Alaska	....	....	....	....	....	....	....	....	....	....	0	....	....	....	....	....	0	....	....	....	....	....	....	0	0
Arkansas	10	....	4	....	....	....	....	....	....	....	14	....	....	....	....	....	0	....	....	....	....	....	....	0	14
California	....	....	....	....	....	....	....	....	....	....	0	....	....	....	....	....	0	....	....	....	....	....	....	0	0
Colorado	73	18	210	5	....	....	....	....	12	....	318	2	....	....	....	....	2	1	....	....	....	....	2	3	323
Georgia	....	....	....	....	....	....	....	....	....	....	0	....	....	....	....	....	0	....	....	....	....	....	....	0	0
Idaho	....	....	....	....	....	....	....	....	....	....	0	....	....	....	....	....	0	....	....	....	....	....	....	0	0
Illinois	74	27	8	9	....	1	4	....	....	....	123	5	2	....	....	6	13	1	....	....	....	....	....	1	143
Indiana	25	6	6	9	....	1	....	....	....	....	47	3	....	....	....	1	4	....	....	....	....	4	2	6	51
Iowa	21	4	1	2	....	....	1	....	....	....	29	3	....	....	....	....	3	1	....	....	....	....	....	1	33
Kansas	7	1	1	3	....	....	....	....	....	....	12	4	....	....	....	....	4	....	....	....	....	....	1	1	17
Kentucky	21	5	50	6	1	2	....	....	....	....	85	....	....	....	....	....	0	1	....	....	....	....	....	1	86
Maryland	10	3	....	1	....	....	....	....	....	1	15	....	....	....	....	....	0	1	....	....	....	....	1	2	17
Michigan	4	....	....	1	....	....	....	....	....	1	6	....	....	....	....	....	0	....	....	....	....	....	....	0	6
Missouri	8	3	....	1	....	....	....	....	....	2	14	....	....	....	....	....	0	....	....	....	....	....	....	0	14

Montana	7	3									**10**			2			**2**							**0**	**12**
New Mexico	15			1							**16**						**0**							**0**	**16**
North Dakota	1			1							**2**						**0**							**0**	**2**
Ohio	103	16	17	4		7		2			**149**	3					**3**	5		1		2	1	**9**	**161**
Oklahoma	11	3	16							1	**31**					2	**2**			1		1	5	**7**	**40**
Oregon											**0**						**0**							**0**	**0**
Pennsylvania (anthracite)	253	92	20	82	13	3	1	2		24	**490**	19					**19**	*a* 40		27			25	**92**	**601**
Pennsylvania (bituminous)	306	107	15	10		30	1	5		1	**475**	9					**9**	*a* 28	5	8	3		11	**55**	**539**
Tennessee	22	3		10		2					**37**						**0**	1						**1**	**38**
Texas	4	1				1				1	**7**						**0**							**0**	**7**
Utah	8	2		1				1			**12**						**0**	3						**3**	**15**
Virginia	35	1	10			3		3		2	**54**						**0**	1				2		**3**	**57**
Washington	9	5	18	4		3				3	**42**						**0**					1		**1**	**43**
West Virginia	203	51	3	8		20	1	4		1	**291**	9				5	**14**	18		1		2	3	**24**	**329**
Wyoming	25	4		8							**37**						**0**						1	**1**	**38**
Total	1,310	375	518	176	14	79	8	18	12	44	**2,554**	57	2	2	0	14	**75**	101	5	38	3	12	52	**211**	**2,840**
Percentage of total	46.13	13.21	18.24	6.20	0.49	2.78	0.28	0.63	0.42	1.55	**89.93**	2.01	0.07	0.07	0.00	0.49	**2.64**	3.56	0.18	1.34	0.10	0.42	1.83	**7.43**	**100.00**

a Includes those killed by railway cars.

TABLE 3.—*Number of men killed in and about the coal mines in the United States, etc.*—Continued.

1911.

State.	Killed underground.														Killed in shaft.						Killed on the surface.							
	Falls of roof (coal, rock, etc.).	Falls of coal (other than roof coal).	Mine cars and locomotives.	Gas explosions and burning gas.	Coal-dust explosions.[a]	"Blown-out or windy shots."	Explosives (includes premature blasts, explosion of misfires, suffocation by gases from explosives, by flying pieces from blasts, etc.).	Suffocation from mine gases.	Electricity (shock or burns).	Animals.	Mining machines.	Machines other than locomotives and mining machines.	Mine fires (burned, suffocated, etc.).	Other causes.	**Total killed inside of mines.**	Falling down shafts or slopes.	Objects falling down shafts or slopes.	Breaking of cables, chains, etc.	Overwinding.	Other causes.	**Total killed by shaft accidents.**	Mine cars and mine locomotives.	Electricity (shock or burns).	Machinery.	Boiler explosions.	Railway cars and locomotives.	Other causes.	**Total killed by surface accidents.**	**Total by States.**
Alabama	46	1	14	2	128	....	5	....	6	....	....	....	....	2	204	1	....	....	....	....	1	....	....	....	....	2	2	4	209
Alaska	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	....	....	....	....	....	0	....	....	....	....	....	....	0	0
Arkansas	9	....	1	....	....	....	....	....	....	....	....	....	....	1	11	....	....	....	....	1	1	....	....	....	....	....	....	0	12
California	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	....	....	....	....	....	0	....	....	....	....	....	....	0	0
Colorado	41	6	12	....	17	1	1	2	2	....	1	....	....	1	84	....	....	....	....	2	2	2	....	....	....	3	....	5	91
Georgia	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	....	....	....	....	....	0	....	....	....	....	....	....	0	0
Idaho	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	....	....	....	....	....	0	....	....	....	....	....	....	0	0
Illinois	70	16	40	1	8	....	13	....	3	1	....	....	....	1	153	8	1	....	....	3	12	1	....	1	....	1	4	7	172
Indiana	17	2	4	1	2	1	10	....	2	....	1	....	....	....	40	3	....	....	....	....	3	1	....	....	....	1	1	3	46
Iowa	22	....	12	....	....	....	....	....	....	....	1	....	....	1	36	2	1	1	....	....	4	....	....	....	....	....	....	0	40
Kansas	20	....	....	7	....	3	3	3	1	....	....	....	....	3	40	1	....	....	....	....	1	....	....	....	1	....	....	1	42
Kentucky	26	1	3	....	1	....	3	....	4	....	1	....	....	2	41	....	....	....	....	....	0	1	....	1	....	2	....	4	45
Maryland	12	....	1	....	....	....	....	....	....	....	....	....	....	1	14	....	....	....	....	....	0	....	....	....	....	1	....	1	15
Michigan	3	1	....	....	....	....	....	....	2	....	....	....	....	1	7	....	....	....	....	....	0	....	....	....	....	....	....	0	7
Missouri	6	1	....	....	....	....	....	....	....	....	....	....	....	....	7	....	....	....	....	....	0	....	....	....	....	1	....	1	8
Montana	7	3	2	....	....	....	1	....	....	....	....	....	....	....	13	....	....	....	....	....	0	....	....	....	....	....	....	0	13
New Mexico	14	2	1	....	....	....	1	....	....	....	....	....	....	....	18	....	....	....	....	....	0	....	....	2	....	1	....	3	21
North Dakota	....	....	....	....	....	....	1	....	....	....	....	....	....	....	1	....	....	....	....	....	0	....	....	....	....	....	....	0	1
Ohio	78	12	12	....	....	....	1	....	3	....	2	....	....	....	108	....	....	....	....	....	0	....	....	....	....	1	....	1	109

Oklahoma	9	....	6	3	.....	4	4	....	1	....	.....	.....	2	....	**29**	.....	.....	.....	.....	4	**4**	.....	.....	.....	.....	.....	.....	**0**	**33**
Oregon	1	....	.....	.....	.....	.....	.....	....	.....	....	.....	.....	.....	....	**1**	.....	.....	.....	.....	.....	**0**	.....	.....	.....	.....	.....	.....	**0**	**1**
Pa. (anthracite)	254	28	97	30	.....	.....	80	1	3	3	....	1	78	24	**599**	21	2	2	1	1	**27**	18	1	22	1	8	34	**84**	**710**
Pa. (bituminous)	281	36	95	22	8	....	3	1	35	2	3	1	....	9	**496**	2	.....	.....	.....	2	**4**	7	1	3	....	6	12	**29**	**529**
Tennessee	15	....	6	....	84	....	1	....	1	....	.....	.....	.....	1	**108**	.....	.....	.....	.....	.....	**0**	3	1	.....	....	1	2	**7**	**115**
Texas	5	....	1	.....	.....	....	2	....	.....	....	.....	.....	.....	....	**8**	.....	.....	.....	.....	.....	**0**	.....	.....	.....	.....	.....	.....	**0**	**8**
Utah	7	3	2	....	.....	....	.....	....	.....	....	.....	.....	.....	....	**12**	.....	.....	.....	.....	.....	**0**	.....	.....	.....	1	1	.....	**2**	**14**
Virginia	35	....	18	5	.....	....	.....	....	2	....	.....	.....	.....	....	**60**	.....	.....	.....	.....	.....	**0**	4	....	.....	....	.....	4	**8**	**68**
Washington	11	....	6	....	.....	....	2	1	2	....	.....	.....	.....	....	**22**	2	.....	.....	.....	.....	**2**	2	....	1	....	.....	.....	**3**	**27**
West Virginia	166	28	58	27	23	....	2	....	20	1	4	.....	.....	1	**330**	2	.....	.....	.....	.....	**2**	5	4	2	....	3	4	**18**	**350**
Wyoming	18	8	2	1	.....	.....	1	....	.....	....	.....	.....	.....	1	**31**	.....	.....	.....	.....	.....	**0**	1	....	1	....	.....	.....	**2**	**33**
Total	1,173	148	393	99	271	9	134	8	87	7	13	2	80	49	**2,473**	42	4	3	1	13	**63**	45	7	33	3	32	63	**183**	**2,719**
Percentage of total	43.14	5.44	14.45	3.64	9.97	0.33	4.93	0.29	3.20	0.26	0.48	0.08	2.94	1.80	**90.95**	1.54	0.15	0.11	0.04	0.48	**2.32**	1.65	0.26	1.21	0.11	1.18	2.32	**6.73**	**100.00**

[a] These dust explosions may have been started by powder or gas explosions or other initiating causes.

TABLE 3.—*Number of men killed in and about the coal mines of the United States, etc.*—Continued.

1912.

State.	Killed underground.														Killed in shaft.						Killed on the surface.							
	Falls of roof (coal, rock, etc.).	Falls of coal (other than roof coal).	Mine cars and locomotives.	Gas explosions and burning gas.	Coal-dust explosions.	Explosions of coal dust and gas together.	Explosives (includes premature blasts, explosion of misfires, suffocation by gases from explosives, etc.).	Suffocation from mine gases.	Electricity (shock or burns).	Animals.	Mining machines.	Machines other than locomotives and mining machines.	Mine fires (burned, suffocated, etc.).	Other causes.	**Total killed inside of mines.**	Falling down shafts or slopes.	Objects falling down shafts or slopes.	Breaking of cables, chains, etc.	Overwinding.	Other causes.	**Total killed by shaft accidents**	Mine cars and mine locomotives.	Electricity (shock or burns).	Machinery.	Boiler explosions.	Railway cars and locomotives.	Other causes.	**Total killed by surface accidents.**	**Total by States.**
Alabama	54	7	11	5	2	18	3	....	9	....	....	....	....	1	**110**	2	1	....	....	1	**4**	7	....	1	....	3	....	**7**	**121**
Alaska	....	....	....	....	....	....	....	....	....	....	....	....	....	....	**0**	....	....	....	....	....	**0**	....	....	....	....	....	....	**0**	**0**
Arkansas	5	....	....	....	....	....	....	....	....	....	....	....	....	....	**5**	....	....	....	....	1	**1**	....	....	....	....	....	....	**0**	**6**
California	....	....	2	....	....	....	....	....	....	....	....	....	....	....	**2**	....	....	....	....	....	**0**	....	....	....	....	....	....	**0**	**2**
Colorado	45	5	14	15	....	2	1	....	6	1	....	....	....	2	**91**	1	....	....	....	1	**2**	1	....	....	....	1	....	**2**	**95**
Georgia	1	....	....	....	....	....	1	....	....	....	....	....	....	....	**2**	....	....	....	....	....	**0**	....	....	....	....	....	....	**0**	**2**
Idaho and Nevada	....	....	....	....	....	....	....	....	....	....	....	....	....	....	**0**	....	....	....	....	....	**0**	....	....	....	....	....	....	**0**	**0**
Illinois	76	8	39	3	....	....	10	....	2	1	1	....	....	1	**141**	6	1	1	1	2	**11**	....	....	....	....	3	4	**7**	**159**
Indiana	20	....	7	3	6	....	2	....	....	1	....	....	....	....	**39**	....	....	....	....	....	**0**	....	....	....	....	....	1	**1**	**40**
Iowa	9	2	3	....	2	....	3	....	....	....	....	....	....	....	**19**	....	....	....	....	....	**0**	....	....	....	....	....	....	**0**	**19**
Kansas	10	1	2	....	4	5	2	1	1	....	....	....	....	....	**26**	....	....	....	....	1	**1**	....	....	....	....	1	....	**1**	**28**
Kentucky	19	1	3	5	5	....	1	....	5	....	....	....	....	2	**41**	....	....	....	1	1	**2**	2	....	....	....	1	5	**8**	**51**
Maryland	9	2	1	....	....	....	....	....	....	....	....	....	....	....	**12**	....	....	....	....	....	**0**	....	....	....	....	....	1	**1**	**13**
Michigan	4	....	....	....	....	....	....	....	1	....	....	1	....	....	**6**	....	1	....	....	....	**1**	....	....	....	....	1	....	**1**	**8**
Missouri	6	3	1	....	2	....	....	....	2	1	....	....	....	1	**16**	....	....	....	....	1	**1**	1	1	1	....	....	....	**3**	**20**
Montana	2	1	2	....	....	....	2	....	....	....	....	....	....	....	**7**	....	....	....	....	....	**0**	....	....	....	....	....	....	**0**	**7**
New Mexico	8	1	6	....	....	....	....	....	....	....	....	....	....	....	**15**	....	....	....	....	....	**0**	....	....	....	....	....	....	**0**	**15**
North Dakota	....	....	....	....	....	....	....	....	....	....	....	....	....	....	**0**	....	....	....	....	....	**0**	....	....	....	....	....	....	**0**	**0**

Ohio	90	6	18	1	....	....	6	....	2	....	1	....	....	1	**125**	1	....	....	....	3	**4**	....	....	2	....	1	1	**4**	**133**
Oklahoma	6	1	3	75	2	....	1	....	....	....	....	....	11	....	**99**	....	....	....	....	....	**0**	....	....	....	....	....	....	**0**	**99**
Oregon	....	....	....	1	....	....	....	....	....	....	....	....	....	....	**1**	....	....	....	....	....	**0**	....	....	....	....	....	....	**0**	**1**
Pennsylvania (anthracite)	165	72	82	36	....	....	76	8	5	2	....	1	....	29	**476**	12	2	....	....	....	**14**	34	3	20	....	....	37	**94**	**584**
Pennsylvania (bituminous)	200	42	105	1	....	....	7	....	17	1	5	2	....	15	**395**	4	....	....	....	2	**6**	17	3	5	1	1	9	**36**	**437**
Tennessee	12	2	2	....	....	....	1	....	....	....	....	....	....	....	**17**	....	....	....	....	....	**0**	....	....	....	....	....	1	**1**	**18**
Texas	....	....	....	....	....	....	....	....	....	....	....	....	....	....	**0**	....	....	....	....	1	**1**	1	....	....	....	....	....	**1**	**2**
Utah	2	11	1	....	....	....	....	1	1	....	....	....	....	....	**16**	....	....	....	....	....	**0**	....	....	1	....	....	1	**2**	**18**
Virginia	33	....	9	10	....	....	10	....	4	....	1	....	....	....	**67**	1	....	....	....	....	**1**	3	1	....	....	1	2	**7**	**75**
Washington	3	....	3	....	....	1	1	....	3	....	....	....	....	2	**13**	1	....	....	....	....	**1**	....	....	....	....	....	....	**0**	**14**
West Virginia	175	12	44	9	....	81	6	....	17	....	2	....	....	....	**346**	....	....	1	....	2	**3**	5	1	....	....	1	3	**10**	**359**
Wyoming	18	2	4	....	7	....	....	....	1	....	....	....	....	....	**32**	....	....	....	....	1	**1**	1	....	....	....	....	....	**1**	**34**
Total	972	179	362	164	30	107	133	10	76	7	10	4	11	54	**2,119**	28	5	2	2	17	**54**	68	9	30	1	14	65	**187**	**2,360**
Percentage of total	41.19	7.58	15.34	6.95	1.27	4.53	5.64	0.42	3.22	0.30	0.42	0.17	0.47	2.29	**89.79**	1.19	0.22	0.08	0.08	0.72	**2.29**	2.88	0.38	1.27	0.04	0.59	2.76	**7.92**	**100.00**

As the same detailed classification of fatalities was not used for each of the three years under consideration, it has been necessary, for purposes of comparison, to adopt the more condensed classification of principal causes given in figures 7, 8, and 9. In 1910, 1911, and 1912, the percentages of deaths by falls of roof and coal were 46.13, 48.58, and 48.77 per cent; by gas and coal-dust explosions 18.24, 13.94, and 12.75 per cent; by mine cars and mine locomotives (underground) 13.21, 14.45, and 15.34 per cent. These three causes account for more than three-quarters of the total number of fatalities in and about the mines. The figures show that accidents from falls of roof and coal killed more men than any other two causes combined and that they account for more than half of the deaths by accidents underground. In 1910 there were more men killed by gas and coal-dust explosions than by mine cars and locomotives, whereas in 1911 the number killed by each of these two causes was practically equal. In 1912, however, the number killed by gas and coal-dust explosions was less than the number killed by mine cars and mine locomotives. The percentages of deaths caused by explosives (underground) were 6.20, 4.93, and 5.64, respectively, and by electricity (underground) 2.78, 3.20, and 3.22, the two causes combined killing between 8 and 9 per cent of the total number. The figures mentioned are presented below.

Figure 10 gives the total number of men killed by various causes in the calendar years 1910, 1911, and 1912, and shows the death rate by causes per 1,000 men employed. It indicates that the reduction in the death rate during the past three years has been most marked in the case of deaths due to gas and coal-dust explosions and those due to explosives. It is perhaps not entirely a coincidence that the greatest improvement has been effected in those lines along which the bureau's investigative and educational work has been chiefly directed.

NUMBER KILLED.		PERCENTAGE OF TOTAL NUMBER KILLED.
Grand total	2,840	100.00
Underground (total)	2,554	89.93
By falls of roof and coal	1,310	46.13
By gas and coal-dust explosions	518	18.24
By mine cars and mine locomotives (underground).	375	13.21
By explosives (underground)	176	6.20
By electricity (underground)	79	2.78
By other causes (underground)	96	3.37
In shafts (total)	75	2.64
On the surface (total)	211	7.43

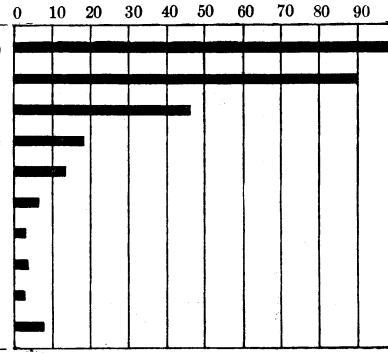


FIGURE 7.—Fatal coal-mine accidents, classified by cause, during 1910.

NUMBER KILLED.		PERCENTAGE OF TOTAL NUMBER KILLED.
Grand total	2,719	100.00
Underground (total)	2,473	90.95
By falls of roof and coal	1,321	48.58
By mine cars and mine locomotives (underground).	393	14.45
By gas and coal-dust explosions	379	13.94
By explosives (underground)	134	4.93
By electricity (underground)	87	3.20
By mine fires	80	2.94
By other causes (underground)	79	2.91
In shafts (total)	63	2.32
On the surface (total)	183	6.73

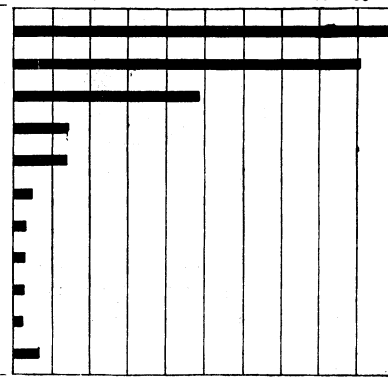


FIGURE 8.—Fatal coal-mine accidents, classified by cause, during 1911.

NUMBER KILLED.		PERCENTAGE OF TOTAL NUMBER KILLED.
Grand total	2,360	100.00
Underground (total)	2,119	89.79
By falls of roof and coal	1,151	48.77
By mine cars and mine locomotives (underground).	362	15.34
By gas and coal-dust explosions	301	12.75
By explosives (underground)	133	5.64
By electricity (underground)	76	3.22
By other causes (underground)	96	4.07
In shafts (total)	54	2.29
On the surface (total)	187	7.92

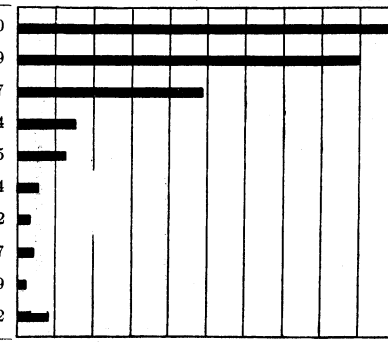


FIGURE 9.—Fatal coal-mine accidents, classified by cause, during 1912.

CAUSE.	YEAR.	NUMBER KILLED.	NUMBER KILLED PER 1,000 EMPLOYED.
All causes (grand total)	1910	2,840	3.92
	1911	2,719	3.73
	1912	2,360	3.15
Underground accidents	1910	2,554	3.52
	1911	2,473	3.40
	1912	2,119	2.83
Falls of roof and coal	1910	1,310	1.81
	1911	1,321	1.81
	1912	1,151	1.53
Mine cars and mine locomotives (underground)	1910	375	.52
	1911	393	.54
	1912	362	.48
Gas and coal-dust explosions	1910	518	.71
	1911	379	.52
	1912	301	.40
Explosives (underground)	1910	176	.24
	1911	134	.18
	1912	133	.18
Electricity (underground)	1910	79	.11
	1911	87	.12
	1912	76	.10
Other causes (underground)	1910	96	.13
	1911	159	.22
	1912	96	.13
Shaft accidents (total)	1910	75	.11
	1911	63	.09
	1912	54	.07
Surface accidents (total)	1910	211	.29
	1911	183	.25
	1912	187	.25

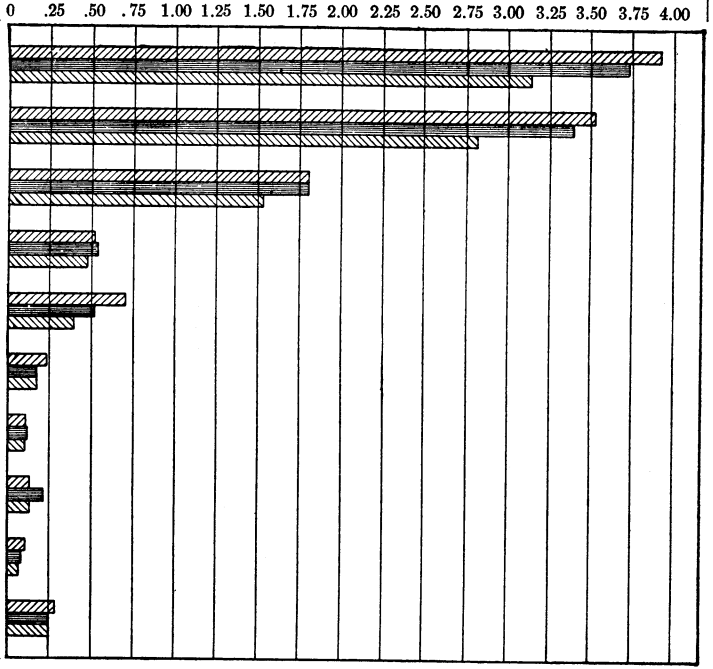


FIGURE 10.—Number of men killed and number killed per 1,000 employed in and about the coal mines in the United States in 1910, 1911, and 1912.

MONTHLY STATISTICS OF COAL-MINE ACCIDENTS IN THE UNITED STATES IN 1912.

Through the kindness of the State mine inspectors and the State mining departments of the various coal-producing States, the bureau received monthly reports of fatalities in and about coal mines during 1912. Tables 4 and 5 were compiled from these reports, supplemented by reports received from the mine operators in those States having no system of coal-mine inspection. This is the first time that monthly statistics of coal-mine accidents in this country for an entire year have been compiled. The tables follow.

TABLE 4.—*Total number of men killed in and about the coal mines in the United States during the calendar year* ***1912.***

State.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
Alabama	10	13	8	9	12	5	7	25	4	10	12	6	121
Alaska and California	0	0	0	0	0	0	0	2	0	0	0	0	2
Arkansas	0	1	0	0	0	1	0	1	1	1	0	1	6
Colorado	12	8	8	4	9	17	6	5	4	12	6	4	95
Georgia	0	0	0	0	0	0	0	1	0	0	0	1	2
Idaho and Nevada	0	0	0	0	0	0	0	0	0	0	0	0	0
Illinois	17	17	21	4	12	6	6	11	12	25	12	16	159
Indiana	3	3	4	0	1	3	4	4	3	5	5	5	40
Iowa	4	1	3	0	0	0	1	2	5	1	2	0	19
Kansas	5	5	3	0	0	3	2	0	2	3	3	2	28
Kentucky	8	6	3	5	4	4	3	4	6	7	1	0	51
Maryland	1	2	0	1	1	4	2	1	0	1	0	0	13
Michigan	1	1	1	0	0	1	0	0	0	1	3	0	8
Missouri	3	2	1	2	0	0	2	2	0	5	1	2	20
Montana	0	0	0	1	1	2	0	0	1	0	1	1	7
New Mexico	3	1	0	0	1	0	2	0	1	1	2	4	15
North Dakota	0	0	0	0	0	0	0	0	0	0	0	0	0
Ohio	13	11	11	2	11	10	7	12	13	16	13	14	133
Oklahoma	2	12	75	1	0	1	2	0	2	1	0	3	99
Oregon	1	0	0	0	0	0	0	0	0	0	0	0	1
Pennsylvania (anthracite)	66	59	65	8	20	45	63	56	50	45	59	48	584
Pennsylvania (bituminous)	43	37	42	18	36	32	36	36	50	40	35	32	437
Tennessee	4	1	0	2	0	0	4	4	0	1	1	1	18
Texas	0	0	0	0	0	2	0	0	0	0	0	0	2
Utah	1	0	2	1	4	1	2	4	0	0	2	1	18
Virginia	12	6	5	3	5	8	13	7	5	1	7	3	75
Washington	1	2	1	3	0	1	1	0	0	5	0	0	14
West Virginia	34	24	101	17	27	22	28	34	16	19	18	19	359
Wyoming	8	1	6	0	6	2	2	0	0	3	4	2	34
Total	252	213	360	[a] 81	150	170	193	211	175	203	187	165	2,360

[a] During April suspensions pending wage settlements in many of the leading coal-producing States materially reduced the number of men working in the mines, and consequently the number of fatalities.

TABLE 5.—*Number of men killed in and about the coal mines in the United States in the calendar year* **1912**, *with fatalities classified by months and according to cause.*

Month.	Killed underground.														Killed in shaft.						Killed on the surface.							Total by months.
	Falls of roof (coal, rock, etc.).	Falls of coal (other than roof coal).	Mine cars and locomotives.	Gas explosions and burning gas.	Coal-dust explosions.	Explosions of coal dust and gas together.	Explosives (includes premature blasts, explosion of misfires, suffocation by gases from explosives, etc.).	Suffocation from mine gases.	Electricity (shock or burns).	Animals.	Mining machines.	Machines other than locomotives and mining machines.	Mine fires (burned, suffocated, etc.).	Other causes.	Total.	Falling down shafts or slopes.	Objects falling down shafts or slopes.	Breaking of cables, chains, etc.	Overwinding.	Other causes.	Total.	Mine cars and mine locomotives.	Electricity (shock or burns).	Machinery.	Boiler explosions.	Railway cars and locomotives.	Other causes.	Total.	
January	107	15	44	8	17	....	22	1	7	....	....	....	....	3	224	8	....	....	....	....	8	8	....	4	....	1	7	20	252
February	90	16	37	5	4	....	13	....	6	1	2	....	11	2	187	4	1	1	....	3	9	5	....	3	....	1	8	17	213
March	89	19	27	78	....	82	22	1	4	1	....	2	....	8	333	3	....	1	....	1	5	4	2	4	1	3	8	22	360
April	39	6	3	8	1	1	5	....	4	....	....	....	....	1	68	2	....	....	....	1	3	4	....	2	....	....	4	10	81
May	80	12	26	5	....	....	8	1	3	....	2	....	....	1	138	....	....	....	1	1	2	3	....	2	....	2	3	10	150
June	81	12	23	14	....	....	6	1	6	....	1	1	....	2	147	....	2	....	....	2	4	8	....	4	....	2	5	19	170
July	84	16	22	25	....	....	14	2	9	....	....	....	....	9	181	2	....	....	....	1	3	5	1	....	....	....	3	9	193
August	83	17	40	5	....	18	11	1	11	1	2	....	....	2	191	1	....	....	....	....	1	7	1	5	....	....	6	19	211
September	81	21	27	7	1	....	9	....	8	....	....	....	....	6	160	3	....	....	....	1	4	4	2	....	....	....	5	11	175
October	86	15	39	1	4	4	8	....	12	2	1	....	....	6	178	1	2	....	1	1	5	9	2	3	....	2	4	20	203
November	78	19	41	2	3	1	5	1	4	2	1	1	....	6	164	....	....	....	....	5	5	5	1	....	....	2	10	18	187
December	74	11	33	6	....	1	10	2	2	....	1	....	....	8	148	4	....	....	....	1	5	6	....	3	....	1	2	12	165
Total	972	179	362	164	30	107	133	10	76	7	10	4	11	54	2,119	28	5	2	2	17	54	68	9	30	1	14	65	187	2,360
Percentage of total	41.19	7.58	15.34	6.95	1.27	4.53	5.64	0.42	3.22	0.30	0.42	0.17	0.47	2.29	89.79	1.19	0.22	0.08	0.08	0.72	2.29	2.88	0.38	1.27	0.04	0.59	2.76	7.92	100.00

The risk of coal mining is greatest during the winter months, when the liability of serious mine explosions is increased by the drying of the mines through the entrance of air below the temperature of the workings. It has been stated that this drying process also increases the danger from falls of roof and coal. Figures 11 and 12 are presented with the idea of discovering whether such increased risks were apparent during the colder months of 1912. Of course, a true comparison of the relative risks of coal mining during various months can not be determined without knowing the number of men employed in the mines in those months and the number of hours the mines were in actual operation. The data are, however, presented for what they are worth. Figure 11 shows that March, with 360 deaths, was the most disastrous month of 1912, followed by January and February,

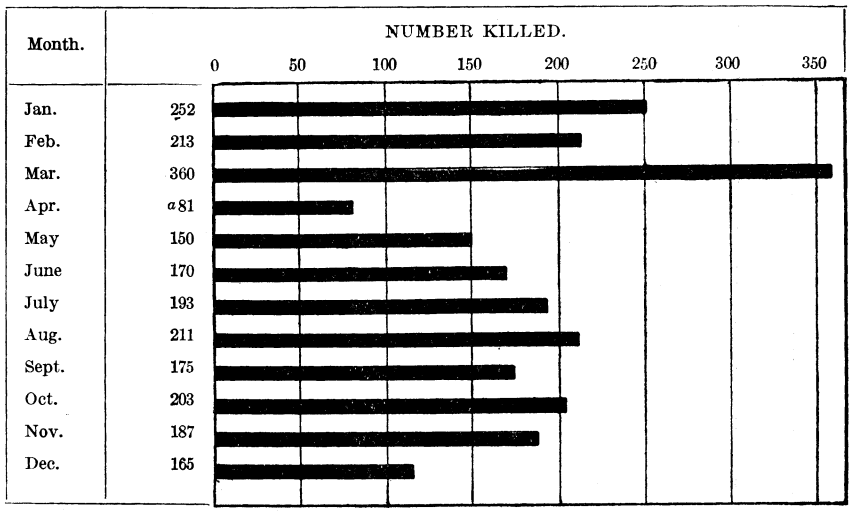


FIGURE 11.—Fatalities in and about the coal mines during 1912, by months.

with 252 and 213 deaths, respectively. Attention is called to the extremely small loss of life in April, but this is accounted for by a material reduction in the number of men working in the mines during that month pending wage settlements in many of the leading coal-producing States. From figure 12, which shows the number of fatalities caused by falls of roof and coal, and by gas and coal-dust explosions, during the different months of 1912, it may be seen that, regarding the number of deaths due to falls of roof and coal, January heads the list with 122 fatalities, followed by March and February with 108 and 106 deaths, respectively. As regards fatalities due to gas and coal-dust explosions, March was by far the most disastrous

a During April suspensions pending wage settlements in many of the leading coal-producing States materially reduced the number of men working in the mines, and consequently caused a reduction in the number of fatalities.

month, with the worst two mine explosions of the year, one, in which 73 men were killed, occurring at the San Bois No. 2 mine, at McCur-

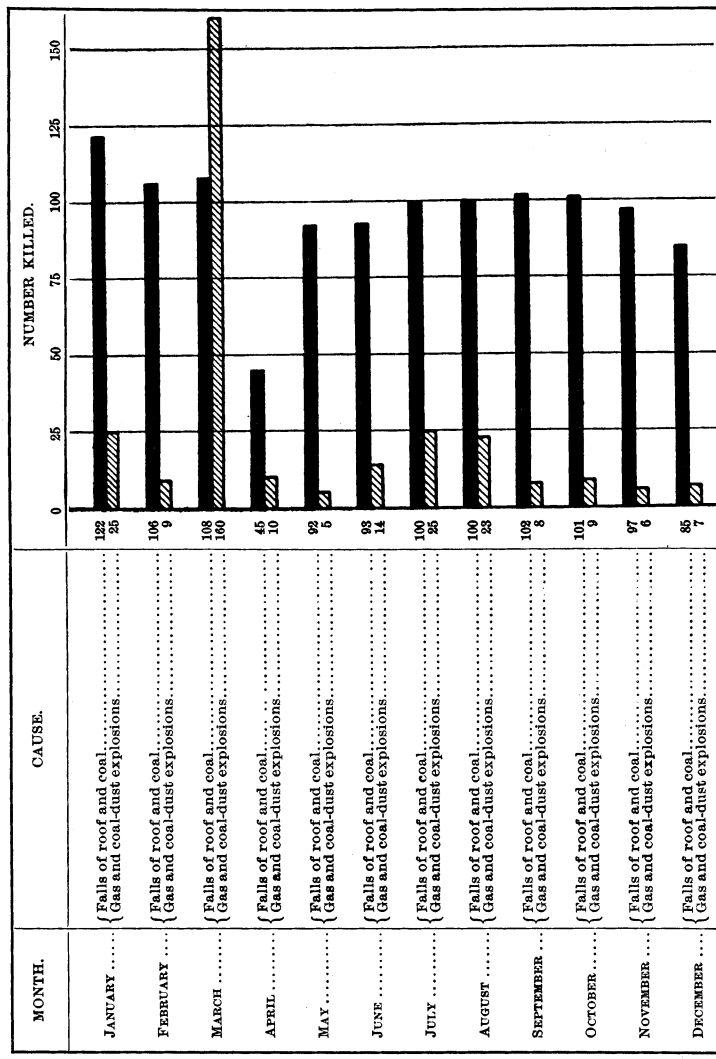


FIGURE 12.—Number killed by falls of roof and coal and by gas and coal-dust explosions during 1912, by months.

tain, Okla., on March 20, and the other, in which 81 men lost their lives, taking place at the Jed mine, at Jed, W. Va., on March 26.

NONFATAL ACCIDENTS IN THE COAL MINES IN THE UNITED STATES IN 1911.

As already stated, in 1911 the Bureau of Mines received reports of accidents from the coal-mine operators throughout the country. The table following (Table 6), giving the number of men seriously and slightly injured in and about the coal mines during 1911, was compiled directly from these reports. For purposes of classification a serious injury has been considered as one involving the breaking of an arm, leg, or rib, or in any manner causing the loss of 20 or more days' work, and a slight injury as one involving disablement for more than 1 day and less than 20.

TABLE 6.—*Number of men injured in and about the coal mines in the United States in the calendar year* ***1911.***

SERIOUSLY INJURED.

State.	Injured underground.															Injured in shaft.						Injured on the surface.							
	Falls of roof (coal, rock, etc.).	Falls of coal (other than roof coal).	Mine cars and locomotives.	Gas explosions and burning gas.	Coal-dust explosions.	Explosions of coal dust and gas together.	"Blown-out or windy shots."	Explosives (includes premature blasts, explosion of misfires, suffocation by gases from explosives).	Suffocation from mine gases.	Electricity (shock or burns).	Animals.	Mining machines.	Machines other than haulage motors and mining machines.	Mine fires (burned, suffocated, etc.).	Other causes.	**Total injured insideof mines.**	Falling down shafts or slopes.	Objects falling down shafts or slopes.	Breaking of cables, chains, etc.	Overwinding.	Other causes.	**Total injured by shaft accidents.**	Mine cars and mine locomotives.	Electricity (shock or burns).	Machinery.	Boiler explosions.	Railway cars and locomotives.	Other causes.	**Total injured by surface accidents.**	**Total by States.**
Alabama	150	17	139	33	....	3	5	15	....	4	5	7	4	....	31	**413**	1	1	....	....	....	**2**	5	....	8	3	6	12	**34**	**449**
Alaska	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	**0**	....	....	....	....	....	**0**	....	....	....	....	....	....	**0**	**0**
Arkansas	10	3	9	3	....	....	....	1	....	....	....	....	....	....	....	**26**	1	....	....	....	1	**2**	....	....	....	....	1	2	**3**	**31**
California	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	**0**	....	....	....	....	....	**0**	....	....	....	....	....	....	**0**	**0**
Colorado	61	38	47	6	....	....	1	2	....	....	6	8	2	....	5	**176**	1	....	1	....	1	**3**	2	....	2	....	....	1	**5**	**184**
Georgia	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	**0**	....	....	....	....	....	**0**	....	....	....	....	....	....	**0**	**0**
Idaho	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	**0**	....	....	....	....	....	**0**	....	....	....	....	....	....	**0**	**0**
Illinois	364	172	298	21	....	....	4	16	....	8	47	39	3	3	64	**1,039**	5	16	....	4	10	**35**	5	....	10	....	10	18	**43**	**1,117**
Indiana	68	32	43	5	....	....	3	12	3	....	20	12	....	....	14	**212**	....	2	....	....	1	**3**	1	....	3	....	1	10	**15**	**230**
Iowa	86	17	52	....	....	....	....	....	....	....	5	....	....	....	4	**164**	2	1	....	....	1	**4**	....	....	7	....	2	2	**11**	**179**
Kansas	41	3	13	12	....	1	2	4	1	....	5	....	1	....	1	**84**	....	....	....	....	2	**2**	1	....	....	....	1	5	**7**	**93**
Kentucky	77	8	53	....	....	2	1	6	1	4	7	9	....	....	6	**174**	3	....	1	....	2	**6**	5	....	1	....	2	4	**12**	**192**
Maryland	48	19	40	....	....	....	....	5	....	....	1	....	....	....	24	**137**	....	....	....	....	....	**0**	6	....	2	....	....	3	**11**	**148**
Michigan	12	1	6	1	....	....	....	....	....	2	4	....	....	....	3	**29**	....	....	....	....	....	**0**	....	....	....	....	....	....	**0**	**29**
Missouri	33	5	6	2	1	....	....	....	....	....	7	1	....	....	....	**55**	2	....	1	....	....	**3**	....	....	1	....	....	2	**3**	**61**
Montana	15	8	9	....	....	....	2	2	....	....	....	....	....	....	1	**37**	....	....	....	....	....	**0**	....	....	....	....	....	4	**4**	**41**
New Mexico	14	11	18	1	....	....	....	1	....	....	1	1	1	....	1	**49**	....	....	....	....	....	**0**	3	....	....	....	1	1	**5**	**54**
North Dakota	2	....	1	....	....	....	....	2	....	....	....	....	....	....	....	**5**	....	....	....	....	....	**0**	1	2	2	....	....	....	**5**	**10**
Ohio	205	23	102	4	....	1	3	4	....	....	14	22	3	2	15	**398**	1	....	....	....	1	**2**	14	....	7	....	4	6	**31**	**431**
Oklahoma	28	5	18	16	....	....	1	5	....	....	4	1	....	....	3	**81**	2	2	4	....	....	**8**	2	....	....	....	1	1	**4**	**93**
Oregon	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	**2**	....	....	....	....	....	**0**	....	....	....	....	....	....	**0**	**2**

Pennsylvania (anthracite)	424	168	361	225	....	....	3	140	....	10	24	2	7	1	266	**1,631**	9	9	1	3	6	**28**	105	....	92	....	19	129	**345**	**2,004**
Pennsylvania (bituminous)	802	248	544	6	....	....	7	44	....	32	29	92	13	....	129	**1,946**	....	....	....	....	7	**7**	48	3	22	2	11	65	**151**	**2,104**
Tennessee	68	6	17	3	....	....	....	1	....	....	....	6	....	....	2	**103**	....	2	....	....	....	**2**	7	....	2	....	....	3	**12**	**117**
Texas	9	3	7	1	....	....	....	2	....	....	....	....	....	....	1	**23**	2	1	....	....	....	**3**	1	....	2	....	16	2	**21**	**47**
Utah	19	15	20	....	....	....	....	1	....	....	....	1	2	....	22	**80**	....	....	....	....	....	**0**	5	....	2	1	1	5	**14**	**94**
Virginia	77	5	49	8	....	....	1	10	....	1	3	1	1	....	3	**159**	....	....	....	....	....	**0**	10	1	1	....	....	4	**16**	**175**
Washington	42	15	34	10	....	....	1	3	....	....	....	....	2	....	7	**114**	2	....	....	....	....	**2**	9	....	1	....	2	....	**12**	**128**
West Virginia	338	86	244	8	....	....	8	36	2	2	20	40	6	....	36	**826**	....	1	....	2	2	**5**	40	3	16	3	13	12	**87**	**918**
Wyoming	58	6	49	....	1	....	1	5	....	....	4	3	....	....	26	**153**	....	....	....	....	....	**0**	4	....	11	1	1	5	**22**	**175**
Total	3,052	915	2,179	365	2	7	43	317	7	63	206	245	45	6	664	**8,116**	31	35	8	9	34	**117**	274	9	192	10	92	296	**873**	**9,106**
Percentage of total	33.52	10.05	23.93	4.01	0.02	0.08	0.47	3.48	0.08	0.69	2.26	2.69	0.49	0.07	7.29	**89.13**	0.34	0.38	0.09	0.10	0.37	**1.28**	3.01	0.10	2.11	0.11	1.01	3.25	**9.59**	**100.00**

SLIGHTLY INJURED.

Alabama	470	200	821	36	....	....	14	37	....	26	79	58	27	....	387	**2,155**	1	3	3	....	19	**26**	66	....	36	....	16	99	**217**	**2,398**
Alaska	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	**0**	....	....	....	....	....	**0**	....	....	....	....	....	....	**0**	**0**
Arkansas	16	5	13	6	....	....	....	4	....	....	3	....	....	....	1	**48**	....	5	....	....	3	**8**	2	....	3	....	1	2	**8**	**64**
California	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	**0**	....	....	....	....	....	**0**	....	....	....	....	....	....	**0**	**0**
Colorado	154	30	70	6	....	....	1	5	....	1	10	10	4	....	44	**335**	1	....	....	....	1	**2**	2	....	3	1	5	9	**20**	**357**
Georgia	4	....	6	....	....	....	....	....	....	....	....	....	....	....	....	**10**	....	....	....	....	....	**0**	4	....	....	....	....	....	**4**	**14**
Idaho	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	**0**	....	....	....	....	....	**0**	....	....	....	....	....	....	**0**	**0**
Illinois	894	387	953	35	....	1	4	11	2	27	282	106	39	7	459	**3,207**	4	52	1	9	15	**81**	25	5	61	3	51	147	**292**	**3,580**
Indiana	180	100	273	19	....	....	1	5	5	9	90	37	10	2	82	**813**	1	4	2	....	7	**14**	2	1	23	1	13	42	**82**	**909**
Iowa	135	32	123	1	1	1	2	....	....	....	34	....	2	1	14	**346**	1	1	4	....	....	**6**	2	....	4	....	2	14	**22**	**374**
Kansas	54	13	21	20	2	1	1	3	1	1	10	....	....	....	6	**133**	....	3	....	....	2	**5**	1	2	5	1	3	10	**22**	**160**
Kentucky	182	37	238	....	....	2	3	5	4	7	58	76	10	....	117	**739**	....	....	....	2	3	**5**	31	....	6	....	5	23	**65**	**809**
Maryland	51	15	12	....	....	....	....	2	....	....	....	....	1	....	9	**90**	....	....	....	....	....	**0**	....	....	2	....	2	1	**5**	**95**
Michigan	28	7	24	....	....	....	1	1	....	....	7	3	....	....	4	**75**	....	....	....	....	....	**0**	....	....	1	....	....	2	**3**	**78**
Missouri	81	16	40	....	....	....	1	....	4	1	11	2	1	....	4	**161**	....	1	....	1	1	**3**	5	....	3	....	1	5	**14**	**178**
Montana	12	6	12	1	....	....	....	1	....	....	1	2	....	....	5	**40**	....	....	....	....	....	**0**	1	....	5	....	....	3	**9**	**49**
New Mexico	39	11	27	1	....	....	....	1	....	....	1	2	1	....	4	**87**	....	....	....	....	....	**0**	5	1	3	....	1	4	**14**	**101**
North Dakota	4	....	6	....	....	....	....	2	....	....	1	2	....	....	....	**15**	....	....	....	....	1	**1**	....	1	1	....	1	....	**3**	**19**
Ohio	270	53	220	6	....	2	3	7	1	10	17	48	4	1	39	**681**	3	2	3	....	1	**9**	32	....	6	....	15	23	**76**	**766**
Oklahoma	65	8	35	18	....	....	1	1	2	....	13	2	3	....	11	**159**	1	2	2	....	1	**6**	3	....	1	1	1	5	**11**	**176**
Oregon	1	....	3	....	....	....	....	....	....	....	....	....	....	....	....	**4**	....	....	....	....	....	**0**	1	....	....	....	....	....	**1**	**5**
Pennsylvania (anthracite)	634	298	416	151	....	....	4	77	1	16	58	9	10	....	681	**2,355**	6	23	....	....	4	**33**	108	1	127	2	18	215	**471**	**2,859**
Pennsylvania (bituminous)	1,788	540	1,285	6	....	....	8	35	....	69	82	129	26	1	946	**4,915**	3	6	....	....	....	**9**	74	15	66	....	49	168	**372**	**5,296**
Tennessee	145	13	78	2	....	....	1	....	....	4	10	14	....	....	27	**294**	....	....	....	....	....	**0**	17	3	4	2	....	12	**38**	**332**
Texas	34	6	17	....	....	....	....	1	....	....	1	....	....	....	11	**70**	....	....	....	....	....	**0**	....	....	1	....	9	3	**13**	**83**
Utah	55	57	44	....	....	....	....	1	....	....	1	....	1	....	204	**363**	....	....	....	....	....	**0**	9	....	10	....	6	27	**52**	**415**
Virginia	195	13	164	5	1	....	4	4	....	13	16	24	1	....	57	**497**	....	....	....	....	....	**0**	61	3	6	....	1	35	**106**	**603**
Washington	52	41	34	8	....	....	....	2	2	2	....	2	2	....	20	**165**	....	....	....	....	....	**0**	1	....	2	....	....	8	**11**	**176**
West Virginia	596	194	543	5	1	3	4	19	2	26	58	104	13	9	186	**1,763**	1	1	....	....	4	**6**	70	3	37	2	13	68	**193**	**1,962**
Wyoming	120	25	92	3	1	....	1	6	....	....	11	15	5	1	58	**338**	....	....	....	....	....	**0**	12	....	14	....	2	4	**32**	**370**
Total	6,259	2,107	5,570	329	6	10	54	230	24	212	854	645	160	22	3,376	**19,858**	22	103	15	12	62	**214**	534	35	430	13	215	929	**2,156**	**22,228**
Percentage of total	28.16	9.48	25.06	1.48	0.03	0.05	0.25	1.03	0.11	0.95	3.84	2.90	0.71	0.10	15.19	**89.34**	0.10	0.46	0.07	0.05	0.28	**0.96**	2.40	0.16	1.93	0.06	0.97	4.18	**9.70**	**100.00**

The table shows that 9,106 serious injuries and 22,228 slight injuries were reported in 1911, as compared with 2,719 deaths. Of those seriously injured many recovered sufficiently to return to work, but others were so maimed and crippled as to be useless to themselves and burdens to their families. Disregarding the enormous economic loss due to permanent injuries, it is certain that the 9,106 men seriously injured lost at least 20 days' work each, a total loss of over 182,000 days, which, at $2 per day, represents a loss of $364,000.

It will be noted, as in the case of the fatalities, that the larger part (43.57 per cent) of the serious injuries was due to falls of roof and coal. The cause of the second largest number of serious injuries was mine cars and mine locomotives, which accounted for 23.93 per cent of the total.

As each of the slight injuries caused the loss of from 1 to 20 days' work, it is probably fair to assume an average loss of at least 5 days each for the 22,228 men so injured. This means a total loss of over 111,000 days' work, which, at $2 per day, represents over $222,000. Injuries caused by falls of roof and coal amounted to 37.64 per cent of the total number slightly injured, and those due to mine cars and mine locomotives amounted to 25.06 per cent.

There was a remarkable agreement between the percentage of fatalities underground and the percentage of serious and slight injuries underground. For example, in 1911, 90.95 per cent of the fatalities occurred underground, as did 89.13 per cent of the serious injuries and 89.34 per cent of the slight injuries.

In summing up the economic loss due to all three classes of accidents in 1911 it may be assumed that the value of each life lost was at least $5,000. This assumption would make the 2,719 fatalities in that year represent a loss of $13,595,000, which, added to the economic loss represented by the nonfatal accidents, would total $14,142,000. This figure, of course, does not include expenses incident to the care and treatment of the persons killed or injured, nor does it embrace the enormous loss due to the damage done to the mines and the mine equipment by these accidents.

In the same way, if it be assumed that each of the 33,617 lives lost in coal mines of the United States in the 17 years from 1896 to 1912 represented the loss of $5,000, the total loss occasioned by such fatal accidents was over $168,000,000.

THE MORE DISASTROUS COAL-MINE ACCIDENTS IN THE UNITED STATES.

Table 7 lists in chronological order the more disastrous fatal accidents in the coal mines of the United States since the beginning of the coal-mining industry in this country. Effort has been made to make the list as complete as possible from a careful examination

of available records. Only those accidents are included that caused the death of five or more persons.

Acknowledgment is made of data received from S. Sanford, engineer, and of aid in the compilation of the table from W. W. Adams, of the Bureau of Mines. The table follows:

TABLE 7.—*Coal-mine accidents in the United States in which five or more men were killed.*

Date.		Name of mine.	Location of mine.	Nature of accident.	Killed.
1839	Mar. 18	Black Heath	Near Richmond, Va.	Mine explosion	40
1854	.....	Chesterfield	....do	....do	19
1855	.....	Midlothian	....do	....do	55
1869	Sept. 6	Avondale	Plymouth, Pa.	Mine fire	179
1870	Mar. 22	Potts	Potts Mine, Pa.	Explosion of breaker boilers.	5
1870	Aug. 10	Heins & Glassmire	Middleport, Pa.	Cage fell down shaft	9
1870	Aug. 29	Preston No. 3	Girardville, Pa.	Fell down slope	7
1871	May 27	West Pittston	West Pittston, Pa.	Smoke from burning breaker.	20
1871	Oct. 2	Otto Red Ash	Branch Dale, Pa.	Mine explosion	5
1873	June 10	Henry Clay	Shamokin, Pa.	....do	10
1876	May 20	Midlothian	Coalfield, Va.	....do	8
1876	July 24	Black Diamond	Nortonville, Cal.	....do	6
1877	May 9	Wadesville	Wadesville, Pa.	....do	7
1878	Jan. 15	Potts	Locust Dale, Pa.	....do	5
1878	Nov. 21	Sullivan	Sullivan, Ind.	....do	8
1879	May 6	Audenried	Audenried, Pa.	Mine fire	6
1879	Nov. 2	Mill Creek	Mill Creek, Pa.	Mine explosion	5
1880	May 3	Lykens Valley	Shamokin, Pa.	....do	5
1881	Feb. 10	Robbins	Robbins, Ohio	....do	6
1881	Mar. 4	Almy	Almy, Wyo.	....do	38
1882	Feb. 3	Midlothian	Coalfield, Va.	....do	32
1882	May 24	Kohinoor	Shenandoah, Pa.	....do	5
1883	Jan. 9	Coulterville	Coulterville, Ill.	....do	10
1883	Feb. 16	Diamond	Braidwood, Ill.	Inrush of surface water into workings.	69
1884	Jan. 24	Crested Butte	Crested Butte, Colo.	Mine explosion	59
1884	Feb. 20	West Leisenring	West Leisenring, Pa.	....do	19
1884	Mar. 13	Laurel	Pocahontas, Va.	....do	112
1884	Aug. 21	Buck Ridge	Shamokin, Pa.	Mine fire	7
1884	Oct. 27	Youngstown	Uniontown, Pa.	Mine explosion	14
1885	Apr. 6	Cuyler	Raven Run, Pa.	Fall of roof	10
1885	Aug. 11	West End	Mocanaqua, Pa.	Gas from boiler fires in mine.	10
1885	Oct. 21	Plymouth No. 2	Plymouth, Pa.	Mine explosion	6
1885	Dec. 18	Nanticoke No. 1	Nanticoke, Pa.	Buried by inrush of quicksand.	26
1886	Jan. 13	Almy No. 4	Almy, Wyo.	Mine explosion	13
1886	Jan. 21	Newburg	Newburg, W. Va.	....do	39
1886	Aug. 30	Fair Lawn	Scranton, Pa.	....do	6
1886	Sept. 13	Marvine	....do	Suffocated by inrush of mine gas.	8
1886	Nov. 26	Conyngham	Wilkes-Barre, Pa.	Mine explosion	12
1887	Apr. 27	Tunnel	Ashland, Pa.	Suffocated by inrush of mine gas.	5
1887	Oct. 1	Bast	Big Mine Run, Pa.	....do	5
1888	Mar. 29	Keith & Perry No. 6	Rich Hill, Mo.	Mine explosion	26
1888	Nov. 3	Kettle Creek	Clinton County, Pa.	Powder and coal dust explosion.	17
1888	Nov. 9	Shaft No. 2	Frontenac, Kans.	Mine explosion	40
1889	May 9	Kaska William	Middleport, Pa.	Mine car fell on men in cage.	10
1889	Sept. 9	White Ash	Jefferson County, Colo.	Inrush of water from old shaft.	10
1890	Feb. 1	Nottingham	Plymouth, Pa.	Mine explosion	8
1890	Mar. 3	Shaft No. 3	South Wilkes-Barre, Pa.	....do	8
1890	Apr. 2	Susquehanna No. 4	Nanticoke, Pa.	....do	5
1890	May 15	Jersey No. 8	Ashley, Pa.	....do	26
1890	June 16	Hill Farm	Dunbar, Pa.	Mine fire	31
1891	Jan. 27	Mammouth	Mount Pleasant, Pa.	Mine explosion	109
1891	Feb. 4	Spring Mountain No. 1	Jeanesville, Pa.	Drowned by inrush of water from abandoned workings and asphyxiated by gas from fire built by imprisoned men.	13
1891	Oct. 23	Richardson	Glencarbon, Pa.	Imprisoned by rush of coal and suffocated by mine gas.	7
1891	Nov. 8	Susquehanna No. 1	Nanticoke, Pa.	Mine explosion	12

TABLE 7.—*Coal-mine accidents in the United States in which five or more men were killed*—Continued.

Date.	Name of mine.	Location of mine.	Nature of accident.	Killed.
1892 Jan. 7	No. 11	Krebs, Okla	Mine explosion	100
1892 Apr. 20	Lytle	Minersville, Pa	Drowned by water from old workings.	10
1892 May 10	Roslyn	Roslyn, Wash	Mine explosion	45
1892 July 23	York Farm	Pottsville, Pa	do	15
1893 Jan. 10	Como	King, Colo	do	24
1893 Feb. 14	Chicago and Iowa	Albia, Iowa	do	8
1893 Apr. 1	Neilson	Shamokin, Pa	Mine fire	10
1893 June 22	Susquehanna No. 1	Nanticoke, Pa	Mine explosion	5
1893 Sept. 21	Lance No. 11	Plymouth, Pa	do	6
1894 Feb. 13	Gaylord	do	Fall of roof	13
1894 July 17	East Sugar Loaf	Stockton, Pa	Dynamite explosion	8
1894 Aug. 24	Franklin	Franklin, Wash	Mine fire	37
1894 Oct. 8	Luke Fidler	Shamokin, Pa	do	5
1894 Oct. 11	Henry Clay	do	Boiler explosion	6
1894 Nov. 20	Blanche	Standard, W. Va	Powder and coal-dust explosion.	8
1895 Jan. 22	Tate	Sturgis, Ky	Powder or mine explosion.	5
1895 Feb. 18	West Bear Ridge	Mahanoy Plane, Pa	Mine explosion	5
1895 Feb. 27	White Ash	Cerrillos, N. Mex	do	24
1895 Mar. 20	Red Canyon	Red Canyon, Wyo	do	60
1895 Apr. 8	Blue Canyon	Lake Whatcom, Wash	do	23
1895 Oct. 7	Dorrance	Wilkes-Barre, Pa	do	7
1895 Dec. 19	Cumnock	Cumnock, N. C	do	39
1895 Dec. 20	Nelson	Dayton, Tenn	do	25
1896 Feb. 18	Vulcan	New Castle, Colo	do	49
1896 Mar. 23	Berwind	Dubois, Pa	do	13
1896 June 28	Twin	Pittston, Pa	Fall of roof	58
1896 Oct. 29	Shaft No. 3	South Wilkes-Barre, Pa	Mine explosion	6
1896 Dec. 26	Oswalt	Princeton, Ind	do	7
1897 Jan. 4	No. 1	Alderson, Okla	do	5
1897 Jan. 13	Wadesville	Wadesville, Pa	Crosshead fell down shaft.	5
1897 Sept. 3	Sunshine	Sunshine, Colo	Mine explosion	12
1897 Sept. 28	Jermyn No. 1	Rendham, Pa	Mine fire	5
1897 Oct. 30	Von Storch	Scranton, Pa	do	6
1898 May 26	Kaska William	Middleport, Pa	Drowned by water from old workings.	6
1898 Sept. 23	Umpire	Brownsville, Pa	Mine explosion	8
1898 Oct. 1	Midvale	Wilkes-Barre, Pa	Mine fire	5
1898 Nov. 5	Exeter	West Pittston, Pa	Mine car fell on men in cage.	9
1899 Apr. 21	Cook & White	Madrid, N. Mex	Mine explosion	5
1899 May 23	Cumnock	Cumnock, N. C	do	23
1899 July 24	Grindstone	Grindstone, Pa	do	5
1899 Dec. 9	Carbon Hill No. 7	Carbonado, Wash	do	31
1899 Dec. 23	Sumner	Sumner, Pa	do	19
1900 Mar. 6	Red Ash	Red Ash, W. Va	do	46
1900 May 1	Winter Quarters 1 and 4.	Scofield, Utah	Powder and mine explosion.	200
1900 Aug. 21	Issaquah No. 4	Issaquah, Wash	Smoke from burning air shaft.	5
1900 Nov. 2	Berryburg	Berryburg, W. Va	Powder smoke explosion	15
1900 Nov. 9	Buck Mountain	Mahanoy, Pa	Mine explosion	7
1901 Feb. 25	Diamondville No. 1	Diamondville, Wyo	Mine fire	28
1901 Apr. 29	McAlester No. 5	Alderson, Okla	Blown-out or windy shot	6
1901 May 15	Chatham	Farmington, W. Va	Mine explosion	10
1901 May 27	Richland	Dayton, Tenn	do	20
1901 June 10	Port Royal No. 2	Port Royal, Pa	do	19
1901 Sept. 16	Spring Gulch	Spring Gulch, Colo	do	6
1901 Oct. 25	Buttonwood	Plymouth, Pa	do	6
1901 Oct. 26	Diamondville	Diamondville, Wyo	do	22
1901 Nov. 14	Pocahontas	Pocahontas, Va	Mine fire and explosion	9
1901 Nov. 22	do	do	Mine fire	8
1901 Dec. 28	No. 1	Hartshorne, Okla	Fell from cage	6
1902 Jan. 13	Milby & Dow	Dow, Okla	Mine fire	10
1902 Jan. 24	Lost Creek No. 2	Oskaloosa, Iowa	Mine explosion	20
1902 Mar. 6	Catsburg	Monongahela, Pa	do	5
1902 Mar. 31	Nelson	Dayton, Tenn	do	16
1902 May 19	Fraterville	Coal Creek, Tenn	do	184
1902 July 10	Rolling Mill	Johnstown, Pa	do	112
1902 Aug. 7	Bowen	Bowen, Colo	Powder and mine explosion.	13
1902 Sept. 15	Algoma No. 7	Algoma, W. Va	Mine explosion	17
1902 Sept. 22	Stafford	Stafford, W. Va	do	6
1902 Oct. 1	Lawson	Lawson, Wash	do	11
1902 Nov. 29	Luke Fidler	Shamokin, Pa	do	7
1902 Dec. 9	South Wilkes-Barre	South Wilkes-Barre, Pa	Dynamite explosion	5
1903 Mar. 15	Cardiff	Cardiff, Ill	Mine explosion	5
1903 Mar. 23	Athens No. 2	Athens, Ill	Windy shot	6
1903 Mar. 31	Sandoval	Sandoval, Ill	Blown-out shot	8

TABLE 7.—*Coal-mine accidents in the United States in which five or more men were killed*—Continued.

Date.	Name of mine.	Location of mine.	Nature of accident.	Killed.
1903 Apr. 12	Central Slope 77	Carbon, Okla	Mine explosion	6
1903 June 19	Blossburg No. 3	Blossburg, N. Mex	....do	5
1903 June 30	Hanna No. 1	Hanna, Wyo	Mine explosion and fire	169
1903 Nov. 21	Ferguson	Connellsville, Pa	Mine explosion	17
1904 Jan. 25	Harwick	Cheswick, Pa	....do	179
1904 Jan. 30	Maple Hill	Mahanoy City, Pa	Dynamite explosion	5
1904 Apr. 20	Stearns No. 5	Stearns, Ky	Mine explosion	5
1904 May 5	Lance	Plymouth, Pa	Dynamite explosion	5
1904 ...do.....	Locust Gap	Locust Gap, Pa	Mine fire	5
1904 May 11	Big Muddy	Herrin, Ill	Powder explosion	10
1904 May 25	Williamstown	Williamstown, Pa	Suffocated by gases from locomotive.	10
1904 Oct. 28	Tercio	Tercio, Colo	Mine explosion	19
1904 Nov. 2	Auchincloss	Nanticoke, Pa	Fell down shaft	10
1904 Dec. 7	No. 5	Burnett, Wash	Mine explosion	17
1905 Jan. 16	Decatur	Decatur, Ill	Mine fire	6
1905 Feb. 18	Lytle	Pottsville, Pa	Fall of roof	5
1905 Feb. 20	Virginia City	Virginia City, Ala	Mine explosion	108
1905 Feb. 26	Grapevine	Wilcoe, W. Va	Powder and mine explosion.	6
1905 Mar. 9	Clear Spring	West Pittston, Pa	Fell down shaft	7
1905 Mar. 18 / Mar. 19	Rush Run and Red Ash	Red Ash, W. Va	Mine explosion	24
1905 Mar. 22	Oswald	Princeton, Ind	Powder and mine explosion.	9
1905 Apr. 3	Leiter	Zeigler, Ill	Mine explosion	49
1905 Apr. 20	Cabin Creek	Kayford, W. Va	Powder explosion	6
1905 Apr. 26	Conyngham	Wilkes-Barre, Pa	Fell down shaft	10
1905 Apr. 27	Eleanora	Dubois, Pa	Mine explosion	13
1905 Apr. 30	No. 19	Wilburton, Okla	....do	13
1905 July 6	Fuller	Searight, Pa	....do	6
1905 Oct. 13	Clyde	Fredericktown, Pa	Mine fire	6
1905 Oct. 29	Hazel Kirk No. 2	Monongahela, Pa	Mine explosion	5
1905 Nov. 4	Tidewater	Vivian, W. Va	Powder and mine explosion.	7
1905 Nov. 15	Braznell	Bentleysville, Pa	Mine explosion	7
1905 Dec. 1	Diamondville No. 1	Diamondville, Wyo	....do	18
1905 Dec. 4	Horton	Horton, W. Va	Mine fire	7
1906 Jan 4	Coaldale	Coaldale, W. Va	Mine explosion	22
1906 Jan. 18	Detroit	Detroit, W. Va	....do	18
1906 Jan. 24	Poteau No. 6	Witteville, Okla	Dynamite explosion	14
1906 Feb. 8	Parral	Parral, W. Va	Mine explosion	23
1906 Feb. 19	Maitland	Walsenburg, Colo	....do	14
1906 Feb. 27	Little Cahaba	Piper, Ala	....do	12
1906 Mar. 22	Century No. 1	Century, W. Va	Powder and mine explosion.	23
1906 Apr. 22	Cuatro	Tercio, Colo	Mine explosion	19
1906 May 15	Shenandoah City	Shenandoah, Pa	Dynamite explosion	7
1906 June 7	Red Lodge	Red Lodge, Mont	Mine fire	8
1906 Aug. 6	Susquehanna No. 7	Nanticoke, Pa	Mine explosion	6
1906 Oct. 3	Pocahontas	Pocahontas, Va	....do	35
1906 Oct. 5	Dutchman	Blossburg, N. Mex	....do	10
1906 Oct. 24	Rolling Mill	Johnstown, Pa	....do	7
1906 Nov. 3	San Toy No. 1	Corning, Ohio	Fell down shaft	5
1906 Dec. 20	Fidelity No. 1	Stone City, Kans	Powder explosion	7
1906 Dec. 22	Breese-Trenton	Breese, Ill	Cage with men fell down shaft.	6
1907 Jan. 14	Deering No. 7	Clinton, Ind	Powder explosion	7
1907 Jan. 23	Primero	Primero, Colo	Mine explosion	24
1907 Jan. 26	Lorentz	Penco, W. Va	Powder explosion	12
1907 Jan. 29	Johnston City	Johnston City, Ill	....do	7
1907 ...do.....	Stuart	Stuart, W. Va	Mine explosion	84
1907 Feb. 4	Thomas No. 25	Thomas, W. Va	Mine explosion	25
1907 Mar. 2	Holden	Taylor, Pa	....do	7
1907 Mar. 16	Bond and Bruce	Tacoma, Va	....do	11
1907 Apr. 26	Morgon	Black Diamond, Wash	....do	7
1907 May 1	Whipple	Scarboro, W. Va	....do	16
1907 May 19	Engleville	Engleville, Colo	Mine fire	5
1907 June 18	Johnson No. 1	Priceburg, Pa	Mine explosion	7
1907 Aug. 17	Sonman	Sonman, Pa	Fell down shaft	5
1907 Dec. 1	Naomi	Fayette City, Pa	Mine explosion	34
1907 Dec. 6	Monongah Nos. 6 and 8	Monongah, W. Va	....do	361
1907 Dec. 16	Yolande	Yolande, Ala	....do	56
1907 Dec. 19	Darr	Jacobs Creek, Pa	....do	239
1907 Dec. 31	Bernal	Carthage, N. Mex	....do	11
1908 Jan. 30	Backman	Hawks Nest, W. Va	....do	9
1908 Feb. 10	Moody	South Carrollton, Ky	Blown-out shot	9
1908 Mar. 28	Hanna No. 1	Hanna, Wyo	Mine explosion	59
1908 May 12	Mount Lookout	Wyoming, Pa	....do	12
1908 May 13	Prospect	Midvale, Pa	Fall of roof	5

TABLE 7.—*Coal-mine accidents in the United States in which five or more men were killed*—Continued.

Date.	Name of mine.	Location of mine.	Nature of accident.	Killed.
1908 July 15	Williamstown	Williamstown, Pa	Powder explosion	6
1908 Aug. 26	Hailey-Ola No. 1	Haileyville, Okla	Mine fire	29
1908 Aug. 28	Warrior Run	Wilkes-Barre, Pa	Mine cars	6
1908 Nov. 20	Red Lodge	Red Lodge, Mont	Mine fire	9
1908 Nov. 28	Rachel and Agnes	Marianna, Pa	Mine explosion	154
1908 Dec. 29	Lick Branch	Switchback, W. Va	do	50
1909 Jan. 10	Zeigler	Zeigler, Ill	Mine fire and explosion	26
1909 Jan. 12	Lick Branch	Switchback, W. Va	Mine explosion	67
1909 Jan. 19	Stone Canyon	Chancellor, Cal	do	6
1909 Jan. 25	Washington No. 5	Franklin, Md	Mine cars	5
1909 ...do....	Orenda No. 2	Boswell, Pa	Mine explosion	5
1909 Feb. 2	Short Creek	Short Creek, Ala	do	16
1909 Mar. 2	No. 14	Pittston, Pa	do	8
1909 Mar. 20	Sunnyside	Evansville, Ind	do	6
1909 Mar. 31	Echo	Buery, W. Va	Dynamite explosion	6
1909 Apr. 9	Eureka No. 37	Windber, Pa	Dynamite and mine explosion.	7
1909 June 23	Lackawanna No. 4	Wehrum, Pa	Mine explosion	21
1909 July 6	Toller	Tollerville, Colo	do	9
1909 Oct. 3	Northwestern	Roslyn, Wyo	do	10
1909 Oct. 21	Rock Island No. 8	Hartshorne, Okla	do	10
1909 Oct. 31	Franklin No. 2	Johnstown, Pa	do	13
1909 Nov. 9	Auchincloss	Kingston, Pa	Mine fire	9
1909 Nov. 13	St. Paul No. 2	Cherry, Ill	do	256
1909 Dec. 11	Baker No. 5	Clay, Ky	Mine explosion	7
1909 Dec. 23	Mine A	Herrin, Ill	do	8
1910 Jan. 11	Nottingham	Wilkes-Barre, Pa	do	7
1910 Jan. 31	Primero	Primero, Colo	do	75
1910 Feb. 1	Browder	Browder, Ky	Powder and mine explosion.	34
1910 Feb. 5	Ernest No. 2	Ernest, Pa	Mine explosion	12
1910 Feb. 8	Barthell No. 1	Stearns, Ky	do	6
1910 Mar. 12	South Wilkes-Barre No. 5	Wilkes-Barre, Pa	do	7
1910 Mar. 31	Great Western No. 2	Wilburton, Okla	do	6
1910 Apr. 20	Mulga	Mulga, Ala	do	40
1910 Apr. 21	Amsterdam	Amsterdam, Ohio	do	15
1910 May 5	Palos No. 3	Palos, Ala	do	83
1910 Oct. 3	Roslyn No. 4	Roslyn, Wash	do	10
1910 Oct. 8	Starkville	Starkville, Colo	do	56
1910 Nov. 3	Yolando No. 1	Tuscalum, Ala	do	5
1910 Nov. 6	Lawson	Black Diamond, Wash	do	16
1910 Nov. 8	Victor American No. 3	Delagua, Colo	Mine fire and explosion	79
1910 Nov. 11	Shoal Creek No. 1	Panama, Ill	Mine explosion	6
1910 Nov. 25	Providence No. 3	Providence, Ky	Powder and mine explosion.	10
1910 Dec. 14	Greeno	Tacoma, Va	Mine explosion	8
1910 ...do....	Leyden	Leyden, Colo	Mine fire	10
1910 Dec. 31	Lick Fork	Thacker, W. Va	Mine cars	10
1911 Jan. 20	Carbon Hill	Carbon Hill, Va	Mine explosion	5
1911 Feb. 9	Cokedale	Trinidad, Colo	do	17
1911 Mar. 18	No. 16	Mineral, Kans	do	5
1911 Mar. 22	Hazel	East Canonsburg, Pa	Fall of roof	9
1911 Apr. 7	Price-Pancoast	Throop, Pa	Mine fire	73
1911 Apr. 8	Banner	Littleton, Ala	Mine explosion	128
1911 Apr. 24	Ott No. 20	Elk Garden, W. Va	do	23
1911 May 11	Boston	Larksville, Pa	Mine fire	5
1911 May 27	Cameron	Shamokin, Pa	Mine explosion	5
1911 July 13	Sykesville	Sykesville, Pa	do	21
1911 Aug. 1	Standard-Pocahontas	Dixopoca, W. Va	do	6
1911 Sept 12	Marvin	Scranton, Pa	Mine cars	5
1911 Oct. 3	Drifton No. 2	Freeland, Pa	Cave-in	5
1911 Oct. 23	O'Gara No. 9	Harrisburg, Ill	Mine explosion	8
1911 Nov. 9	Adrian	Punxsutawney, Pa	do	8
1911 Nov. 18	Bottom Creek	Vivian, W. Va	do	18
1911 Dec. 9	Cross Mountain	Briceville, Tenn	do	84
1912 Jan. 9	Parrish	Plymouth, Pa	do	6
1912 Jan. 16	Carbon Hill	Carbon Hill, Va	Dynamite explosion	5
1912 Jan. 19	Central	Central City, Ky	Mine explosion	5
1912 Jan. 20	Kemmerer No. 4	Kemmerer, Wyo	do	6
1912 Feb. 22	Western No. 5	Lehigh, Okla	Mine fire	9
1912 Mar. 20	San Bois No. 2	McCurtain, Okla	Mine explosion	73
1912 Mar. 26	Jed	Jed, W. Va	do	81
1912 Apr. 21	Coil	Madisonville, Ky	do	5
1912 June 18	Hastings	Hastings, Colo	do	12
1912 July 11	Panama	Moundsville, W. Va	do	8
1912 July 16	Old Dominion No. 1	Carbon Hill, Va	do	8
1912 July 24	Superba	Evans Station, Pa	Cloudburst flooded mine	15
1912 Aug. 13	Abernant	Abernant, Ala	Mine explosion	18

The year having the worst record for large accidents was 1907, when 918 men were killed by accidents that caused the death of five or more men each. Since the organization of the Bureau of Mines in 1910 the total number of deaths due to accidents of this magnitude has shown a steady decrease. In 1910 the deaths from such accidents were 495, in 1911 they were 425, and in 1912 only 251. The greatest two disasters during 1912—at the San Bois No. 2 mine, McCurtain, Okla., and at the Jed mine, Jed, W. Va.—were mine explosions.

Table 8 shows that the 275 accidents listed separately in Table 7 resulted in the death of 6,777 men, an average of 24.6 for each accident. Of these accidents there were 135 that killed from 5 to 9 men each, a total of 859; 82 that killed from 10 to 24 men each, a total of 1,237; 25 that killed from 25 to 49 men each, a total of 870; 18 that killed from 50 to 99 men each, a total of 1,221; 11 that killed from 100 to 199 men each, a total of 1,534; 3 that killed from 200 to 299 men each, a total of 695, and 1 that killed 361 men.

Gas and coal-dust explosions caused 183 accidents and 5,111 deaths, or over three-fourths of the total number of men killed. The next greatest number of deaths was from mine fires, which caused the loss of 1,082 lives, or over 15 per cent of the total number killed, by 33 separate accidents. It may thus be seen that accidents from gas and coal-dust explosions and mine fires account for more than 90 per cent of the total number of men killed in these large accidents. The third largest number of men killed was by explosives, 159 men losing their lives in 21 accidents due to this cause. Next in order of importance come disasters from inrushes of water, by which 123 men lost their lives in 6 separate accidents. Accidents due to falls of roof and coal, which occasion nearly half of the total number of deaths in the coal mines of this country each year, are relatively unimportant in the enumeration of the major disasters, only 105 men losing their lives from this cause out of a total of 6,777.

TABLE 8.—*Coal-mine accidents in the United States in which five or more were killed, classified according to cause and number killed.*

Accidents resulting in—	Gas and coal-dust explosions.		Mine fires.		Explosives.		Inrush of water.		Falls of roof and coal.		Mine cars and locomotives.		Shaft accidents.		Other causes.		Total.	
	Number of separate accidents.	Total number killed.	Number of separate accidents.	Total number killed.	Number of separate accidents.	Total number killed.	Number of separate accidents.	Total number killed.	Number of separate accidents.	Total number killed.	Number of separate accidents.	Total number killed.	Number of separate accidents.	Total number killed.	Number of separate accidents.	Total number killed.	Number of separate accidents.	Total number killed.
5 to 9 deaths	76	485	19	125	17	108	1	6	4	24	3	16	9	59	6	36	135	859
10 to 24 deaths	62	1,005	4	50	4	51	4	48	2	23	1	10	3	30	2	20	82	1,237
25 to 49 deaths	19	693	5	151	....	....	....	....	....	....	....	....	....	....	1	26	25	870
50 to 99 deaths	14	942	2	152	....	....	1	69	1	58	....	....	....	....	....	....	18	1,221
100 to 199 deaths	9	1,186	2	348	....	....	....	....	....	....	....	....	....	....	....	....	11	1,534
200 to 299 deaths	2	439	1	256	....	....	....	....	....	....	....	....	....	....	....	....	3	695
300 deaths and over	1	361	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	361
5 or more deaths	183	5,111	33	1,082	21	159	6	123	7	105	4	26	12	89	9	82	275	6,777

COMPARATIVE STATISTICS OF FATAL ACCIDENTS IN THE COAL MINES, METAL MINES, AND QUARRIES IN THE UNITED STATES DURING THE CALENDAR YEAR 1911.

Table 9 shows the number of men employed, the number of men killed, and the death rate per 1,000 employed in the coal mines as compared with the metal mines of the United States. Although the number of men killed in the metal mines was 695 as compared with 2,719 men killed in the coal mines, the death rate per 1,000 employed in the metal mines was 4.19 as against 3.73 for the coal mines. These figures do not, however, take into account the fact that the coal mines were operated an average of only 220 days in the year against an average of 282 days for the metal mines. If the death rate per 1,000 employed is calculated on the basis of a year of 300 working days, it will be seen that the rate for the coal mines (5.09) exceeds that for mines other than coal (4.45), as shown in Table 10. The latter table also shows that when calculated on a basis of 300 working days the death rate per 1,000 employed in coal mines is only exceeded by the death rate in copper mines (5.19).

TABLE 9.—*Comparative statistics of fatal accidents in the coal and metal mines in the United States in the calendar year* ***1911.***

State.	Number employed.		Total number killed.		Number killed per 1,000 employed.	
	Coal mines.	Metal mines.[a]	Coal mines.	Metal mines.[a]	Coal mines.	Metal mines.[a]
Alabama	22,003	4,101	209	10	9.50	2.44
Arkansas	5,338	584	12	2	2.25	3.42
Arizona	.....	12,768	.....	70	.....	5.48
California	[b] 60	10,877	0	38	.00	3.49
Connecticut	.....	164	.....	0	.....	.00
Colorado	14,373	10,404	91	43	6.33	4.13
Florida	.....	4,305	.....	9	.....	2.09
Georgia	510	1,001	0	2	.00	2.00
Idaho	9	4,801	0	23	.00	4.79
Illinois	75,656	848	172	1	2.27	1.18
Indiana	20,991	4	46	0	2.19	.00
Iowa	16,852	244	40	1	2.37	4.10
Kansas	11,823	729	42	2	3.55	2.74
Kentucky	24,124	461	45	3	1.87	6.51
Maine	.....	81	.....	0	.....	.00
Maryland	6,079	231	15	0	2.47	.00
Massachusetts	.....	118	.....	0	.....	.00
Michigan	3,248	31,584	7	134	2.16	4.24
Minnesota	.....	16,548	.....	76	.....	4.59
Missouri	9,607	9,901	8	38	8.33	3.83
Montana	3,864	13,346	13	62	3.36	4.65
Nevada	.....	6,210	.....	50	.....	8.05
New Hampshire	.....	100	.....	0	.....	.00
New Jersey	.....	1,739	.....	23	.....	13.23
New Mexico	3,700	2,450	21	11	5.68	4.49
New York	.....	3,202	.....	10	.....	3.12
North Carolina	.....	997	.....	4	.....	4.01
North Dakota	760	.....	1	.....	1.32	.....
Ohio	45,459	362	109	0	2.40	.00
Oklahoma	8,729	418	33	0	3.78	.00
Oregon	304	1,394	1	2	3.29	1.43
Pennsylvania	345,048	862	1,239	1	3.59	1.16
South Carolina	.....	984	.....	0	.....	.00
South Dakota	.....	2,519	.....	8	.....	3.18
Tennessee	11,124	4,454	115	10	10.34	2.25
Texas	4,980	248	8	0	1.61	.00
Utah	3,446	7,710	14	49	4.06	6.36
Vermont	.....	180	.....	0	.....	.00
Virginia	8,107	3,971	68	6	8.39	1.51
Washington	7,236	1,569	27	3	3.73	1.91
West Virginia	66,800	54	350	1	5.24	18.52
Wisconsin	.....	2,844	.....	3	.....	1.05
Wyoming	8,118	612	33	0	4.07	.00
Total	728,348	165,979	2,719	695	.....	.....
Average	.....	.....	.....	.....	3.73	4.19

[a] Fay, A. H., Metal-mine accidents in the United States during the calendar year 1911: Technical Paper 40, Bureau of Mines, p. 16. Includes 329 mines for nonmetals, such as phosphate, gypsum, salt, barite, fluorspar, mica, etc., employing 13,893 men.
[b] Includes Alaska.

TABLE 10.—*Comparison of the number killed per 1,000 employed in and about the mines and quarries of the United States in the calendar year* ***1911****, with reference to the number of days worked.*

Kind of mine.	Number employed.	Number killed.	Number of days worked.	Number of men killed per 1,000 employed.	
				Actual-time basis.	300-day basis.
Coal	728,348	2,719	220	3.73	5.09
Copper[a]	44,693	238	308	5.33	5.19
Iron[a]	45,953	197	277	4.29	4.65
Gold, silver, and miscellaneous metal[a]	48,919	193	276	3.95	4.30
Lead and zinc (Mississippi Valley)[a]	12,521	43	256	3.36	3.93
Nonmetal[a]	13,893	24	258	1.73	2.01
All mines (except coal)[a]	165,979	695	282	4.19	4.45
Quarries[a]	110,954	188	228	1.69	2.22

[a] Fay, A. H., Quarry accidents in the United States during the calendar year 1911. Technical Paper 46, Bureau of Mines.

MORTALITY FROM ACCIDENTS AND DISEASES AMONG COAL MINERS AS COMPARED WITH THAT AMONG PERSONS ENGAGED IN OTHER INDUSTRIES.

Tables 11 and 12, compiled from published records of the Prudential Insurance Co. of America,[a] show the causes of mortality among coal miners and various other industrial workers and give the percentage of deaths by principal causes. Table 11 indicates that the percentage of deaths from accidents and from pneumonia and other respiratory diseases is larger for coal miners than for any other class of workers, and that there is a relatively small percentage of deaths among coal miners from tuberculosis. In Table 12, which shows the causes of mortality in different branches of mining, it will be seen that both the percentage of deaths due to accidents and the percentage of deaths from tuberculosis and pneumonia among the metal miners is greater than among coal miners. Among the copper miners the percentage of deaths due to accidents is lower than in the case of coal miners, but the percentage of deaths due to tuberculosis and pneumonia is much higher. The tables follow.

TABLE 11.—*Principal causes of mortality in different occupations.*

Occupation.	Cause of death.						
	Accidents.	Tuberculosis.	Pneumonia and other respiratory diseases.	Urinary diseases.	Apoplexy, paralysis, and other nervous diseases.	Heart disease.	All other causes.
	Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
Coal miners	22.9	11.1	20.7	8.0	7.7	6.8	22.8
Iron and steel workers	15.3	19.4	12.5	9.9	10.0	8.8	24.1
Machinists	10.0	27.7	10.4	10.0	9.1	8.7	24.1
Masons	9.0	17.7	13.4	13.0	10.1	10.1	26.7
Painters	8.6	23.8	9.9	15.1	10.7	8.1	23.8
Carpenters	7.8	16.1	11.1	13.4	13.6	11.4	26.6
Textile workers	7.0	28.4	12.4	11.5	9.4	9.1	22.2
Clerks	6.7	36.7	10.3	9.6	8.1	7.9	20.7
Farmers	5.8	10.2	11.9	12.9	17.1	12.7	29.4

TABLE 12.—*Principal causes of deaths among coal and metal miners (ages 25 to 64).*

Occupation.	Cause of death.		
	Accidents.	Tuberculosis and pneumonia.	All other causes.
	Per cent.	*Per cent.*	*Per cent.*
Coal miners (1907–1910)	22.92	25.28	51.80
Copper miners in one of the principal copper-producing States (1907–1911)	17.06	43.45	39.49
Metal miners (1911)	30.51	31.63	37.86

[a] Exhibits of the Prudential Insurance Co. of America, International Congress of Hygiene and Demography, Washington, D. C., 1912.

STATISTICS OF COAL-MINE ACCIDENTS IN AND ABOUT THE COAL MINES OF THE UNITED STATES DURING THE CALENDAR YEARS 1896 TO 1911, INCLUSIVE, BY STATES.

Table 13 gives the number of men killed in and about the coal mines of the various States of the United States during the calendar years 1896 to 1911, inclusive, in relation to the production and the number employed.

TABLE 13.—*Number killed in and about the coal mines of the various States during the calendar years 1896 to 1911, inclusive, in relation to the production and to the number employed.*

ALABAMA.

Year.	Production (short tons).[a]	Number employed.[a]	Average number of days worked.[a]	Number killed.			Production per death (short tons).
				Total.	Per 1,000 employed.	Per million short tons mined.	
1896	5,748,697	9,894	248	28	2.83	4.87	205,000
1897	5,893,770	10,597	233	39	3.68	6.62	151,000
1898	6,535,283	10,733	250	45	4.19	6.89	145,000
1899	7,593,416	13,481	238	40	2.97	5.27	190,000
1900	8,394,275	13,967	257	37	2.65	4.41	227,000
1901	9,099,052	17,370	236	41	2.36	4.51	222,000
1902	10,354,570	16,439	256	50	3.04	4.83	207,000
1903	11,654,324	21,438	228	57	2.66	4.89	204,000
1904	11,262,046	17,811	216	83	4.66	7.37	136,000
1905	11,866,069	19,595	225	187	9.54	15.76	63,000
1906	13,107,963	20,555	237	96	4.67	7.32	137 000
1907	14,250,454	21,388	242	154	7.20	10.81	93,000
1908	11,604,593	19,197	222	108	5.63	9.31	107,000
1909	13,703,450	17,760	.....	129	7.26	9.41	106,000
1910	16,111,462	22,230	249	238	10.71	14.77	68,000
1911	15,021,421	22,003	227	209	9.50	13.91	72.000

ARKANSAS.

1896	675,374	1,507	168	1	0.66	1.48	675,000
1897	856,190	1,990	161	3	1.51	3.50	285,000
1898	1,205,479	2,555	163	5	1.96	4.15	241,000
1899	843,554	2,313	156	.....	.....	.....	.....
1900	1,447,945	2,800	219	.....	.....	.....	.....
1901	1,816,136	3,144	223	18	5.73	9.91	101,000
1902	1,943,932	3,595	188	13	3.62	6.69	150,000
1903	2,229,172	4,157	223	.....	.....	.....	.....
1904	2,009,451	4,580	165	.....	.....	.....	.....
1905	1,934,673	4,192	177	8	1.91	4.14	242,000
1906	1,864,268	4,298	165	13	3.02	6.97	143,000
1907	2,670,438	5,085	190	13	2.56	4.87	205,000
1908	2,078,357	5,337	145	14	2.62	6.74	148,000
1909	2,377,157	5,266	.....	15	2.85	6.31	158,000
1910	1,905,958	5,568	128	14	2.51	7.35	136,000
1911	2,106,789	5,338	133	12	2.25	5.70	176,000

COLORADO.

1896	3,112,400	6,704	172	68	10.14	21.85	46,000
1897	3,361,703	5,852	180	38	6.49	11.30	88,000
1898	4,076,347	6,440	220	23	3.57	5.64	177,000
1899	4,776,224	7,166	246	40	5.58	8.37	119,000
1900	5,244,364	7,459	264	31	4.16	5.91	169,000
1901	5,700,015	8,870	253	55	6.20	9.65	104,000
1902	7,401,343	8,956	261	72	8.04	9.73	103,000
1903	7,423,602	9,229	245	44	4.77	5.93	169,000
1904	6,658,355	8,123	261	95	11.70	14.27	70,000
1905	8,826,429	11,020	255	65	5.90	7.36	136,000
1906	10,111,218	11,368	268	90	7.92	8.90	112,000
1907	10,790,236	14,223	258	107	7.52	9.92	101,000
1908	9,634,973	14,523	212	63	4.34	6.54	153,000
1909	10,716,936	11,472	.....	97	8.46	9.05	110,000
1910	11,973,736	15,864	236	323	20.36	26.98	37,000
1911	10,157,383	14,373	207	91	6.33	8.96	112,000

[a] Selected from Mineral Resources U. S., 1896–1911: U. S. Geol. Survey, except the figure for the number of persons employed in 1911, which was compiled by the Bureau of Mines.

TABLE 13.—*Number killed in and about the coal mines of the various States during the calendar years 1896 to 1911, inclusive, in relation to the production and to the number employed*—Continued.

GEORGIA.

Year.	Production (short tons).	Number employed.	Average number of days worked.	Number killed.			Production per death (short tons).
				Total.	Per 1,000 employed.	Per million short tons mined.	
1896	238,546	731	[a]301	.....	.....	.....	.....
1897	195,869	520	[a]296	.....	.....	.....	.....
1898	244,187	534	[a]292	.....	.....	.....	.....
1899	233,111	637	[a]291	.....	.....	.....	.....
1900	315,557	[a]681	[a]262	.....	.....	.....	.....
1901	342,825	[a]791	[a]291	.....	.....	.....	.....
1902	414,083	[a]795	[a]312	.....	.....	.....	.....
1903	416,951	[a]730	[a]296	.....	.....	.....	.....
1904	383,191	[a]906	[a]223	.....	.....	.....	.....
1905	351,991	[a]816	[a]266	.....	.....	.....	.....
1906	332,107	737	279	.....	.....	.....	.....
1907	362,401	808	262	.....	.....	.....	.....
1908	264,822	670	261	.....	.....	.....	.....
1909	211,196	460	.....	2	4.35	9.47	106,000
1910	177,245	386	265	.....	.....	.....	.....
1911	165,330	510	[a]277	.....	.....	.....	.....

ILLINOIS.

1896	19,786,626	39,560	184	70	1.77	3.54	283,000
1897	20,072,758	33,788	185	74	2.19	3.69	271,000
1898	18,599,299	35,026	175	89	2.54	4.79	209,000
1899	24,439,019	36,756	228	73	1.99	2.99	335,000
1900	25,767,981	39,101	226	102	2.61	3.96	253,000
1901	27,331,552	41,880	220	106	2.53	3.88	258,000
1902	32,939,373	47,411	226	107	2.26	3.25	308,000
1903	36,957,104	50,596	228	158	3.12	4.28	234,000
1904	36,475,060	54,685	213	173	3.16	4.74	211,000
1905	38,434,363	58,053	201	203	3.50	5.28	189,000
1906	41,480,104	61,988	192	161	2.60	3.88	258,000
1907	51,317,146	65,581	218	192	2.93	3.74	267,000
1908	47,659,690	68,035	185	172	2.53	3.61	277,000
1909	50,904,990	69,425	.....	458	6.60	9.00	111,000
1910	45,900,246	72,645	160	143	1.97	3.12	321,000
1911	53,679,116	75,656	188	172	2.27	3.20	312,000

INDIANA.

1896	3,905,779	8,806	163	28	3.18	7.17	139,000
1897	4,151,169	8,886	176	16	1.80	3.85	259,000
1898	4,920,743	8,971	199	21	2.34	4.27	234,000
1899	6,006,523	9,712	218	17	1.75	2.83	353,000
1900	6,484,086	11,720	199	19	1.62	2.93	341,000
1901	6,918,225	12,968	194	24	1.85	3.47	288,000
1902	9,446,424	15,457	205	24	1.55	2.54	394,000
1903	10,794,692	17,017	197	52	3.06	4.82	208,000
1904	10,842,189	19,587	177	34	1.74	3.14	319,000
1905	11,895,252	25,323	151	47	1.86	3.95	253,000
1906	12,092,560	20,970	175	31	1.48	2.56	390,000
1907	13,985,713	21,022	197	53	2.52	3.79	264,000
1908	12,314,890	18,380	174	45	2.45	3.65	274,000
1909	14,834,259	20,937	.....	50	2.39	3.37	297,000
1910	18,389,815	21,878	229	51	2.33	2.77	361,000
1911	14,201,355	20,991	182	46	2.19	3.24	309,000

[a] Includes North Carolina.

TABLE 13.—*Number killed in and about the coal mines of the various States during the calendar years 1896 to 1911, inclusive, in relation to the production and to the number employed*—Continued.

IOWA.

Year.	Production (short tons).	Number employed.	Average number of days worked.	Number killed.			Production per death (short tons).
				Total.	Per 1,000 employed.	Per million short tons mined.	
1896	3,954,028	9,672	178	18	1.86	4.55	220,000
1897	4,611,865	10,703	201	23	2.15	4.99	201,000
1898	4,618,842	10,262	219	22	2.14	4.76	210,000
1899	5,177,479	10,971	229	25	2.28	4.83	207,000
1900	5,202,939	11,608	228	29	2.50	5.57	179,000
1901	5,617,499	12,653	218	29	2.29	5.16	194,000
1902	5,904,766	12,434	227	49	3.94	8.30	121,000
1903	6,419,811	14,162	226	27	1.91	4.21	238,000
1904	6,519,933	15,629	213	25	1.60	3.83	261,000
1905	6,798,609	15,113	209	37	2.45	5.44	184,000
1906	7,266,224	15,260	224	29	1.90	3.99	251,000
1907	7,574,322	15,585	230	40	2.57	5.28	189,000
1908	7,161,310	16,021	214	31	1.94	4.33	231,000
1909	7,757,762	17,286	.....	39	2.26	5.03	199,000
1910	7,928,120	16,666	218	33	1.98	4.16	240,000
1911	7,331,648	16,852	203	40	2.37	5.46	183,000

KANSAS.

1896	2,884,801	7,127	168	12	1.68	4.16	240,000
1897	3,054,012	6,639	194	7	1.05	2.29	436,000
1898	3,406,555	7,197	194	17	2.36	4.99	200,000
1899	3,852,267	8,000	226	16	2.00	4.15	241,000
1900	4,467,870	8,459	232	22	2.60	4.92	203,000
1901	4,900,528	9,928	224	11	1.11	2.24	446,000
1902	5,266,065	9,461	220	29	3.07	5.51	182,000
1903	5,839,976	10,924	215	33	3.02	5.65	177,000
1904	6,333,307	12,198	213	32	2.62	5.05	198,000
1905	6,423,979	11,926	212	41	3.44	6.38	157,000
1906	6,024,775	14,355	165	39	2.72	6.47	154,000
1907	7,322,449	12,439	225	38	3.06	5.19	193,000
1908	6,245,508	13,916	181	38	2.73	6.08	164,000
1909	6,986,478	12,359	.....	32	2.59	4.58	218,000
1910	4,921,451	12,870	148	17	1.32	3.45	289,000
1911	6,254,228	11,823	189	42	3.55	6.72	149,000

KENTUCKY.

1896	3,333,478	7,549	165	6	0.79	1.80	556,000
1897	3,602,097	7,983	178	12	1.50	3.33	300,000
1898	3,887,908	7,614	187	6	7.88	1.54	648,000
1899	4,607,255	7,461	224	7	.94	1.52	658,000
1900	5,328,964	9,680	227	17	1.76	3.19	313,000
1901	5,469,986	10,307	213	21	2.04	3.84	260,000
1902	6,766,984	13,727	209	19	1.38	2.81	356,000
1903	7,538,032	14,354	207	27	1.88	3.58	279,000
1904	7,576,482	14,235	197	20	1.40	2.64	379,000
1905	8,432,523	14,685	200	31	2.11	3.68	272,000
1906	9,653,647	15,272	212	39	2.55	4.04	248,000
1907	10,753,124	16,971	210	32	1.89	2.98	336,000
1908	10,246,553	16,996	186	40	2.35	3.90	256,000
1909	10,697,384	16,903	.....	34	2.01	3.18	315,000
1910	14,623,319	20,316	221	86	4.23	5.88	170,000
1911	13,706,839	24,124	191	45	1.87	3.28	305,000

TABLE 13.—*Number killed in and about the coal mines of the various States during the calendar years 1896 to 1911, inclusive, in relation to the production and to the number employed*—Continued.

MARYLAND.

Year.	Production (short tons).	Number employed.	Average number of days worked.	Number killed.			Production per death (short tons).
				Total.	Per 1,000 employed.	Per million short tons mined.	
1896	4,143,936	4,039	204	6	1.49	1.45	691,000
1897	4,442,128	4,719	262	5	1.06	1.13	888,000
1898	4,674,884	4,818	253	4	.83	.86	1,169,000
1899	4,807,396	4,624	275	5	1.08	1.04	961,000
1900	4,024,688	5,319	203	[a] 7	1.32	1.74	575,000
1901	5,113,127	5,333	262	[a] 12	2.25	2.35	426,000
1902	5,271,609	5,827	242	11	1.89	2.09	479,000
1903	4,846,165	5,859	219	12	2.05	2.48	404,000
1904	4,813,622	5,671	226	10	1.76	2.08	481,000
1905	5,108,539	5,948	252	15	2.52	2.94	341,000
1906	5,435,453	6,438	250	6	.93	1.10	906,000
1907	5,532,628	5,880	263	[b] 3	.....	.....	.....
1908	4,377,093	6,079	220	[c] 6	.....	.....	.....
1909	4,023,241	8,004	.....	20	2.50	4.97	201,000
1910	5,217,125	5,809	270	17	2.93	3.26	307,000
1911	4,685,795	6,079	243	15	2.47	3.20	312,000

MICHIGAN.

1896	92,882	320	157	.....	.....	.....	.....
1897	223,592	537	230	.....	.....	.....	.....
1898	315,722	715	245	.....	.....	.....	.....
1899	624,708	1,291	232	[d] 4	.....	.....	.....
1900	849,475	1,709	261	10	5.85	11.77	85,000
1901	1,241,241	2,276	247	6	2.64	4.83	207,000
1902	964,718	2,344	171	8	3.41	8.29	121,000
1903	1,367,619	2,768	222	8	2.89	5.85	171,000
1904	1,342,840	3,549	183	8	2.25	5.96	168,000
1905	1,473,211	3,696	186	9	2.44	6.11	164,000
1906	1,346,338	3,971	173	5	1.26	3.72	269,000
1907	2,035,858	3,982	234	7	1.76	3.44	291,000
1908	1,835,019	4,247	207	6	1.41	3.27	306,000
1909	1,784,692	3,496	.....	9	2.57	5.04	198.000
1910	1,534,967	3,575	211	6	1.68	3.91	256,000
1911	1,476,074	3,248	218	7	2.16	4.74	211,000

MISSOURI.

1896	2,331,542	5,982	168	8	1.34	3.43	291,000
1897	2,665,626	6,414	191	12	1.87	4.50	222,000
1898	2,688,321	6,542	198	10	1.53	3.72	269,000
1899	3,025,814	7,136	212	11	1.54	3.64	275,000
1900	3,540,103	8,180	214	19	2.32	5.37	186,000
1901	3,802,088	9,871	223	16	1.62	4.21	238,000
1902	3,890,154	9,742	202	10	1.03	2.57	389,000
1903	4,238,586	9,544	215	17	1.78	4.01	249,000
1904	4,168,308	10,137	206	11	1.09	2.64	379,000
1905	3,983,378	8,962	194	11	1.23	2.76	362,000
1906	3,758,008	9,557	185	16	1.67	4.26	235,000
1907	3,997,936	8,448	214	8	.95	2.00	500,000
1908	3,317,315	8,988	169	10	1.11	3.01	332,000
1909	3,756,530	9,188	.....	21	2.29	5.59	179,000
1910	2,982,433	9,691	154	14	1.44	4.69	213,000
1911	3,760,607	9,607	183	8	8.33	2.13	470,000

[a] From Mineral Resources, U. S.: U. S. Geol. Survey.
[b] January 1 to April 1.
[c] May 1 to December 1.
[d] June 1 to December 1.

TABLE 13.—*Number killed in and about the coal mines of the various States during the calendar years 1896 to 1911, inclusive, in relation to the production and to the number employed*—Continued.

MONTANA.

Year.	Production (short tons).	Number employed.	Average number of days worked.	Number killed.			Production per death (short tons).
				Total.	Per 1,000 employed.	Per million short tons mined.	
1896	1,543,445	2,335	234	.....	.....	.....	.....
1897	1,647,882	2,337	252	11	4.71	6.68	150,000
1898	1,479,803	2,359	216	7	2.97	4.73	211,000
1899	1,496,451	2,378	238	1	.42	.67	1,496,000
1900	1,661,775	2,376	252	7	2.95	4.21	237,000
1901	1,396,081	2,158	231	7	3.24	5.01	199,000
1902	1,560,823	1,938	270	12	6.19	7.69	130,000
1903	1,488,810	2,155	254	5	2.32	3.36	298,000
1904	1,358,919	2,505	243	9	3.59	6.62	151,000
1905	1,643,832	2,181	243	8	3.67	4.87	205,000
1906	1,829,921	2,394	243	13	5.43	7.10	141,000
1907	2,016,857	2,735	268	13	4.75	6.45	155,000
1908	1,920,190	3,146	224	21	6.68	10.94	91,000
1909	2,553,940	4,535	.....	11	2.43	4.31	232,000
1910	2,920,970	3,837	239	12	3.13	4.11	243,000
1911	2,976,358	3,864	230	13	3.36	4.37	229,000

NEW MEXICO.

1896	622,626	1,569	172	7	4.46	11.24	89,000
1897	716,981	1,659	208	7	4.22	9.76	102,000
1898	992,288	1,873	242	8	4.27	8.06	124,000
1899	1,050,714	1,750	257	18	10.29	17.13	58,000
1900	1,299,299	2,037	261	9	4.42	6.93	144,000
1901	1,086,546	2,478	224	12	4.84	11.04	91,000
1902	1,048,763	1,849	217	14	7.57	13.35	75,000
1903	1,541,781	1,789	260	22	12.30	14.27	70,000
1904	1,452,325	1,849	228	8	4.33	5.51	182,000
1905	1,649,933	2,108	234	7	3.32	4.24	236,000
1906	1,964,713	2,070	242	14	6.76	7.13	140,000
1907	2,628,959	2,970	269	31	10.44	11.79	85,000
1908	2,467,937	3,448	197	24	6.96	9.72	103,000
1909	2,801,128	3,317	.....	14	4.22	5.00	200,000
1910	3,508,321	3,585	283	16	4.46	4.56	219,000
1911	3,148,158	3,700	230	21	5.68	6.67	150,000

NORTH DAKOTA.

1896	78,050	141	166	.....	.....	.....	.....
1897	77,246	170	168	.....	.....	.....	.....
1898	83,895	151	187	.....	.....	.....	.....
1899	98,809	210	154	.....	.....	.....	.....
1900	129,883	326	142	.....	.....	.....	.....
1901	166,601	280	198	.....	.....	.....	.....
1902	266,511	402	213	.....	.....	.....	.....
1903	278,645	486	198	.....	.....	.....	.....
1904	271,928	554	192	.....	.....	.....	.....
1905	317,542	626	187	.....	.....	.....	.....
1906	305,689	488	209	.....	.....	.....	.....
1907	347,760	562	223	.....	.....	.....	.....
1908	320,742	631	181	4	6.34	12.47	80,000
1909	422,047	972	.....	0	.....	.....	.....
1910	399,041	534	207	2	3.75	5.01	200,000
1911	502,628	760	229	1	1.32	1.99	503,000

TABLE 13.—*Number killed in and about the coal mines of the various States during the calendar years 1896 to 1911, inclusive, in relation to the production and to the number employed*—Continued.

OHIO.

Year.	Production (short tons).	Number employed.	Average number of days worked.	Number killed.			Production per death (short tons).
				Total.	Per 1,000 employed.	Per million short tons mined.	
1896	12,875,202	25,500	161	43	1.69	3.34	299,000
1897	12,196,942	26,410	148	39	1.48	3.20	313,000
1898	14,516,867	26,986	169	50	1.85	3.44	290,000
1899	16,500,270	26,038	200	56	2.15	3.39	295,000
1900	18,988,150	27,628	215	71	2.57	3.74	267,000
1901	20,943,807	32,111	198	67	2.09	3.20	313,000
1902	23,519,894	38,965	200	87	2.23	3.70	270,000
1903	24,838,103	41,936	194	124	2.96	4.99	200,000
1904	24,400,220	43,634	175	118	2.70	4.84	207,000
1905	25,552,950	43,399	176	127	2.93	4.97	201,000
1906	27,731,640	45,438	167	132	2.91	4.76	210,000
1907	32,142,419	46,833	199	154	3.29	4.79	209,000
1908	26,270,639	47,407	161	115	2.43	4.38	228,000
1909	27,939,641	38,114	.....	112	2.94	4.01	249,000
1910	34,209,668	46,641	203	161	3.45	4.71	212,000
1911	30,759,986	45,459	179	109	2.40	3.54	282,000

OKLAHOMA.

1896	1,366,646	3,549	170	15	4.23	10.98	91,000
1897	1,336,380	3,168	176	27	8.52	20.20	49,000
1898	1,381,466	3,216	198	23	7.15	16.65	60,000
1899	1,537,427	4,084	212	27	6.61	17.56	57,000
1900	1,922,298	4,525	228	35	7.73	18.21	55,000
1901	2,421,781	6,706	208	57	8.50	23.54	42,000
1902	2,820,666	5,574	232	42	7.53	14.89	67,000
1903	3,517,388	7,704	247	41	5.32	11.66	86,000
1904	3,046,539	8,487	199	29	3.42	9.52	105,000
1905	2,924,427	7,712	188	41	5.32	14.02	71,000
1906	2,860,200	8,251	166	44	5.33	15.38	65,000
1907	3,642,658	8,396	216	32	3.81	8.78	114,000
1908	2,948,116	8,651	172	51	5.90	17.30	58,000
1909	3,119,377	8,689	.....	67	7.71	21.48	47,000
1910	2,646,226	8,657	144	40	4.62	15.12	66,000
1911	3,074,242	8,729	156	33	3.78	10.74	93,000

OREGON.

1896	101,721	254	191	.....	.....	.....	.....
1897	107,289	254	171	.....	.....	.....	.....
1898	58,184	199	142	.....	.....	.....	.....
1899	86,888	124	238	.....	.....	.....	.....
1900	58,864	141	273	.....	.....	.....	.....
1901	69,011	187	228	.....	.....	.....	.....
1902	65,648	265	234	.....	.....	.....	.....
1903	91,144	235	258	.....	.....	.....	.....
1904	111,540	334	149	.....	.....	.....	.....
1905	109,641	316	242	.....	.....	.....	.....
1906	79,731	209	224	.....	.....	.....	.....
1907	70,981	184	231	.....	.....	.....	.....
1908	86,259	214	249	.....	.....	.....	.....
1909	87,276	235	.....	[a] 1	4.26	11.46	87,000
1910	67,533	153	257	0	.....	.....	.....
1911	46,661	304	179	1	3.29	21.28	47,000

[a] From Mineral Resources, U. S.: U. S. Geol. Survey.

TABLE 13.—*Number killed in and about the coal mines of the various States during the calendar years 1896 to 1911, inclusive, in relation to the production and to the number employed*—Continued.

PENNSYLVANIA.

[Anthracite.]

Year.	Production (short tons).	Number employed.	Average number of days worked.	Number killed.			Production per death (short tons).
				Total.	Per 1,000 employed.	Per million short tons mined.	
1896	54,346,081	148,991	174	502	3.37	9.24	108,000
1897	52,611,680	149,884	150	423	2.82	8.04	124,000
1898	53,382,644	145,504	152	411	2.82	7.70	130,000
1899	60,418,005	139,608	173	461	3.30	7.63	131,000
1900	57,367,915	144,206	166	411	2.85	7.16	140,000
1901	67,471,667	145,309	196	513	3.53	7.60	132,000
1902	41,373,595	148,141	116	300	2.03	7.25	138,000
1903	74,607,068	150,483	206	518	3.44	6.94	144,000
1904	73,156,709	155,861	200	595	3.82	8.13	123,000
1905	77,659,850	165,406	215	644	3.89	8.29	121,000
1906	71,282,411	162,355	195	557	3.43	7.81	128,000
1907	85,604,312	167,234	220	708	4.23	8.27	121,000
1908	83,268,754	174,174	200	678	3.89	8.14	123,000
1909	81,070,359	166,801	205	567	3.40	6.99	143,000
1910	84,485,236	169,497	229	601	3.55	7.11	141,000
1911	90,464,067	173,940	246	710	4.08	7.85	127,000

[Bituminous.]

1896	49,557,453	72,625	206	180	2.48	3.63	275,000
1897	54,417,974	77,272	205	150	1.94	2.76	363,000
1898	65,165,133	79,611	229	200	2.51	3.07	326,000
1899	74,150,175	82,812	245	258	3.12	3.48	287,000
1900	79,842,326	92,692	242	265	2.86	3.32	301,000
1901	82,305,946	101,904	230	301	2.95	3.66	273,000
1902	98,574,367	112,630	248	456	4.05	4.63	216,000
1903	103,117,178	129,265	235	402	3.11	3.90	257,000
1904	97,938,287	135,100	196	536	3.97	5.47	183,000
1905	118,413,637	143,629	231	479	3.33	4.05	247,000
1906	129,293,206	152,099	231	477	3.14	3.69	271,000
1907	150,143,177	163,295	255	806	4.94	5.37	186,000
1908	117,179,527	165,961	201	572	3.45	4.88	205,000
1909	137,966,791	159,321	.....	506	3.18	3.67	273,000
1910	150,521,526	175,403	238	539	3.07	3.58	279,000
1911	144,754,163	171,108	233	529	3.09	3.65	274,000

TENNESSEE.

1896	2,663,106	6,531	211	22	3.37	8.26	121,000
1897	2,888,849	6,337	221	10	1.58	3.46	289,000
1898	3,022,896	6,643	234	19	2.96	6.29	159,000
1899	3,330,659	6,949	252	20	2.88	6.00	167,000
1900	3,509,562	7,646	242	10	1.31	2.85	351,000
1901	3,633,290	9,046	228	44	4.86	12.11	83,000
1902	4,382,968	8,750	230	226	25.83	51.56	19,000
1903	4,798,004	9,961	227	26	2.61	5.42	185,000
1904	4,782,211	10,416	217	28	2.69	5.86	171,000
1905	5,766,690	11,928	222	29	2.43	5.03	199,000
1906	6,259,275	11,452	229	32	2.79	5.11	196,000
1907	6,810,243	12,052	232	30	2.49	4.41	227,000
1908	6,199,171	11,812	209	34	2.88	5.48	182,000
1909	6,358,645	10,031	.....	29	2.89	4.56	219,000
1910	7,121,380	11,930	225	38	3.19	5.34	187,000
1911	6,433,156	11,124	232	115	10.34	17.88	56,000

TABLE 13.—*Number killed in and about the coal mines of the various States during the calendar years 1896 to 1911, inclusive, in relation to the production and to the number employed*—Continued.

TEXAS.

Year.	Production (short tons).	Number employed.	Average number of days worked.	Number killed.			Production per death (short tons).
				Total.	Per 1,000 employed.	Per million short tons mined.	
1896	544,015	1,953	187	.....	.....	.....	.....
1897	639,341	1,766	220	.....	.....	.....	.....
1898	686,734	2,130	245	.....	.....	.....	.....
1899	883,832	2,410	256	.....	.....	.....	.....
1900	968,373	2,844	246	.....	.....	.....	.....
1901	1,107,953	3,051	264	.....	.....	.....	.....
1902	901,912	2,369	267	.....	.....	.....	.....
1903	926,759	2,380	242	.....	.....	.....	.....
1904	1,195,944	2,921	220	.....	.....	.....	.....
1905	1,200,684	3,008	238	.....	.....	.....	.....
1906	1,312,873	3,048	227	.....	.....	.....	.....
1907	1,648,069	4,227	242	.....	.....	.....	.....
1908	1,895,377	4,400	254	.....	.....	.....	.....
1909	1,824,440	4,196	.....	4	0.95	2.19	456,000
1910	1,892,176	4,197	234	7	1.67	3.70	270,000
1911	1,974,593	4,980	226	8	1.61	4.05	247,000

UTAH.

1896	418,627	679	202	[a] 2	.....	.....	.....
1897	521,560	704	204	2	2.84	3.83	261,000
1898	593,709	739	243	3	4.06	5.05	198,000
1899	786,049	743	265	0	.....	.....	.....
1900	1,147,027	1,308	246	209	159.79	182.21	5,000
1901	1,322,614	1,712	259	8	4.67	6.05	165,000
1902	1,574,521	1,826	259	8	4.38	5.08	197,000
1903	1,681,409	1,925	248	7	3.64	4.16	240,000
1904	1,493,027	1,374	294	10	7.28	6.70	149,000
1905	1,332,372	1,361	247	7	5.14	5.25	190,000
1906	1,772,551	1,572	288	8	5.09	4.51	222,000
1907	1,947,607	2,203	258	8	3.63	4.11	243,000
1908	1,846,792	2,664	227	8	3.00	4.33	231,000
1909	2,266,899	3,014	.....	15	4.98	6.62	151,000
1910	2,517,809	3,053	260	15	4.91	5.96	168,000
1911	2,513,175	3,446	236	14	4.06	5.57	180,000

VIRGINIA.

1896	1,254,723	2,510	198	.....	.....	.....	.....
1897	1,528,302	2,344	213	.....	.....	.....	.....
1898	1,815,274	1,855	230	.....	.....	.....	.....
1899	2,105,791	1,960	252	.....	.....	.....	.....
1900	2,393,754	3,631	239	.....	.....	.....	.....
1901	2,725,873	4,152	279	.....	.....	.....	.....
1902	3,182,993	3,912	293	.....	.....	.....	.....
1903	3,451,307	5,608	267	.....	.....	.....	.....
1904	3,410,914	5,165	238	.....	.....	.....	.....
1905	4,275,271	5,730	241	.....	.....	.....	.....
1906	4,254,879	5,131	250	.....	.....	.....	.....
1907	4,710,895	6,670	241	.....	.....	.....	.....
1908	4,259,042	6,208	200	.....	.....	.....	.....
1909	4,752,217	6,191	.....	31	5.01	6.52	153,000
1910	6,507,997	7,264	241	57	7.85	8.76	114,000
1911	6,864,667	8,107	261	68	8.39	9.91	101,000

[a] April 6 to December 31.

TABLE 13.—*Number killed in and about the coal mines of the various States during the calendar years 1896 to 1911, inclusive, in relation to the production and to the number employed*—Continued.

WASHINGTON.

Year.	Production (short tons).	Number employed.	Average number of days worked.	Number killed.			Production per death (short tons).
				Total.	Per 1,000 employed.	Per million short tons mined.	
1896	1,195,504	2,622	221	8	3.05	6.69	149,000
1897	1,434,112	2,739	236	[a] 7	.....	.....	.....
1898	1,884,571	3,145	270	11	3.50	5.84	171,000
1899	2,029,881	3,330	259	45	13.51	22.17	45,000
1900	2,474,093	3,670	289	32	8.72	12.93	77,000
1901	2,578,217	4,545	276	27	5.94	10.47	95,000
1902	2,681,214	4,404	275	34	7.72	12.68	79,000
1903	3,193,273	4,768	285	25	5.24	7.83	128,000
1904	3,137,681	5,287	243	31	5.86	9.88	101,000
1905	2,864,926	4,765	227	12	2.52	4.19	239,000
1906	3,276,184	4,529	266	22	4.86	6.72	149,000
1907	3,680,532	5,945	273	37	6.22	10.05	99,000
1908	3,024,943	5,484	202	25	4.56	8.26	121,000
1909	3,602,263	5,992	.....	39	6.51	10.83	92,000
1910	3,911,899	6,314	256	43	6.81	10.99	91,000
1911	3,572,815	7,236	225	27	3.73	7.56	132,000

WEST VIRGINIA.

1796	12,876,296	19,078	201	67	3.51	5.20	192,000
1897	14,248,159	20,504	205	77	3.76	5.40	185,000
1898	16,700,999	21,607	218	90	4.17	5.39	186,000
1899	19,252,995	23,625	242	96	4.06	4.99	201,000
1900	22,647,207	29,163	231	150	5.14	6.62	151,000
1901	24,068,402	30,935	219	133	4.30	5.53	181,000
1902	24,570,826	35,500	205	134	3.77	5.45	183,000
1903	29,337,241	41,554	210	147	3.54	5.01	200,000
1904	32,406,752	47,235	197	149	3.15	4.60	217,000
1905	37,791,580	48,389	209	212	4.38	5.61	178,000
1906	43,290,350	50,960	220	277	5.44	6.40	156,000
1907	48,091,583	59,029	230	734	12.43	15.26	66,000
1908	41,897,843	56,861	185	309	5.43	7.38	136,000
1909	51,849,220	55,433	.....	336	6.06	6.48	154,000
1910	61,671,019	68,663	228	329	4.79	5.33	187,000
1911	59,831,580	66,800	221	350	5.24	5.85	171,000

WYOMING.

1896	2,229,624	2,937	[b] 210	.....	.....	.....	.....
1897	2,597,886	3,137	219	.....	.....	.....	.....
1898	2,863,812	3,475	242	.....	.....	.....	.....
1899	3,837,392	4,697	261	.....	.....	.....	.....
1900	4,014,602	5,332	266	.....	.....	.....	.....
1901	4,485,374	5,151	248	[c] 41	7.96	9.14	109,000
1902	4,429,491	5,250	248	[c] 190	36.19	42.89	23,000
1903	4,635,293	4,993	252	.....	.....	.....	.....
1904	5,178,556	5,660	262	.....	.....	.....	.....
1905	5,602,021	5,977	236	[c] 12	2.01	2.14	467,000
1906	6,133,994	5,934	281	[c] 15	2.53	2.45	409,000
1907	6,252,990	6,645	275	.....	.....	.....	.....
1908	5,489,902	6,915	217	[c] 81	11.71	14.75	68,000
1909	6,393,109	7,123	.....	30	4.21	4.69	213,000
1910	7,533,088	7,771	248	38	4.89	5.04	198,000
1911	6,744,864	8,118	230	33	4.07	4.89	204,000

[a] May 1 to December 31.
[b] Includes Nebraska.
[c] From Mineral Resources, U. S.: U. S. Geol. Survey.

PART II.

COAL-MINE ACCIDENTS IN FOREIGN COUNTRIES.

GREAT BRITAIN.

Coal mining is the most important mining industry of the United Kingdom. In 1911 there was over three times as much coal mined as all other mineral products, including even quarry material. Of the entire coal area of nearly 7,000 square miles in the United Kingdom, about 98 per cent is in Great Britain, and only 2 per cent in Ireland. Further, the production from the Irish coal fields is extremely small, in 1911 amounting to less than 100,000 short tons out of a total production of nearly 305,000,000 short tons. Consequently the statistics of coal production and coal-mine accidents in the United Kingdom are practically those of Great Britain and are spoken of as such throughout this paper.

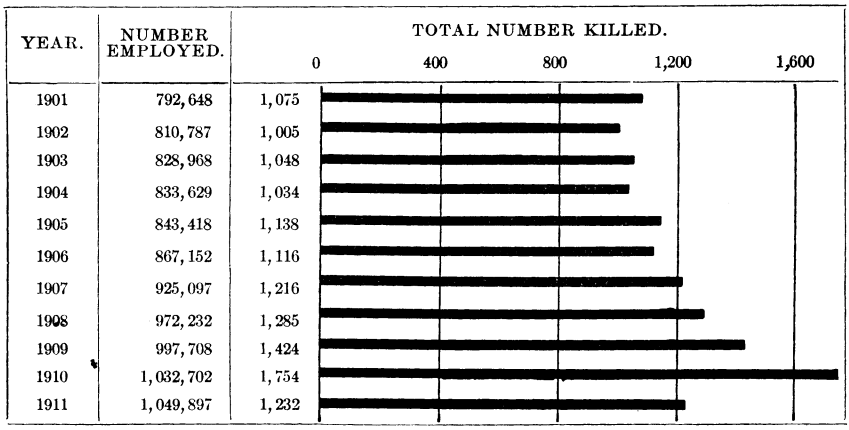


FIGURE 13.—Number killed in and about the coal mines of Great Britain during the years 1901 to 1911.

The official reports of Great Britain contain statistics of coal-mine accidents since 1851. During that year there were 984 fatalities among the 216,217 persons engaged in the coal-mining industry, the death rate per 1,000 employed in and about the mines being 4.55, the highest ever recorded. During each decade since 1851 the average death rate per 1,000 employed has decreased until it was only 1.36 for the 10 years 1901 to 1910.

The first year for which official statistics of the production of coal in Great Britain are available is 1854, when the output was 72,421,000 short tons. In that year 1,045 persons were killed in and about the coal mines, a death rate of 14.43 per 1,000,000 tons of coal mined.

The remarkable improvement made in safety conditions since 1854 is indicated by a corresponding death rate of 4.05 in 1911.

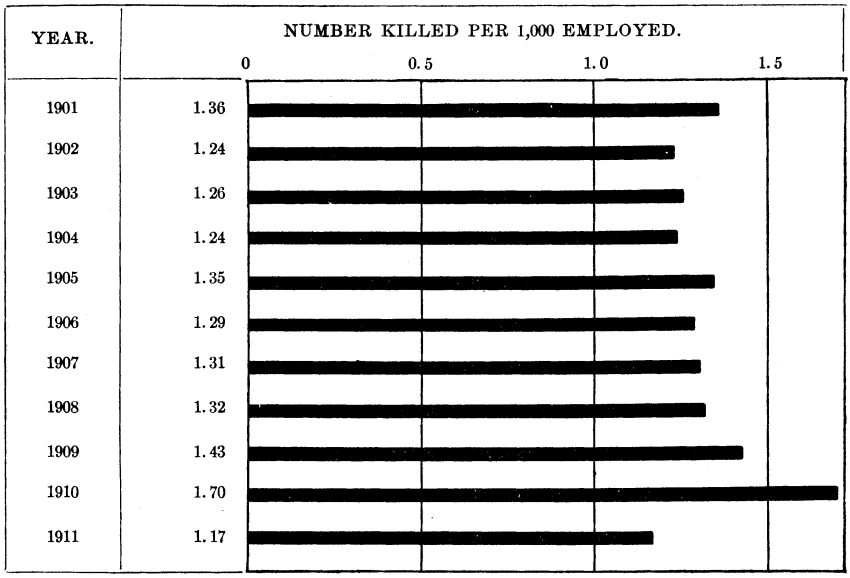


FIGURE 14.—Number killed per 1,000 employed in and about the coal mines of Great Britain during the years 1901 to 1911.

Tables 14 and 15, and figures 13, 14, and 15 show the number of men killed in and about the coal mines of Great Britain from 1901

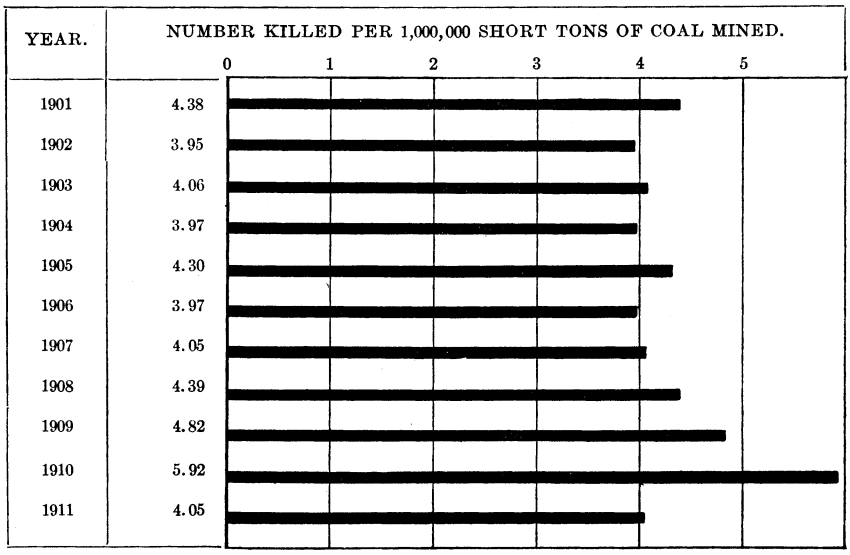


FIGURE 15.—Number killed per 1,000,000 short tons of coal mined in Great Britain during the years 1901 to 1911.

to 1911, inclusive, in relation to the production and to the number of persons employed. It will be noticed that the death rate per

1,000 employed in 1911 was 1.17, a lower rate than for any year of the previous decade, and, in fact, the lowest rate ever recorded for the coal mines of Great Britain. The number of men killed per 1,000,000 short tons of coal mined in 1911 was 4.05 as compared with an average of 4.40 for the preceding decade. Table 15 shows the number killed and the number employed underground and on the surface in the coal mines of Great Britain from 1901 to 1911, inclusive, with corresponding death rates.

TABLE 14.—*Number killed in and about the coal mines of Great Britain, 1901–1911, in relation to the production and to the number employed.*[a]

Year.	Production.		Number employed.	Number killed.			Production per death. (short tons).
	Long tons.	Short tons.		Total.	Per 1,000 employed.	Per 1,000,000 short tons mined.	
1901	219,037,000	245,321,000	792,648	1,075	1.36	4.38	228,000
1902	227,085,000	254,335,000	810,787	1,005	1.24	3.95	253,000
1903	230,324,000	257,963,000	828,968	1,048	1.26	4.06	246,000
1904	232,412,000	260,301,000	833,629	1,034	1.24	3.97	252,000
1905	236,111,000	264,444,000	843,418	1,138	1.35	4.30	232,000
1906	251,051,000	281,177,000	867,152	1,116	1.29	3.97	252,000
1907	267,813,000	299,951,000	925,097	1,216	1.31	4.05	247,000
1908	261,512,000	292,893,000	972,232	1,285	1.32	4.39	228,000
1909	263,759,000	295,410,000	997,708	1,424	1.43	4.82	207,000
1910	264,418,000	296,148,000	1,032,702	1,754	1.70	5.92	169,000
Average, 1901–1910	245,352,000	274,794,000	890,434	1,210	1.36	4.40	227,000
1911	271,878,000	304,503,000	1,049,897	1,232	1.17	4.05	247,000

[a] Data from Mines and Quarries: General report, with statistics.

TABLE 15.—*Number killed and number employed underground and on the surface in the coal mines of Great Britain, 1901–1911, inclusive.*[a]

Year.	Underground.			Surface.			Total.		
	Number employed.	Number killed.	Number killed per 1,000 employed.	Number employed.	Number killed.	Number killed per 1,000 employed.	Number employed.	Number killed.	Number killed per 1,000 employed.
1901	636,400	927	1.46	156,248	148	0.95	792,648	1,075	1.36
1902	651,505	890	1.37	159,282	115	.72	810,787	1,005	1.24
1903	666,144	895	1.34	162,824	153	.94	828,968	1,048	1.26
1904	670,300	894	1.33	163,329	140	.86	833,629	1,034	1.24
1905	678,858	1,013	1.49	164,560	125	.76	843,418	1,138	1.35
1906	697,120	984	1.41	170,032	132	.78	867,152	1,116	1.29
1907	745,197	1,074	1.44	179,900	142	.79	925,097	1,216	1.31
1908	783,632	1,140	1.45	188,600	145	.77	972,232	1,285	1.32
1909	805,095	1,294	1.61	192,613	130	.67	997,708	1,424	1.43
1910	834,751	1,601	1.92	197,951	153	.77	1,032,702	1,754	1.70
Average, 1901–1910	716,900	1,071	1.49	173,534	138	.80	890,434	1,210	1.36
1911	849,421	1,085	1.28	200,476	147	.73	1,049,897	1,232	1.17

[a] Data from Mines and Quarries: General report, with statistics.

Table 16 shows the number killed and injured in and about the coal mines in 1911, the last year for which official statistics are available, with the fatalities and injuries classified according to cause. It will be noticed that out of a total of 1,232 deaths, 599, or 48.62 per cent, were caused by falls of roof and coal; 256, or 20.78 per cent, by haulage accidents, whereas accidents from gas and coal-dust explosions resulted in only 34 deaths, or 2.76 per cent of the total number, and accidents from explosives underground caused only 1.3 per cent. Of the total number of deaths, shaft accidents caused 8.04 per cent and surface accidents 11.93 per cent.

TABLE 16.—*Number killed and injured in and about the coal mines of Great Britain in 1911, with the fatalities and injuries classified according to cause.*[a]

Cause.	Number killed.	Per cent of total number killed.	Number injured.[b]	Per cent of total number injured.
Falls of roof and coal	599	48.62	57,692	35.20
Haulage accidents (underground)	256	20.78	(c)	(c)
Gas and coal-dust explosions	34	2.76	165	.10
Explosives (underground)	16	1.30	(c)	(c)
Other causes (underground)	81	6.57	93,281	56.92
Shaft accidents	99	8.04	625	.38
Surface accidents	147	11.93	12,122	7.40
Total	1,232	100.00	163,885	100.00

[a] Data from Mines and Quarries: General report, with statistics.
[b] Includes all persons incapacitated for more than 7 days.
[c] Not separately reported; included under "Other causes."

The number of persons disabled by accidents for more than seven days was 163,885, or over 15 per cent of the total number employed. This number seems enormous when compared with the 31,334 reported injuries in the coal mines of the United States in 1911 that resulted in incapacity for more than one day. The fact that the number incapacitated for more than one day by accidents in the coal mines of the United States amounts to little more than 4 per cent of the total number employed as compared with the much higher percentage of injuries of a more serious nature in the coal mines of Great Britain indicates that the statistics of nonfatal accidents for the United States are very incomplete. Of course, in Great Britain, on account of the employers' liability laws, every accident, however slight, is probably reported by the employer, as there is no method of telling what the final result of even the slightest accident may be, and the employer may have difficulty in collecting his insurance if an accident that appears slight at the time but later becomes serious should not be reported. As compared with the 168,885 injuries reported in the coal mines of Great Britain in 1911, there were only 143,258 such injuries in 1908, an increase of more than 17 per cent in a period of three years.

GERMANY.

There are no official reports of coal-mine accidents in Germany as a whole, and the statistics given herewith are for the coal mines of Prussia only. As this State, however, produces over 90 per cent of the total output of coal in the German Empire, the statistics of production and coal-mine accidents in Prussia are practically those of Germany and are spoken of as such in this paper. The statistics of the lignite or "braunkohle" industry, which employs about one-tenth of the number of men engaged in the coal-mining industry proper, are not included in this report.

The statistics for coal-mine accidents in Prussia were first published in 1852, and have been issued annually since that time. In that year there were 59 deaths among 36,029 persons employed in and about the mines, a death rate of 1.64 per 1,000 employed. As the

YEAR.	NUMBER EMPLOYED.	TOTAL NUMBER KILLED.
1901	408,375	956
1902	411,323	818
1903	429,837	826
1904	449,160	808
1905	452,151	840
1906	469,700	924
1907	503,227	1,206
1908	549,753	1,490
1909	570,528	1,165
1910	577,263	1,140
1911	586,538	1,176

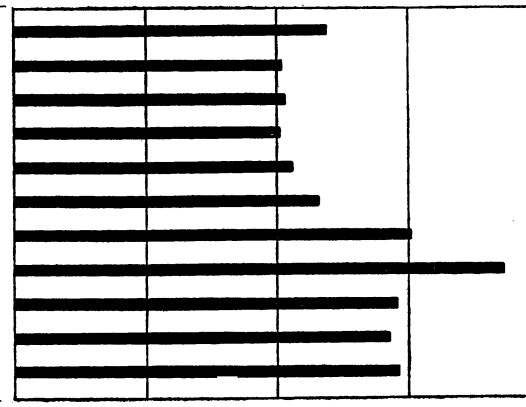


FIGURE 16.—Number killed in and about the coal mines of Germany, 1901 to 1911.

production of coal increased, the death rate per 1,000 employed, although varying from year to year, showed a distinct increase when considered by five-year periods, and in 1882 it reached 3.41, the highest rate ever recorded for Prussia. Since 1882 the death rate per 1,000 employed has decreased, the rate for 1911 being 2 with an average of 2.11 for the decade 1901 to 1910.

Tables 17 and 18 and figures 16, 17, and 18 show the number of persons killed in and about the coal mines of Germany from 1901 to 1911, inclusive, with relation to the production and number of persons employed.

Table 19 shows the number killed in and about the coal mines of Germany in 1911, with the fatalities classified according to cause.

No complete official statistics of nonfatal accidents in the coal mines of Germany as a whole have ever been published.

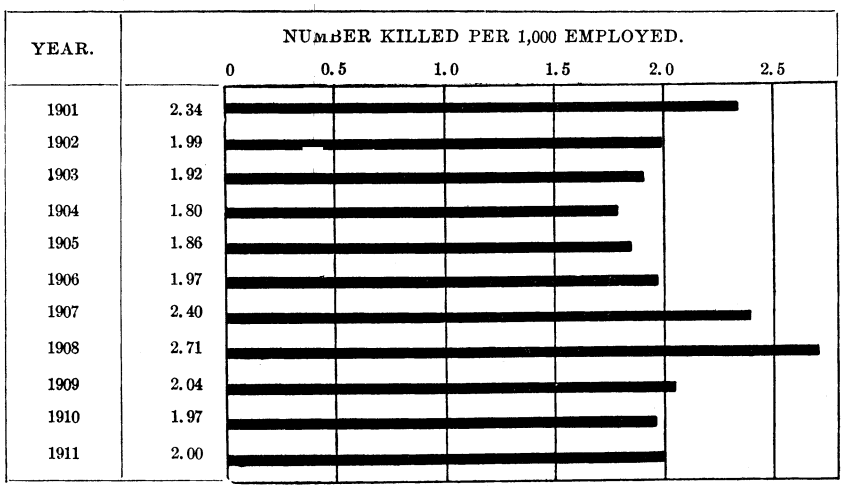


FIGURE 17.—Number killed per 1,000 employed in and about the coal mines of Germany, 1901 to 1911.

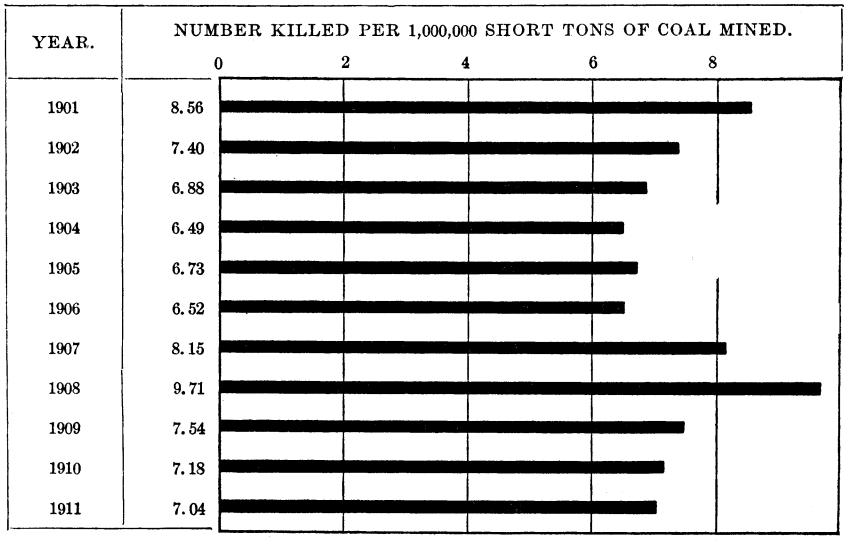


FIGURE 18.—Number killed per 1,000,000 short tons of coal mined in Germany, 1901 to 1911.

TABLE 17.—*Number killed in and about the coal mines of Germany,[a] 1901 to 1911, in relation to the production and to the number employed.[b]*

Year.	Production.		Number employed.	Number killed.			Production per death (short tons).
	Metric tons.	Short tons.		Total.	Per 1,000 employed.	Per 1,000,000 short tons mined.	
1901	101,362,000	111,732,000	408,375	956	2.34	8.56	117,000
1902	100,273,000	110,532,000	411,323	818	1.99	7.40	135,000
1903	108,983,000	120,133,000	429,837	826	1.92	6.88	145,000
1904	112,934,000	124,488,000	449,160	808	1.80	6.49	154,000
1905	113,188,000	124,768,000	452,151	840	1.86	6.73	149,000
1906	128,493,000	141,639,000	469,700	924	1.97	6.52	153,000
1907	134,249,000	147,984,000	503,227	1,206	2.40	8.15	123,000
1908	139,206,000	153,448,000	549,753	1,490	2.71	9.71	103,000
1909	140,098,000	154,431,000	570,528	1,165	2.04	7.54	133,000
1910	143,965,000	158,694,000	577,263	1,140	1.97	7.18	139,000
Average 1901-1910	122,275,000	134,785,000	482,132	1,017	2.11	7.55	133,000
1911	151,521,000	167,022,000	586,538	1,176	2.00	7.04	142,000

[a] Prussia only.
[b] Data from Zeitschrift für das Berg,- Hütten- und Salinenwesen im Preussischen Staate.

TABLE 18.—*Number killed and number employed underground and on the surface in the coal mines of Germany,[a] 1901 to 1911.[b]*

Year.	Underground.			Surface.			Total.		
	Number employed.	Number killed.	Number killed per 1,000 employed.	Number employed.	Number killed.	Number killed per 1,000 employed.	Number employed.	Number killed.	Number killed per 1,000 employed.
1901	313,196	831	2.65	95,179	125	1.31	408,375	956	2.34
1902	313,716	708	2.26	97,607	110	1.13	411,323	818	1.99
1903	326,415	722	2.21	103,422	104	1.01	429,837	826	1.92
1904	340,442	695	2.04	108,718	113	1.04	449,160	808	1.80
1905	341,728	735	2.15	110,423	105	.95	452,151	840	1.86
1906	354,052	795	2.25	115,648	129	1.12	469,700	924	1.97
1907	377,899	1,062	2.81	125,328	144	1.15	503,227	1,206	2.40
1908	414,274	1,344	3.24	135,479	146	1.08	549,753	1,490	2.71
1909	427,968	1,015	2.37	142,560	150	1.05	570,528	1,165	2.04
1910	431,971	999	2.31	145,292	141	.97	577,263	1,140	1.97
Average, 1901-1910	364,166	891	2.44	117,966	127	1.07	482,132	1,017	2.11
1911	437,864	1,019	2.33	148,674	157	1.06	586,538	1,176	2.00

[a] Prussia only.
[b] Data from Zeitschrift für das Berg,- Hütten- und Salinenwesen in Preussischen Staate.

TABLE 19.—*Number killed in and about the coal mines of Germany[a] in 1911, with the fatalities classified according to cause.[b]*

Cause.	Number killed.	Per cent of total number killed.
Falls of roof and coal	442	37.59
Haulage accidents (underground)	181	15.39
Gas and coal-dust explosions	32	2.72
Explosives (underground)	43	3.66
Other causes (underground)	[c] 219	18.62
Shaft accidents	102	8.67
Surface accidents	157	13.35
Total	1,176	100.00

[a] Prussia only.
[b] Data from Zeitschrift für das Berg,- Hütten- und Salinenwesen im Preussischen Staate.
[c] Includes unclassified accidents.

FRANCE.

The first official statistics of accidents in the coal mines of France were published in 1853, and, with the exception of statistics for 1859, have been issued annually since that time. In 1853 France produced 6,545,000 short tons of coal and employed 30,692 persons in and about the mines. In 1910, the last year for which official figures are available, the production was 42,274,000 short tons, or over eight times as much, and the number of persons employed was 196,786, or over six times as many as in 1853. In the last-mentioned year the number of persons killed per 1,000 employed was 5.18 and the number killed per 1,000,000 short tons of coal mined was 24.29. In 1910 the death rate per 1,000 employed was 1.08 and the death rate per 1,000,000 short tons of coal mined was 5.04.

Tables 20 and 21 and figures 19, 20, and 21 show the number of persons killed in and about the coal mines of France during the decade 1901 to 1910 in relation to the production and the number of persons employed. It will be noted that, with the exception of the rates for 1906, the fatality rates per 1,000 employed and per 1,000,000 short tons of coal mined are remarkably uniform, showing only a slight improvement in the last half of the decade. However, a comparison of the death rates during the decade under consideration with the rates for previous decades shows a marked improvement. The extremely high death rates in 1906 were caused by the Courrieres mine explosion in which 1,099 persons lost their lives. This accident was the most disastrous in the history of coal mining, not only in France but in the entire world, and killed more persons than were killed in all of the coal mines of France in any other 5 years of the decade.

TABLE 20.—*Number killed in and about the coal mines of France, 1901 to 1910, in relation to the production and to the number employed.*[a]

Year.	Production.		Number employed.	Number killed.			Production per death (short tons).
	Metric tons.	Short tons.		Total.	Per 1,000 employed.	Per 1,000,000 short tons mined.	
1901	32,325,000	35,632,000	163,796	198	1.21	5.56	180,000
1902	29,997,000	33,066,000	164,810	180	1.09	5.44	184,000
1903	34,906,000	38,477,000	167,213	170	1.02	4.42	226,000
1904	34,168,000	37,664,000	171,792	184	1.07	4.89	205,000
1905	35,928,000	39,604,000	175,074	182	1.04	4.60	218,000
1906	34,196,000	37,695,000	178,431	1,280	7.17	33.96	29,000
1907	36,754,000	40,514,000	183,862	202	1.10	4.99	201,000
1908	37,384,000	41,209,000	194,980	186	.95	4.51	222,000
1909	37,840,000	41,711,000	190,748	223	1.17	5.35	187,000
1910	38,350,000	42,274,000	196,786	213	1.08	5.04	198,000
Average, 1901–1910	35,185,000	38,785,000	178,749	302	1.69	7.79	128,000

[a] Data from Statisque de l'Industrie Minérale et des Appareils à Vapeur en France et en Algérie.

YEAR.	NUMBER EMPLOYED.	TOTAL NUMBER KILLED.
1901	163,796	198
1902	164,810	180
1903	167,213	170
1904	171,792	184
1905	175,074	182
1906	178,431	1,280
1907	183,862	202
1908	194,980	186
1909	190,748	223
1910	196,786	213

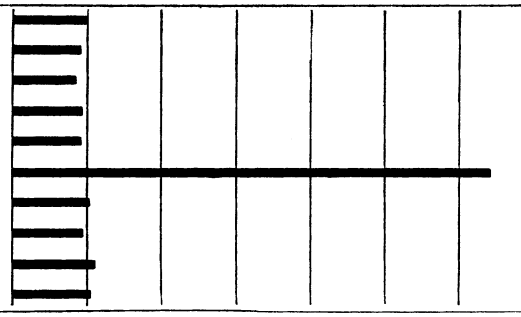


FIGURE 19.—Number killed in and about the coal mines of France, 1901 to 1910.

YEAR.	NUMBER KILLED PER 1,000 EMPLOYED.
1901	1.21
1902	1.09
1903	1.02
1904	1.07
1905	1.04
1906	7.17
1907	1.10
1908	0.95
1909	1.17
1910	1.08

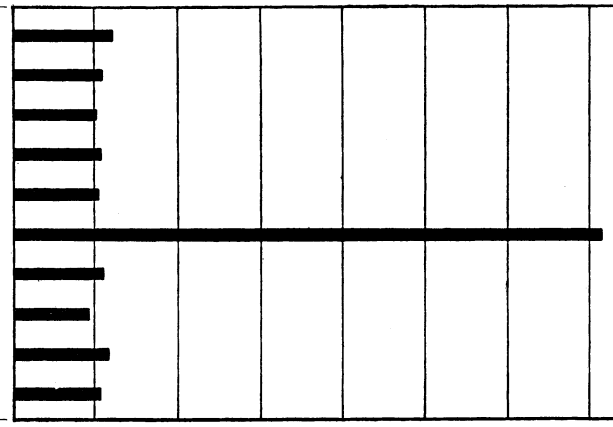


FIGURE 20.—Number killed per 1,000 employed in and about the coal mines of France, 1901 to 1910.

YEAR.	NUMBER KILLED PER 1,000,000 SHORT TONS OF COAL MINED.
1901	5.56
1902	5.44
1903	4.42
1904	4.89
1905	4.60
1906	33.96
1907	4.99
1908	4.51
1909	5.34
1910	5.04

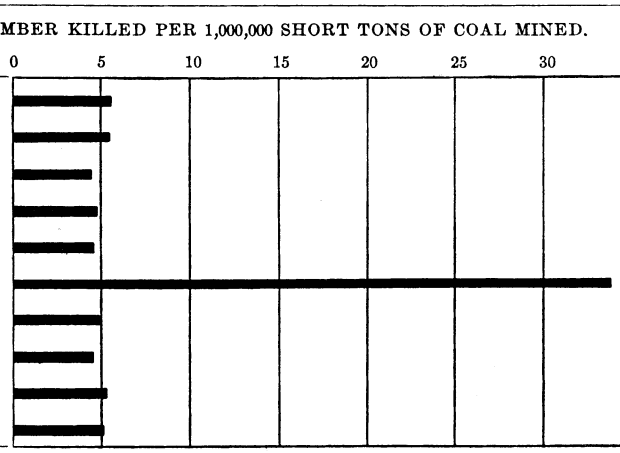


FIGURE 21.—Number killed per 1,000,000 short tons of coal mined in France, 1901 to 1910.

TABLE 21.—*Number killed and number employed underground and on the surface in the coal mines of France, 1901 to 1910, inclusive.* [a]

Year.	Underground.			Surface.			Total.		
	Number employed.	Number killed.	Number killed per 1,000 employed.	Number employed.	Number killed.	Number killed per 1,000 employed.	Number employed.	Number killed.	Number killed per 1,000 employed.
1901	117,335	164	1.40	46,461	34	0.73	163,796	198	1.21
1902	118,743	151	1.27	46,067	29	.63	164,810	180	1.09
1903	120,941	144	1.19	46,272	26	.56	167,213	170	1.02
1904	123,201	153	1.24	48,591	31	.64	171,792	184	1.07
1905	126,954	147	1.16	48,120	35	.73	175,074	182	1.04
1906	129,624	1,235	9.53	48,807	45	.92	178,431	1,280	7.17
1907	133,117	156	1.17	50,745	46	.91	183,862	202	1.10
1908	141,670	149	1.05	53,310	37	.69	194,980	186	.95
1909	137,433	178	1.30	53,315	45	.84	190,748	223	1.17
1910	142,690	174	1.22	54,096	39	.72	196,786	213	1.08
Average, 1901–1910.	129,171	265	2.05	49,578	37	.75	178,749	302	1.69

[a] Data from Statistique de l'Industrie Minérale et des Appareils à Vapeur en France et en Algérie.

Table 22 shows the number killed and injured in and about the coal mines of France in 1910, with fatalities classified according to cause. It may be noted that 38.03 per cent of the deaths was due to falls of roof and coal and 13.14 per cent to haulage accidents underground. These percentages are unusually low and speak well for the efficiency of the mine-inspection system of France.

Out of a total number of 196,786 persons employed in 1910 there were 43,381 incapacitated by accidents for more than 4 days, or over 22 per cent.

TABLE 22.—*Number killed and injured in and about the coal mines of France in 1910, with the fatalities and injuries classified according to cause.* [a]

Cause.	Number killed.	Per cent of total number killed.	Number injured.[b]	Per cent of total number injured.
Falls of roof and coal	81	38.03	15,660	36.10
Haulage accidents (underground)	28	13.14	10,549	24.32
Gas and coal-dust explosions	9	4.23	4	.01
Explosives (underground)	3	1.41	79	.18
Other causes (underground)	16	7.51	11,716	27.01
Shaft accidents	37	17.37	363	.83
Surface accidents	39	18.31	5,010	11.55
Total	213	100.00	43,381	100.00

[a] Data from Statistique de l'Industrie Minérale et des Appareils à Vapeur en France et en Algérie.
[b] Includes all persons incapacitated for more than 4 days.

BELGIUM.

The collection of statistics of accidents in the coal mines of Belgium was undertaken almost two decades before such work was attempted by any other country, the first statistics compiled being those for 1831. No figures concerning the number of persons employed, however, were published until 1851, when there were 108 fatalities among the 49,500 persons employed in the coal-mining

industry, a death rate of 2.18 per 1,000 employed and 15.72 per 1,000,000 short tons of coal mined. In the next year the number killed per 1,000 employed was 4.94 and the number killed per 1,000,000 short tons of coal mined was 34.17, both of these rates being the highest ever recorded. From 1852 the rates showed a general tendency downward and reached a minimum in 1905, when the death rate per 1,000 employed was 0.91, and per 1,000,000 short tons of coal mined, 5.08.

Tables 23 and 24, and figures 22, 23, and 24 show the number of persons killed in and about the coal mines of Belgium during the years 1901 to 1911, inclusive, in relation to the production and to the number of persons employed.

TABLE 23.—*Number killed in and about the coal mines of Belgium, 1901 to 1911, in relation to the production and to the number employed.*[a]

Year.	Production.		Number employed.	Number killed.			Production per death (short tons).
	Metric tons.	Short tons.		Total.	Per 1,000 employed.	Per 1,000,000 short tons mined.	
1901	22,213,000	24,486,000	134,092	157	1.17	6.41	156,000
1902	22,877,000	25,218,000	134,889	144	1.07	5.71	175,000
1903	23,797,000	26,232,000	139,592	159	1.14	6.06	165,000
1904	22,761,000	25,090,000	138,567	129	.93	5.14	194,000
1905	21,775,000	24,003,000	134,747	123	.91	5.12	195,000
1906	23,570,000	25,981,000	139,394	132	.95	5.08	197,000
1907	23,705,000	26,130,000	142,699	147	1.03	5.63	178,000
1908	23,558,000	25,968,000	145,277	155	1.07	5.97	168,000
1909	23,518,000	25,924,000	143,011	136	.95	5.25	191,000
1910	23,917,000	26,364,000	143,701	136	.95	5.16	194,000
Average 1901–1910	23,169,000	25,540,000	139,597	142	1.02	5.56	180,000
1911	23,054,000	25,412,000	144,054	165	1.15	6.49	154,000

[a] Data from Annales des Mines de Belgique.

TABLE 24.—*Number killed and number employed underground and on the surface in the coal mines of Belgium, 1901 to 1911.*[a]

Year.	Underground.			Surface.			Total.		
	Number employed.	Number killed.	Number killed per 1,000 employed.	Number employed.	Number killed.	Number killed per 1,000 employed.	Number employed.	Number killed.	Number killed per 1,000 employed.
1901	98,815	142	1.44	35,277	15	0.43	134,092	157	1.17
1902	98,600	122	1.24	36,289	22	.61	134,889	144	1.07
1903	102,064	136	1.33	37,528	23	.61	139,592	159	1.14
1904	100,442	111	1.11	38,125	18	.47	138,567	129	.93
1905	97,705	113	1.16	37,042	10	.27	134,747	123	.91
1906	102,238	118	1.15	37,156	14	.38	139,394	132	.95
1907	104,739	132	1.26	37,960	15	.40	142,699	147	1.03
1908	105,753	133	1.26	39,524	22	.56	145,277	155	1.07
1909	103,217	122	1.18	39,794	14	.35	143,011	136	.95
1910	103,443	121	1.17	40,258	15	.37	143,701	136	.95
Average 1901–1910	101,702	125	1.23	37,895	17	.45	139,597	142	1.02
1911	103,937	144	1.39	40,117	21	.52	144,054	165	1.15

[a] Data from Annales des Mines de Belgique.

Table 25 shows the number of persons killed and injured in and about the coal mines of Belgium in 1911, the last year for which offi-

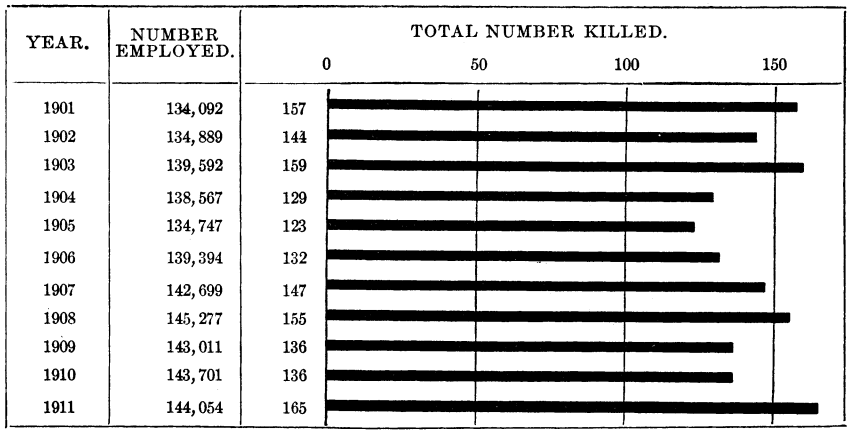


FIGURE 22.—Number killed in and about the coal mines of Belgium, 1901 to 1911.

cial statistics are available, with fatalities and injuries classified according to cause.

It will be noted that the table gives only the number of persons seriously injured. In explanation, it may be stated that the Belgian mine regulations define a serious injury as one that causes death after

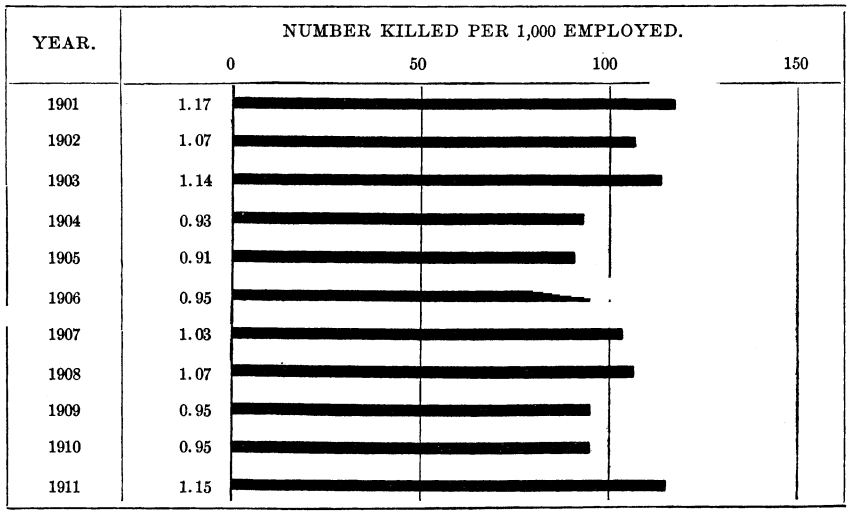


FIGURE 23.—Number killed per 1,000 employed in and about the coal mines of Belgium, 1901 to 1911.

one month from the date of injury, or one that causes permanent incapacity.

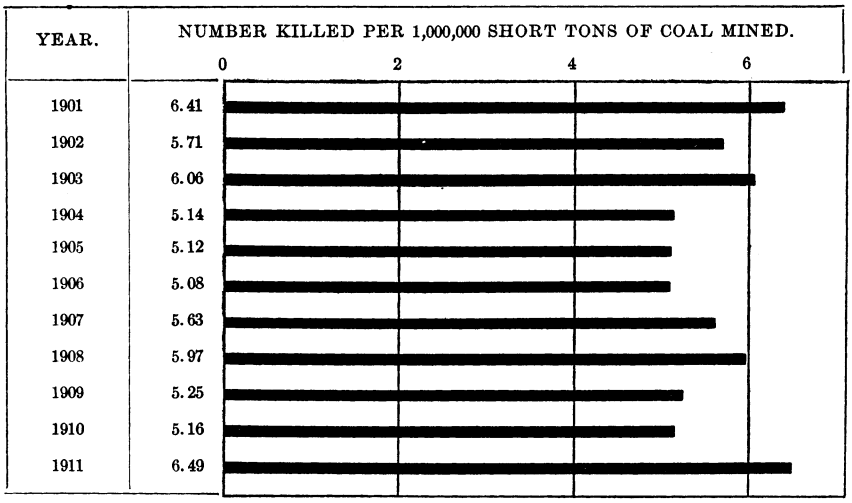


FIGURE 24.—Number killed per 1,000,000 short tons of coal mined in Belgium, 1901 to 1911.

TABLE 25.—*Number killed and injured in and about the coal mines of Belgium in 1911, with the fatalities and injuries classified according to cause.* [a]

Cause.	Number killed.	Per cent of total number killed.	Number injured.[b]	Per cent of total number injured.
Falls of roof and coal	56	33.94	23	19.01
Haulage accidents (underground)	27	16.36	32	26.45
Gas and coal-dust explosions	1	.61	0	0.00
Explosives (underground)	8	4.85	11	9.09
Other causes (underground)	23	13.94	19	15.70
Shaft accidents	29	17.57	8	6.61
Surface accidents	21	12.73	28	23.14
Total	165	100.00	121	100.00

[a] Data from Annales des Mines de Belgique. [b] Includes only persons seriously injured.

JAPAN.

Table 26 and figures 25, 26, and 27 show the number of men killed in and about the coal mines of Japan from 1901 to 1910 in relation to the production and to the number of persons employed. It will be noted that although the death rate per 1,000 employed compares well with that of other countries, averaging only 2.92 for the decade, the number of men killed per 1,000,000 short tons mined is high, averaging 22.71 for the decade and reaching 39.14 in 1906. This high death rate in relation to the production is accounted for by the extremely small tonnage mined by the Japanese workman in a year. In 1910, for example, the last year for which official statistics are available, the tonnage mined by each man employed was only 126 short tons as compared with an output of 692 short tons in the same year for each man employed in and about the coal mines in the United States. It would seem that because of the relative cheapness of labor, coal-mine

YEAR.	NUMBER EMPLOYED.	TOTAL NUMBER KILLED.
1901	75,230	180
1902	78,894	135
1903	84,941	215
1904	88,340	189
1905	79,505	256
1906	106,589	560
1907	128,772	468
1908	126,999	245
1909	152,515	535
1910	137,467	307

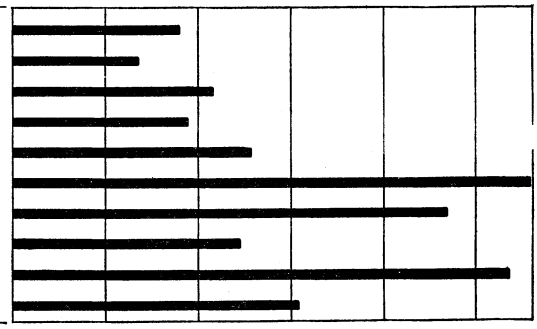


FIGURE 25.—Number killed in and about the coal mines of Japan, 1901 to 1910.

YEAR.	NUMBER KILLED PER 1,000 EMPLOYED.
1901	2.39
1902	1.71
1903	2.53
1904	2.14
1905	3.22
1906	5.25
1907	3.63
1908	1.93
1909	3.51
1910	2.23

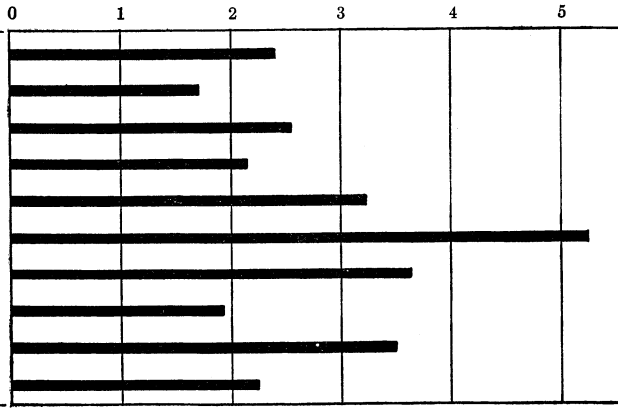


FIGURE 26.—Number killed per 1,000 employed in and about the coal mines of Japan, 1901 to 1910.

YEAR	NUMBER KILLED PER 1,000,000 SHORT TONS OF COAL MINED.
1901	18.11
1902	12.62
1903	19.33
1904	15.99
1905	20.12
1906	39.14
1907	30.76
1908	14.99
1909	32.25
1910	17.76

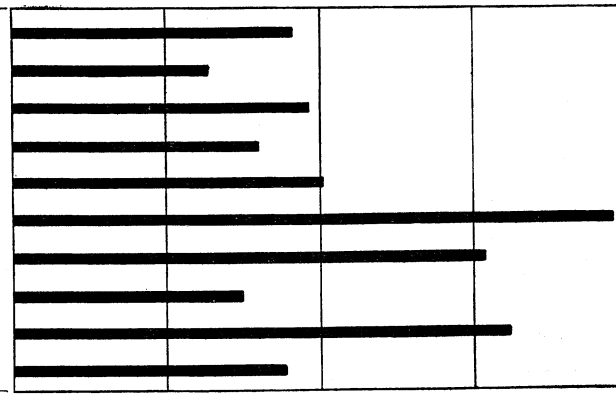


FIGURE 27.—Number killed per 1,000,000 short tons of coal mined in Japan, 1901 to 1910.

operators in Japan do not make as much use of labor-saving machinery as operators in many other countries.

TABLE 26.—*Number killed in and about the coal mines of Japan, 1901 to 1910, in relation to the production and to the number employed.* [a]

Year.	Production.		Number employed.	Number killed.			Production per death (short tons).
	Metric tons.	Short tons.		Total.	Per 1,000 employed.	Per 1,000,000 short tons mined.	
1901	9,018,000	9,941,000	75,230	180	2.39	18.11	55,000
1902	9,702,000	10,695,000	78,894	135	1.71	12.62	79,000
1903	10,089,000	11,121,000	84,941	215	2.53	19.33	52,000
1904	10,724,000	11,821,000	88,330	189	2.14	15.99	63,000
1905	11,542,000	12,723,000	79,505	256	3.22	20.12	50,000
1906	12,980,000	14,308,000	106,589	560	5.25	39.14	26,000
1907	13,804,000	15,216,000	128,772	468	3.63	30.76	33,000
1908	14,825,000	16,342,000	126,999	245	1.93	14.99	67,000
1909	15,048,000	16,588,000	152,515	535	3.51	32.25	31,000
1910	15,681,000	17,285,000	137,467	307	2.23	17.76	56,000
Average, 1901-1910	12,341,000	13,604,000	105,924	309	2.92	22.71	44,000

[a] Data from Statistical Report of the Department of Agriculture and Commerce, Japan.

Table 27 shows the number killed and injured in and about the coal mines of Japan in 1910, with the fatalities and injuries classified according to cause. It will be noted that accidents from falls of roof and coal resulted in 198 deaths, or 64.51 per cent of the total. This is the highest percentage of fatalities from this cause in any of the leading coal-producing countries and indicates either that conditions of the roof are extremely bad in Japanese mines or that the mines are poorly and inefficiently timbered.

Although the Japanese official reports make a classification of the injured according to "severely wounded" and "slightly wounded," no mention is made of what is considered a severe or a slight injury, and therefore the classification is of little value. Accordingly, in Table 27 the injuries coming under these two heads have been combined.

TABLE 27.—*Number killed and injured in and about the coal mines of Japan in 1910, with the fatalities and injuries classified according to cause.* [a]

Cause.	Number killed.	Per cent of total number killed.	Number injured.[b]	Per cent of total number injured.
Falls of roof and coal	198	64.50	3,746	51.35
Haulage accidents (underground)	37	12.05	1,174	16.09
Gas and coal-dust explosions	8	2.60	66	.90
Explosives (underground)	1	.33	27	.37
Other causes (underground)	31	10.10	1,488	20.40
Shaft accidents	18	5.86	89	1.22
Surface accidents	14	4.56	705	9.67
Total	307	100.00	7,295	100.00

[a] Data from Statistical Report of the Department of Agriculture and Commerce, Japan.
[b] Includes seriously and slightly injured.

AUSTRIA.

Official statistics of coal-mine accidents in Austria have been published since 1875. Until 1885, however, they related only to adult male workers, and since that time only to men and to boys 14 years of age and over.

Table 28 and figures 28, 29, and 30 show the number killed in and about the coal mines of Austria from 1901 to 1911 in relation to the production and to the number of persons employed.

Statistics of the lignite or "braunkohle" industry in Austria are not included in this report.

TABLE 28.—*Number killed in and about the coal mines of Austria, 1901–1911, in relation to the production and to the number employed.*[a]

Year.	Production.		Number employed.	Number killed.			Production per death (short tons).
	Metric tons.	Short tons.		Total.	Per 1,000 employed.	Per 1,000,000 short tons mined.	
1901	11,739,000	12,940,000	70,344	84	1.19	6.49	154,000
1902	11,045,000	12,175,000	66,582	72	1.08	5.91	169,000
1903	11,498,000	12,674,000	66,663	49	.74	3.87	259,000
1904	11,868,000	13,082,000	66,507	61	.92	4.66	214,000
1905	12,585,000	13,873,000	66,072	96	1.45	6.92	145,000
1906	13,473,000	14,851,000	68,115	70	1.03	4.71	212,000
1907	13,850,000	15,267,000	69,995	75	1.07	4.91	204,000
1908	13,875,000	15,295,000	68,477	59	.86	3.86	259,000
1909	13,713,000	15,116,000	70,159	75	1.07	4.96	202,000
1910	13,774,000	15,183,000	69,969	65	.93	4.28	234,000
Average, 1901–1910	12,742,000	14,046,000	68,288	71	1.04	5.05	198,000
1911	14,380,000	15,851,000	69,827	88	1.26	5.55	180,000

[a] Data from Statistik des Bergbaues in Österreich.

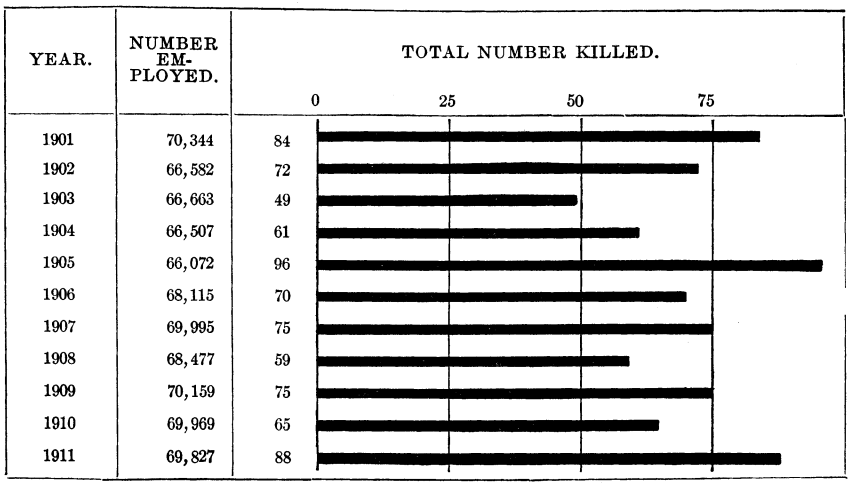


FIGURE 28.—Number killed in and about the coal mines of Austria, 1901 to 1911.

Table 29 shows the number killed and injured in and about the coal mines of Austria in 1911. Unfortunately no mention is made in

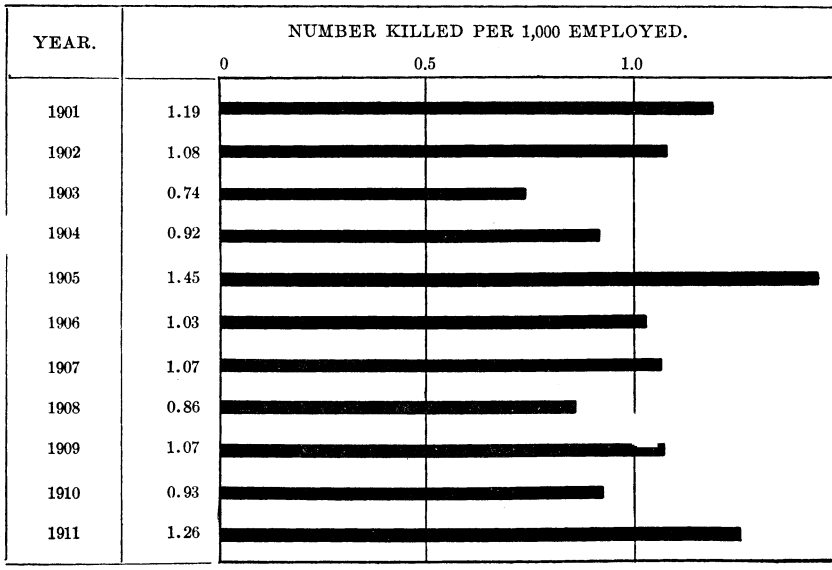


FIGURE 29.—Number killed per 1,000 employed in and about the coal mines of Austria, 1901 to 1911.

the official report regarding the severity of the injuries enumerated other than that of the 842 injuries reported 430 were of such nature as to cause disablement for 20 days or more.

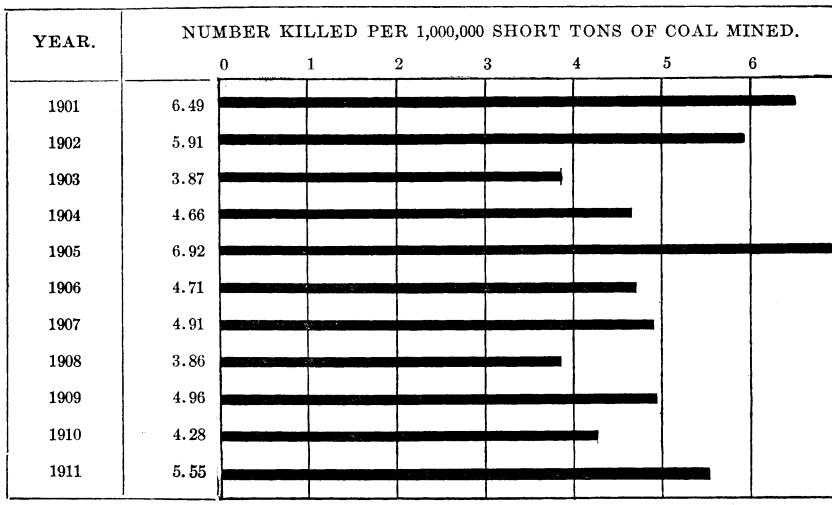


FIGURE 30.—Number killed per 1,000,000 short tons of coal mined in Austria, 1901 to 1911.

TABLE 29.—*Number killed and injured in and about the coal mines of Austria in 1911.*[a]

By accidents.	Number killed.	Per cent of total number killed.	Number injured.	Per cent of total number injured.
Underground	63	71.59	630	74.82
In vertical shafts	12	13.64	34	4.04
On the surface	13	14.77	178	21.14
Total	88	100.00	842	100.00

[a] Data from Statistik des Bergbaues in Österreich.

INDIA.

Table 30 and figures 31, 32, and 33 show the number killed in and about the coal mines of India from 1901 to 1911 in relation to the production and to the number employed. Up to 1908 India had the lowest death rate per 1,000 employed of any country in the world. In that year, however, there was a notable increase in the rate and Belgium succeeded to the position formerly occupied by India. The death rate per 1,000 employed in the coal mines in 1911 was 1.39 and 0.96 for the 10 years from 1901 to 1910. The fatality rate per 1,000,000 short tons of coal mined was 10.97 in 1911, and the average rate for the 10 years 1901 to 1910 was 9.

TABLE 30.—*Number killed in and about the coal mines of India, 1901 to 1911, in relation to the production and to the number employed.*[a]

Year.	Production.		Number employed.	Number killed.			Production per death (short tons).
	Long tons.	Short tons.		Total.	Per 1,000 employed.	Per 1,000,000 short tons mined.	
1901	6,252,000	7,702,000	85,361	58	0.68	7.53	133,000
1902	6,791,000	7,606,000	89,503	59	.66	7.76	129,000
1903	6,813,000	7,631,000	79,561	67	.84	8.78	114,000
1904	7,561,000	8,468,000	82,002	55	.67	6.50	154,000
1905	7,770,000	8,702,000	79,506	58	.73	6.67	150,000
1906	9,113,000	10,207,000	90,159	80	.89	7.84	128,000
1907	10,526,000	11,789,000	102,689	89	.87	7.55	132,000
1908	12,149,000	13,607,000	120,107	164	1.37	12.05	83,000
1909	11,294,000	12,649,000	109,291	119	1.09	9.41	106,000
1910	11,388,000	12,755,000	105,285	160	1.52	12.54	80,000
Average 1901–1910	8,966,000	10,112,000	94,346	91	0.96	9.00	111,000
1911	12,049,000	13,495,000	106,598	148	1.39	10.97	91,000

[a] Data from Report of the Chief Inspector of Mines in India.

Table 31 shows the number killed in and about the coal mines of India in 1911, the last year for which official statistics are available,

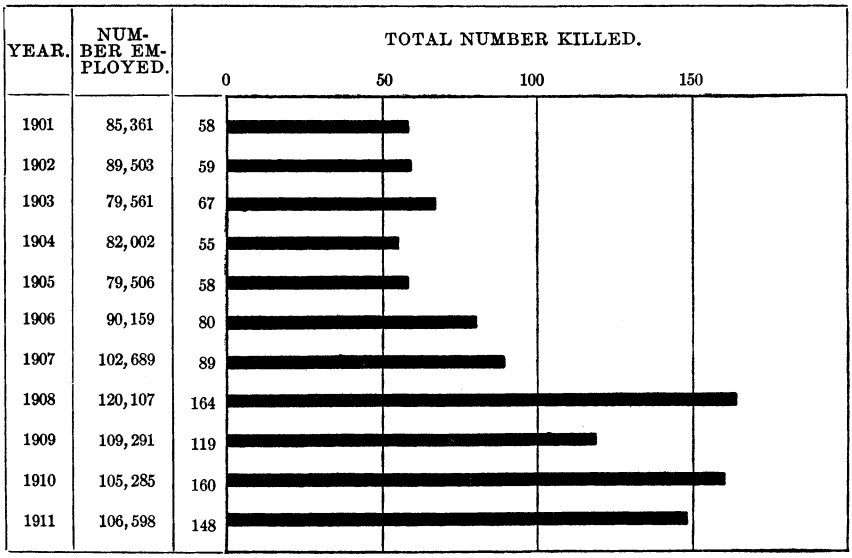


FIGURE 31.—Number killed in and about the coal mines of India, 1901 to 1911.

with fatalities classified according to cause. The official reports of the chief mine inspector do not include a classification of nonfatal

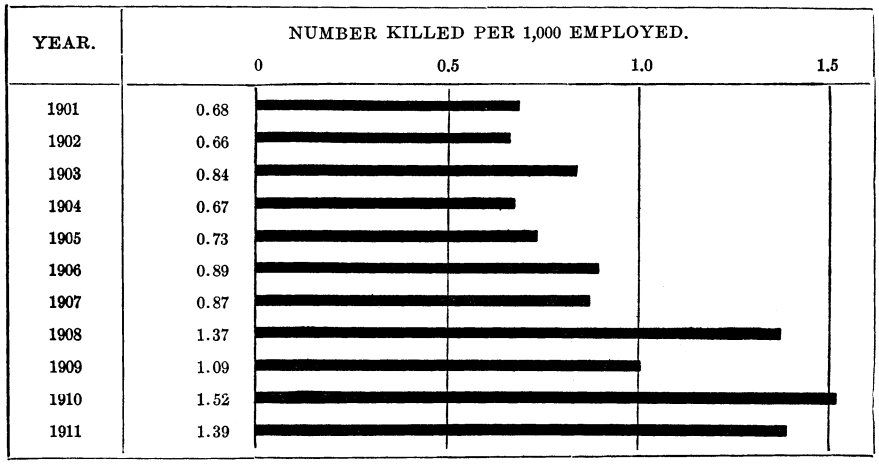


FIGURE 32.—Number killed per 1,000 employed in and about the coal mines of India, 1901 to 1911.

accidents, but state only that in 1911 there were 90 persons seriously injured, 69 below ground and 21 on the surface.

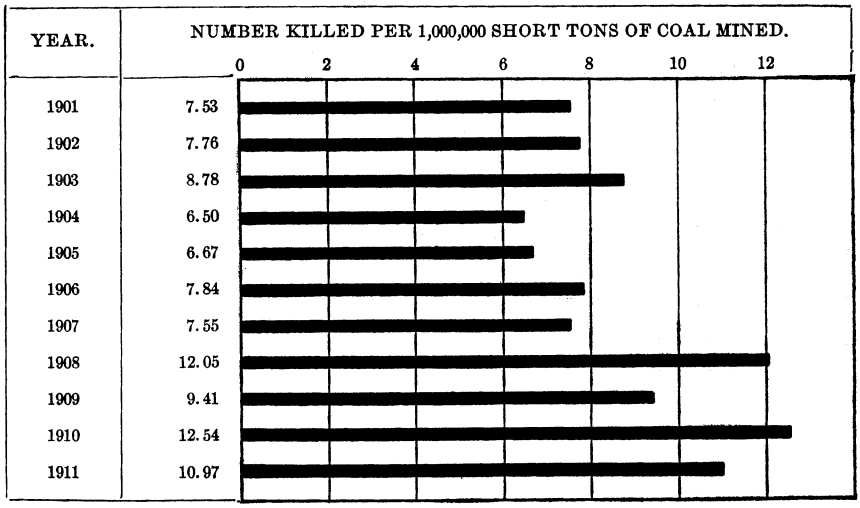


FIGURE 33.—Number killed per 1,000,000 short tons of coal mined in India, 1901 to 1911.

TABLE 31.—*Number killed in and about the coal mines of India in 1911, with the fatalities classified according to cause.* [a]

Cause.	Number killed.	Per cent of total number killed.
Falls of roof and coal	84	56.76
Haulage accidents (underground)	16	10.81
Gas and coal-dust explosions	16	10.81
Explosives (underground)	0	0.00
Other causes (underground)	6	4.05
Shaft accidents	12	8.11
Surface accidents	14	9.46
Total	148	100.00

[a] Data from Report of the Chief Inspector of Mines in India.

NEW SOUTH WALES.

Table 32 and figures 34, 35, and 36 show the number of persons killed in and about the coal mines of New South Wales during the years 1901 to 1911, in relation to the production and to the number of persons employed.

TABLE 32.—*Number killed in and about the coal mines of New South Wales, 1901 to 1911, in relation to the production and to the number of persons employed.* [a]

Year.	Production.		Number employed.	Number killed.			Production per death (short tons).
	Long tons.	Short tons.		Total.	Per 1,000 employed.	Per 1,000,000 short tons mined.	
1901	5,968,000	6,684,000	12,191	17	1.39	2.54	393,000
1902	5,942,000	6,655,000	12,815	105	8.19	15.78	63,000
1903	6,355,000	7,118,000	13,917	13	.93	1.83	548,000
1904	6,020,000	6,742,000	14,044	12	.85	1.78	562,000
1905	6,632,000	7,428,000	14,019	24	1.71	3.23	310,000
1906	7,626,000	8,541,000	14,929	21	1.41	2.46	407,000
1907	8,658,000	9,697,000	17,080	17	1.00	1.75	570,000
1908	9,147,000	10,245,000	17,734	21	1.18	2.05	488,000
1909	7,020,000	7,862,000	18,168	14	.77	1.78	562,000
1910	8,174,000	9,155,000	17,618	21	1.19	2.29	436,000
Average, 1901–1910	7,154,000	8,013,000	15,252	27	1.74	3.70	297,000
1911	8,692,000	9,735,000	17,375	15	86	1.54	649,000

[a] Data from Annual Report of the Department of Mines, New South Wales.

The number killed per 1,000 employed in 1911 (0.86) was lower than the corresponding rate for any other year under consideration, except 1904 and 1909, and the number killed per 1,000,000 short tons of coal mined (1.54) was less in 1911 than in any year during the decade 1901 to 1910.

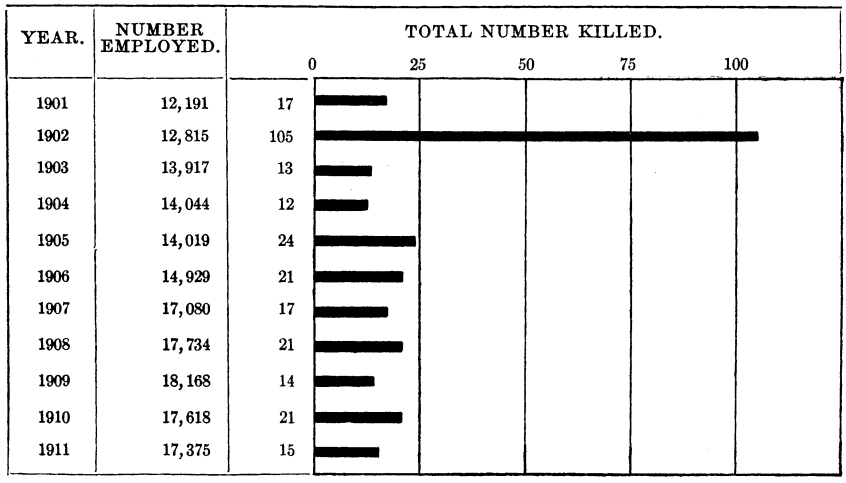


FIGURE 34.—Number killed in and about the coal mines of New South Wales, 1901 to 1911.

The unusually large number of persons killed in 1902 and the high death rates for that year were caused by a mine explosion at the Mount Kembla colliery, that resulted in 95 fatalities.

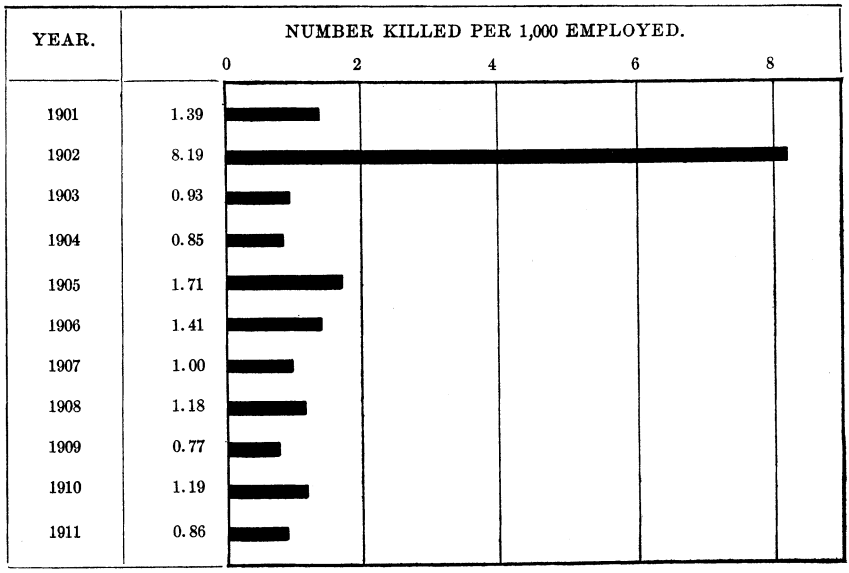


FIGURE 35.—Number killed per 1,000 employed in and about the coal mines of New South Wales, 1901 to 1911.

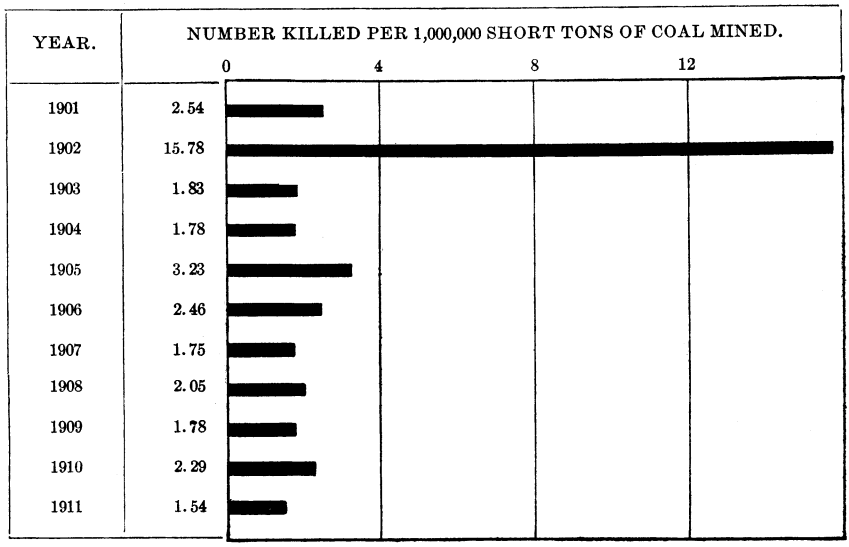


FIGURE 36.—Number killed per 1,000,000 short tons of coal mined in New South Wales, 1901 to 1911.

CANADA.

Coal mining in Canada is carried on almost entirely in Nova Scotia and British Columbia. It is not possible, however, to combine the statistics of coal-mine accidents for these two Provinces, as the reports of the former Province cover fiscal years ended September 30 while those of the latter are for calendar years.

Table 33 shows the number killed in and about the coal mines of Nova Scotia during the fiscal years 1901 to 1912, in relation to the production and to the number of persons employed. The death rates per 1,000 employed and per 1,000,000 short tons of coal mined during the 12 years covered by the table reached a maximum in 1908, when they were 3.63 and 6.66, respectively. Since that year there has been an improvement, and in 1912 the number killed per 1,000 employed was 2.63 and per 1,000,000 short tons of coal mined was 4.59, both of these rates being lower than those for any previous year since 1906, as well as lower than the average rates for the 10 years 1901 to 1910.

TABLE 33.—*Number killed in and about the coal mines of Nova Scotia, 1901 to 1912,*[a] *in relation to the production and to the number employed.*[b]

Year.	Production.		Number employed.	Number killed.			Production per death (short tons).
	Long tons.	Short tons.		Total.	Per 1,000 employed.	Per 1,000,000 short tons mined.	
1901	3,625,000	4,060,000	7,663	14	1.83	3.45	290,000
1902	4,367,000	4,891,000	8,062	21	2.60	4.29	233,000
1903	5,255,000	5,886,000	11,092	31	2.79	5.27	190,000
1904	5,247,000	5,877,000	11,659	27	2.32	4.59	218,000
1905	5,050,000	5,656,000	10,780	20	1.86	3.54	283,000
1906	5,867,000	6,571,000	12,113	28	2.31	4.26	235,000
1907	5,731,000	6,419,000	12,133	34	2.80	5.30	189,000
1908	6,299,000	7,055,000	12,933	47	3.63	6.66	150,000
1909	5,218,000	5,844,000	12,083	34	2.81	5.82	172,000
1910	5,477,000	6,134,000	11,001	31	2.82	5.05	198,000
Average 1901–1910	5,214,000	5,839,000	10,952	29	2.65	4.97	201,000
1911	6,208,000	6,953,000	12,522	36	2.87	5.18	193,000
1912	6,803,000	7,619,000	13,297	35	2.63	4.59	218,000

[a] Fiscal years, ending September 30.
[b] Data from Report of the Department of Mines, Province of Nova Scotia.

Table 34 shows the number of persons killed in and about the coal mines of British Columbia in relation to the production and to the number employed during the calendar years 1901 to 1911. It will be seen that the death rates per 1,000 employed and per 1,000,000 short tons of coal mined were extremely high in 1901 and 1902. They are accounted for by two disastrous mine explosions, one at the Union colliery on February 15, 1901, which killed 63 persons, and one at the Coal Creek mine on May 22, 1902, in which 127 persons lost their lives.

In 1911 the number killed per 1,000 employed (2.32) and the number killed per 1,000,000 short tons of coal mined (6.22) were lower than the corresponding rates for any other year covered by the table.

TABLE 34.—*Number killed in and about the coal mines of British Columbia, 1901 to 1911, in relation to the production and to the number employed.* [a]

Year.	Production.		Number employed.	Number killed.			Production per death (short tons).
	Long tons.	Short tons.		Total.	Per 1,000 employed.	Per 1,000,000 short tons mined.	
1901	1,692,000	1,895,000	3,974	102	25.67	53.83	19,000
1902	1,642,000	1,839,000	4,011	139	34.65	75.58	13,000
1903	1,482,000	1,660,000	4,264	42	9.85	25.30	40,000
1904	1,686,000	1,888,000	4,453	37	8.31	19.60	51,000
1905	1,826,000	2,045,000	4,407	12	2.72	5.87	170,000
1906	1,899,000	2,127,000	4,805	15	3.12	7.05	142,000
1907	2,220,000	2,486,000	6,059	31	5.12	12.47	80,000
1908	2,109,000	2,362,000	6,095	18	2.95	7.62	131,000
1909	2,401,000	2,689,000	6,418	57	8.88	21.20	47,000
1910	3,139,000	3,516,000	7,758	28	3.61	7.96	126,000
Average, 1901–1910	2,010,000	2,251,000	5,224	48	9.19	21.32	47,000
1911	2,298,000	2,574,000	6,873	16	2.32	6.22	161,000

[a] Data from Annual Report of the Minister of Mines, British Columbia.

PART III.

COMPARISON OF COAL-MINE ACCIDENTS IN THE UNITED STATES AND FOREIGN COUNTRIES.

Table 35 and Plate I show the number of fatalities in and about the coal mines of the principal coal-producing countries from 1901 to 1911, inclusive. It will be noted that there were more persons killed by coal-mine accidents in the United States than in either Great Britain or Germany combined with Japan, France, Belgium, Austria, India, and New South Wales. However, the number of fatalities in itself shows nothing in regard to the relative hazard of coal mining in the various countries, but is only of interest as showing the relative loss of life.

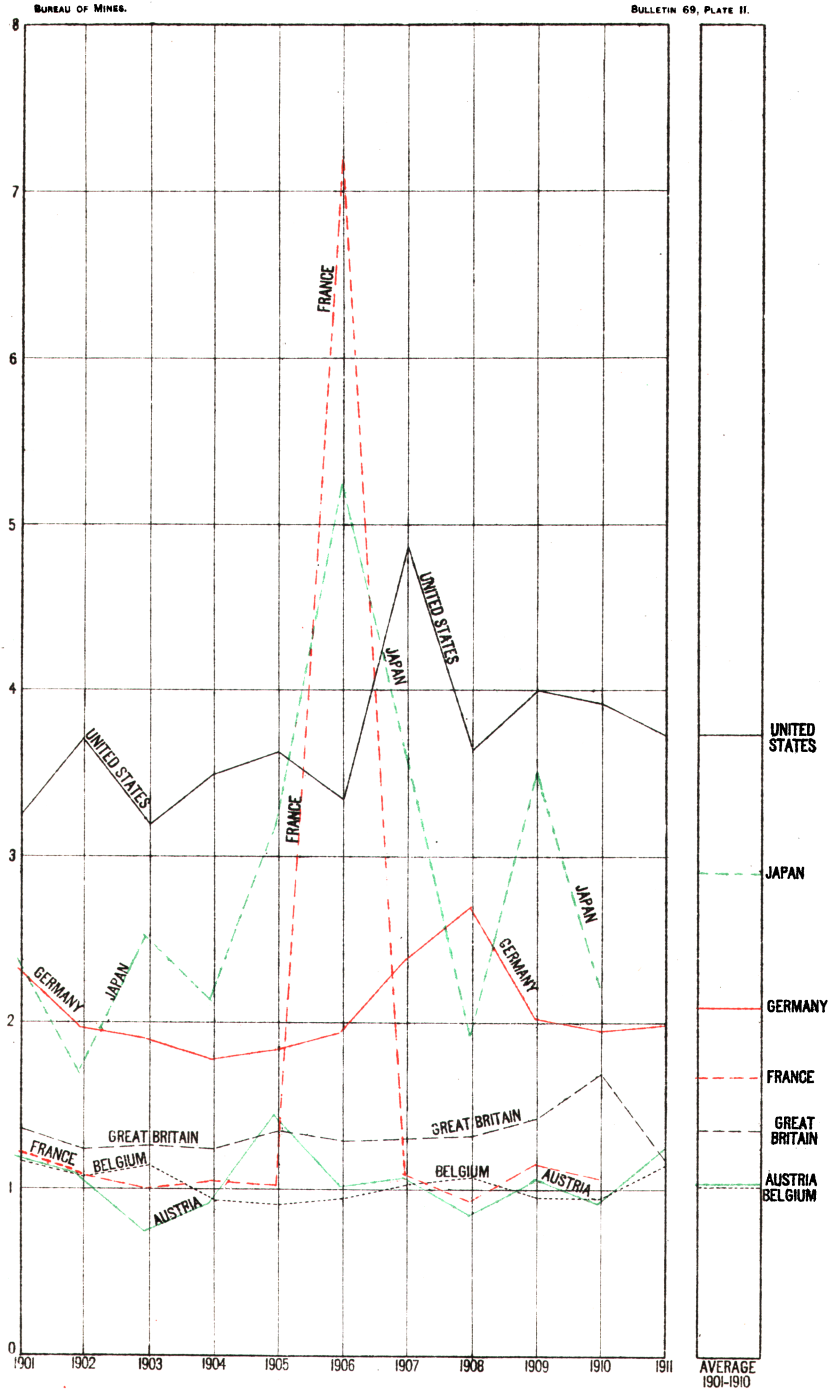
Figure 37 shows the average number killed in and about the coal mines of the principal coal-producing countries for the 10 years 1901 to 1910. The countries are listed in the order of the average number of persons killed, and it will be seen that this arrangement coincides with a classification according to the average number employed, except in the case of the United States and Japan. Although fewer men were employed, more men were killed by coal-mine accidents in the United States than in Great Britain, and a larger number was killed in the coal mines of Japan than in France or Belgium, although each of the latter countries employed more persons in and about its coal mines.

TABLE 35.—*Number killed in and about the coal mines of the principal coal-producing countries, 1901 to 1911.*

Year.	(1) United States.	(2) Great Britain.	(3) Germany.[a]	(4) Japan.	(5) France.	(6) Belgium.	(7) India.	(8) Austria.[a]	(9) New South Wales.
1901	1,549	1,075	956	180	198	157	58	84	17
1902	1,895	1,005	818	135	180	144	59	72	105
1903	1,752	1,048	826	215	170	159	67	49	13
1904	2,004	1,034	808	189	184	129	55	61	12
1905	2,232	1,138	840	256	182	123	58	96	24
1906	2,116	1,116	924	560	1,280	132	80	70	21
1907	3,197	1,216	1,206	468	202	147	89	75	17
1908	2,449	1,285	1,490	245	186	155	164	59	21
1909	2,668	1,424	1,165	535	223	136	119	75	14
1910	2,840	1,754	1,140	307	213	136	160	65	21
Average, 1901–1910	2,270	1,210	1,017	309	302	142	91	71	27
1911	2,719	1,232	1,176	.....	.....	165	148	88	15

[a] Figures based on fatalities in the bituminous and anthracite mines; fatalities in lignite mines not included.

Table 36 shows the number killed per 1,000 employed in and about the coal mines of the principal coal-producing countries from 1901



NUMBER KILLED PER 1,000 EMPLOYED IN AND ABOUT THE COAL MINES OF THE PRINCIPAL COAL-PRODUCING COUNTRIES, 1901-1911, INCLUSIVE.

THE NORRIS PETERS CO., WASHINGTON, D. C.

to 1911, inclusive, and the relative position in which the countries group themselves when classified on this basis. The rise and fall of the death rates in each of the countries is shown graphically in Plate II. It may be noted that only in one year, 1906, was the death rate

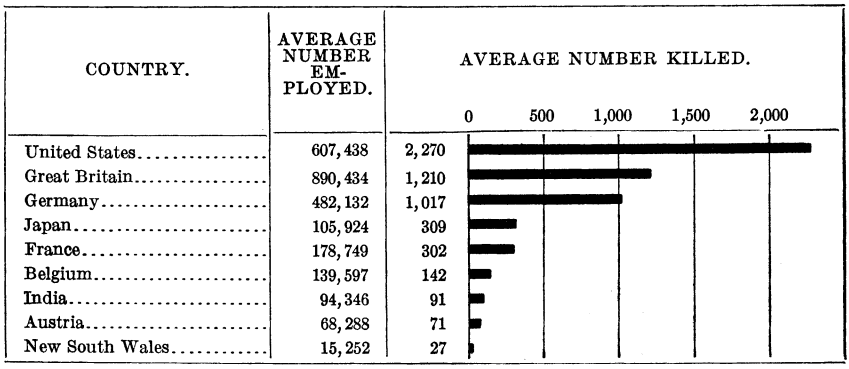


FIGURE 37.—Average number killed in and about the coal mines of the principal coal-producing countries, 1901 to 1910, inclusive.

in the United States exceeded by that in any other country. In this year exceptional disasters in the coal mines of both France and Japan raised their death rate per 1,000 employed to 7.17 and 5.25, as compared with a corresponding rate of 3.35 for the United States.

TABLE 36.—*Number killed per 1,000 employed in and about the coal mines of the principal coal-producing countries, 1901–1911, inclusive.*

Year.	(1) India.	(2) Belgium.	(3) Austria.[a]	(4) Great Britain.	(5) France.	(6) New South Wales.	(7) Germany[a].	(8) Japan.	(9) United States.
1901	0.68	1.17	1.19	1.36	1.21	1.39	2.34	2.39	3.25
1902	.66	1.07	1.08	1.24	1.09	8.19	1.99	1.71	3.71
1903	.84	1.14	.74	1.26	1.02	.93	1.92	2.53	3.20
1904	.67	.93	.92	1.24	1.07	.85	1.80	2.14	3.50
1905	.73	.91	1.45	1.35	1.04	1.71	1.86	3.22	3.63
1906	.89	.95	1.03	1.29	7.17	1.41	1.97	5.25	3.35
1907	.87	1.03	1.07	1.31	1.10	1.00	2.40	3.63	4.88
1908	1.37	1.07	.86	1.32	.95	1.18	2.71	1.93	3.64
1909	1.09	.95	1.07	1.43	1.17	.77	2.04	3.51	4.00
1910	1.52	.95	.93	1.70	1.08	1.19	1.97	2.23	3.92
Average, 1901–1910	.96	1.02	1.04	1.36	1.69	1.74	2.11	2.92	3.74
1911	1.39	1.15	1.26	1.17	.....	.86	2.00	.....	3.73

[a] Figures based on fatalities in the bituminous and anthracite mines; fatalities in lignite mines not included.

Figure 38 shows the average number of persons killed per 1,000 employed in and about the coal mines of the principal coal-producing countries for the 10 years 1901 to 1910. It may be seen from this figure and Plate II that the United States has the largest death rate per 1,000 employed of any of the countries enumerated. Next in order

come Japan, Germany, New South Wales, France, Great Britain, Austria, Belgium, and finally India with the lowest death rate of all.

As already stated, the number of men killed per 1,000 employed as calculated shows little in regard to the actual relative risk of the coal-mining industry in the various countries, although its use for determining that risk is a time-honored one. Comparisons on the basis of such a death rate may properly be made only in cases where the length of time the mines were in operation and the rate of production of coal per man in the coal fields under comparison are equal. For example, the risk of bituminous coal mining in Tennessee and Pennsylvania in 1911 may be justly compared on the basis of the death rate per 1,000 employed, because in these States the mines were operated about the same length of time, 236 and 233 days, respectively, and the average production of coal per day per man was approximately

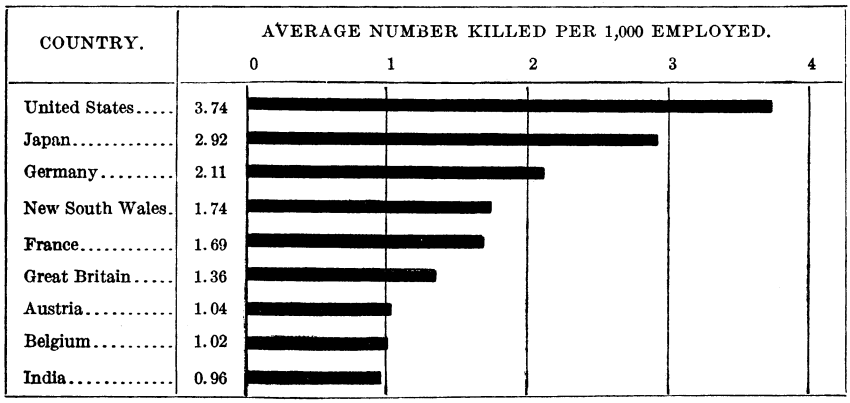


FIGURE 38.—Average number killed per 1,000 employed in and about the coal mines of the principal coal-producing countries, 1901–1910, inclusive.

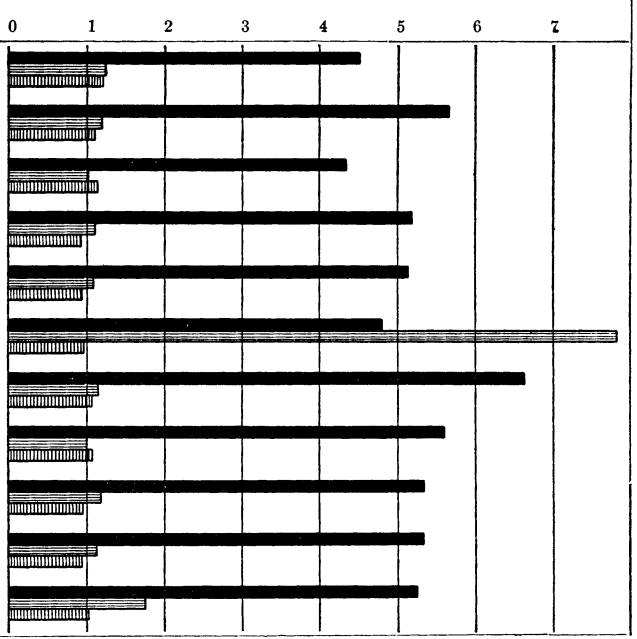
the same, 3.48 and 3.69 tons. It would, however, be manifestly unfair to make a comparison of the risks of the coal-mining industry in Belgium and the United States on this basis; first, because in Belgium the coal mines are operated about 80 days more than in the United States, which means that the Belgian miner is exposed to risk for that much longer period, and, second, because the coal miner in the United States produces about five times as much coal in a day as the Belgian miner and, on account of his greater speed of work, is subjected to a greater risk. It is evident that the death rate per 1,000 employed can be corrected to take into account the time of operation, because the risk varies directly with the time of exposure to such risk. It is, however, impossible to apply such a correction to cover the rate of production, for although the risk varies with the speed of work it evidently does not vary directly in proportion to it.

In any given coal field or in any two coal fields having identical physical conditions—that is, the same thickness of coal seams, the same depth of seams below the surface, similar roof, and the same conditions regarding gas, etc.—the risk of coal mining would vary almost directly with the average output of coal per day per man. For example, with twice the production there would be twice as much roof exposed, twice the amount of explosives used, and twice as much coal hauled and hoisted, and the dangers from these sources would therefore be approximately doubled. In like manner almost all of the other dangers to which the coal miner is subjected would be similarly increased. In making a comparison between coal fields where the physical conditions are not identical, however, the comparative risk does not vary directly with the rate of production. For example, in the production of a given tonnage of coal from a seam 3 feet thick twice as much roof is uncovered and the miner exposed to twice the danger from falls as in the case of the same production from a seam 6 feet thick. It is evident that other physical conditions, such as the depth of the coal seams below the surface, dip of the seams, character of roof, etc., all have a direct bearing on the variation of the comparative risk with the rate of production, but it is also apparent that their influence is too complex to be determined. However, it is evident that the rate of production is an important element in determining the relative risk of coal mining and that it should be taken into consideration.

The United States, France, and Belgium are the only large coal-producing countries for which official figures are available as to the number of days the coal mines were in actual operation. The influence that a correction for the duration of exposure to risk has on the fatality rate per 1,000 employed is set forth in figure 39. This figure shows the number of days actually worked in the mines of the three countries from 1901 to 1910, the number killed per 1,000 employed, and the number killed per 1,000 employed calculated on a basis of a year of 300 working days. Of course such a comparison emphasizes the relatively high death rate per 1,000 employed in and about the coal mines of the United States, but it must be remembered that the corrected rates do not in any way take into account the daily production of coal per man, which is enormously greater in the United States than in either France or Belgium, and do not as nearly illustrate the relative risks of coal mining in the three countries as the original rates did.

Table 37 shows the average production, number employed, number of days worked, and fatality rates per 1,000 employed in and about the coal mines of the United States, France, and Belgium for the 10 years 1901 to 1910. The death rates in the last column of the table

YEAR.	COUNTRY.	NUMBER OF DAYS ACTUALLY WORKED.	NUMBER KILLED PER 1,000 EMPLOYED.	NUMBER KILLED PER 1,000 EMPLOYED CALCULATED ON THE BASIS OF A YEAR OF 300 WORKING DAYS.
1901	United States	216	3.25	4.51
	France	290	1.21	1.25
	Belgium	290	1.17	1.21
1902	United States	197	3.71	5.65
	France	272	1.09	1.20
	Belgium	291	1.07	1.10
1903	United States	220	3.20	4.36
	France	295	1.02	1.03
	Belgium	297	1.14	1.15
1904	United States	202	3.50	5.19
	France	289	1.07	1.11
	Belgium	297	.93	.94
1905	United States	212	3.63	5.13
	France	289	1.08	1.08
	Belgium	289	.91	.95
1906	United States	209	13.35	4.81
	France	275	7.17	7.83
	Belgium	292	.95	.97
1907	United States	231	4.88	6.33
	France	287	1.10	1.15
	Belgium	294	1.03	1.05
1908	United States	195	3.64	5.60
	France	285	.95	1.00
	Belgium	295	1.07	1.08
1909	United States	a 225	4.00	5.34
	France	295	1.17	1.19
	Belgium	299	.95	.95
1910	United States	220	3.92	5.34
	France	290	1.08	1.12
	Belgium	298	.95	.95
Average, 1901–1910	United States	213	3.74	5.26
	France	287	1.69	1.76
	Belgium	294	1.02	1.04



a Estimated.

FIGURE 39.—Number killed per 1,000 employed in and about the coal mines of the United States, France, and Belgium.

have been calculated on the assumption that if each coal miner in France and Belgium had made the same daily output as each coal miner in the United States the hazard of the industry would have been increased proportionately. Of course this assumption is not true, because the physical conditions in the coal mines of France and Belgium do not even approximate those in the United States, and the correction that has been applied is without doubt too large. However, the figures are submitted for what they are worth.

TABLE 37.—*Average production, number employed, number of days worked, and fatality rates per 1,000 employed in the coal mines of the United States, France, and Belgium for the ten years 1901 to 1910.*

Country.	Average number employed.	Average number of days mines were operated each year.	Average production (short tons).		Average fatality rate per 1,000 employed.		
			Total.	Per day per man.	Actual.	On the basis of a year of 300 working days.	On the basis of equal daily production per man.[a]
United States	607,438	213	389,269,000	3.01	3.74	5.26	5.26
France	178,749	287	38,785,000	.76	1.69	1.76	7.01
Belgium	139,597	294	25,540,000	.62	1.02	1.04	5.03

[a] Calculated on the assumption that if each coal miner in France and Belgium had made the same daily output as each coal miner in the United States, the hazard of the industry would have been increased proportionately.

Table 38, figure 40, and Plate III show the number killed per 1,000,000 short tons of coal mined in the principal coal-producing

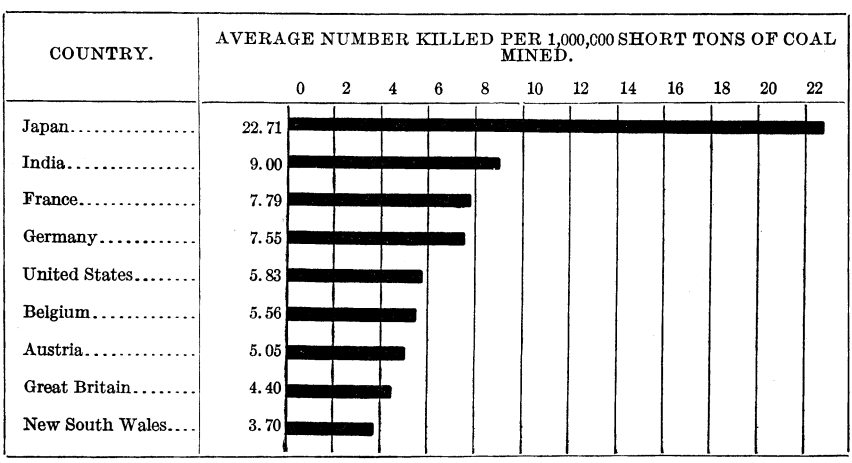


FIGURE 40.—Average number killed per 1,000,000 short tons of coal mined in the principal coal-producing countries, 1901 to 1910.

countries from 1901 to 1911, inclusive, and the average fatality rate from 1901 to 1910.

It will be noted that the number killed per 1,000,000 short tons of coal mined in the United States is greater than in Great Britain, Belgium, Austria, and New South Wales, but less than in Germany, France, India, and Japan.

A comparison of the relative risk of coal mining on the basis of production seems to the writer to be the fairest that can be drawn. It not only indirectly takes into account the length of time the mines were in operation but also the average production of the individual workman in a given unit of time.

TABLE 38.—*Number killed per 1,000,000 short tons of coal mined in the principal coal-producing countries, 1901 to 1911.*

Year.	(1) New South Wales.	(2) Great Britain.	(3) Austria.[a]	(4) Belgium.	(5) United States.	(6) Germany.[a]	(7) France.	(8) India.	(9) Japan.
1901	2.54	4.38	6.49	6.41	**5.37**	8.56	5.56	7.53	18.11
1902	15.78	3.95	5.91	5.71	**6.39**	7.40	5.44	7.76	12.62
1903	1.83	4.06	3.87	6.06	**5.08**	6.88	4.42	8.78	19.33
1904	1.78	3.97	4.66	5.14	**5.91**	6.49	4.89	6.50	15.99
1905	3.23	4.30	6.92	5.12	**5.78**	6.73	4.60	6.67	20.12
1906	2.46	3.97	4.71	5.08	**5.19**	6.52	33.96	7.84	39.14
1907	1.75	4.05	4.91	5.63	**6.93**	8.15	4.99	7.55	30.76
1908	2.05	4.39	3.86	5.97	**6.05**	9.71	4.51	12.05	14.99
1909	1.78	4.82	4.96	5.25	**5.79**	7.54	5.35	9.41	32.25
1910	2.29	5.92	4.28	5.16	**5.66**	7.18	5.04	12.54	17.76
Average, 1901–1910.	3.70	4.40	5.05	5.56	**5.83**	7.55	7.79	9.00	22.71
1911	1.54	4.05	5.55	6.49	**5.48**	7.04	.....	10.97	.....

[a] Figures are based on fatalities in the bituminous and anthracite mines; fatalities in lignite mines are not included.

It should be stated that a comparison on the production basis of the United States with foreign countries is unjust to the other countries because it is admitted that the physical conditions concomitant with the coal-mining industry of the foreign countries are not nearly as favorable to the easy extraction of coal as in this country. On the other hand, a comparison on the basis of the number killed per 1,000 employed is more unfair to the United States with its enormously greater daily output of coal per man. Of the two comparisons the one on the basis of production is nearer the truth, and for that reason to be preferred. Furthermore, it may be stated that although the physical conditions of the coal deposits in the United States are more favorable for the safe mining of coal than in any of the foreign countries enumerated, a careful analysis of the statistics given in the preceding tables indicates that the danger of the industry in the United States is greater than in Great Britain, Belgium, Austria, or New South Wales, but not as great as in Germany, France, India, or Japan.

Table 39 shows the number killed, and the number killed per 1,000 employed, in and about the coal mines of the principal coal-producing countries classified according to cause. The table is of interest as

showing the relative death rate from different classes of accidents in the various countries.

TABLE 39.—*Number killed, and the number killed per 1,000 employed, in and about the coal mines of the principal coal-producing countries, with the fatalities classified according to cause.*

Cause.	(1) United States, 1911.	(2) Japan, 1910.	(3) Germany, 1911.	(4) India, 1911.	(5) Austria, 1911.	(6) Great Britain, 1911.	(7) Belgium, 1911.	(8) France, 1910.
Falls of roof or coal:								
Total number killed	**1,321**	198	442	84	.....	599	56	81
Number killed per 1,000 employed	**1.81**	1.44	0.75	0.79	.....	0.57	0.39	0.41
Haulage accidents (underground):								
Total number killed	**393**	37	181	16	.....	256	27	28
Number killed per 1,000 employed	**0.54**	0.27	0.31	0.15	.....	0.24	0.19	0.14
Gas and coal-dust explosions:								
Total number killed	**379**	8	32	16	.....	34	1	9
Number killed per 1,000 employed	**0.52**	0.06	0.06	0.15	.....	0.03	0.01	0.04
Explosives (underground):								
Total number killed	**134**	1	43	0	.....	16	8	3
Number killed per 1,000 employed	**0.18**	0.01	0.07	0.00	.....	0.02	0.06	0.02
Other causes (underground):								
Total number killed	**246**	31	219	6	[a] 63	81	23	16
Number killed per 1,000 employed	**0.34**	0.22	0.37	0.06	[a] 0.90	0.08	0.16	0.08
Shaft accidents:								
Total number killed	**63**	18	102	12	12	99	29	37
Number killed per 1,000 employed	**0.09**	0.13	0.17	0.11	0.17	0.09	0.20	0.19
Surface accidents:								
Total number killed	**183**	14	157	14	13	147	21	39
Number killed per 1,000 employed	**0.25**	0.10	0.27	0.13	0.19	0.14	0.14	0.20
Total number killed	**2,719**	307	1,176	148	88	1,232	165	213
Number killed per 1,000 employed	**3.73**	2.23	2.00	1.39	1.26	1.17	1.15	1.08

[a] Includes all fatalities underground.

STATISTICS OF COAL-MINE FATALITIES IN THE UNITED STATES AND FOREIGN COUNTRIES FOR EACH YEAR FROM 1901 TO 1911, INCLUSIVE.

The following tables show the number of persons killed in and about the coal mines of the principal coal-producing countries for each year from 1901 to 1911 in relation to the production and to the number of persons employed, with the countries enumerated in the order of their coal production:

TABLE 40.—*Number killed in and about the coal mines of the principal coal-producing countries, in relation to the production and to the number employed.*

1901.

Countries.	Production (short tons).	Number employed.	Number killed.			Production per death (short tons).
			Total.	Per 1,000 employed.	Per 1,000,000 short tons mined.	
United States	288,723,000	476,655	1,549	3.25	5.37	186,000
Great Britain	245,321,000	792,648	1,075	1.36	4.38	228,000
Germany [a]	111,732,000	408,375	956	2.34	8.56	117,000
France	35,632,000	163,796	198	1.21	5.56	180,000
Belgium	24,486,000	134,092	157	1.17	6.41	156,000
Austria [a]	12,940,000	70,344	84	1.19	6.49	154,000
Japan	9,941,000	75,230	180	2.39	18.11	55,000
India	7,702,000	85,361	58	.68	7.53	133,000
New South Wales	6,684,000	12,191	17	1.39	2.54	393,000

1902.

United States	296,687,000	510,437	1,895	3.71	6.39	157,000
Great Britain	254,335,000	810,787	1,005	1.24	3.95	253,000
Germany [a]	110,532,000	411,323	818	1.99	7.40	135,000
France	33,066,000	164,810	180	1.09	5.44	184,000
Belgium	25,218,000	134,889	144	1.07	5.71	175,000
Austria [a]	12,175,000	66,582	72	1.08	5.91	169,000
Japan	10,695,000	78,894	135	1.71	12.62	79,000
India	7,606,000	89,503	59	.66	7.76	129,000
New South Wales	6,655,000	12,815	105	8.19	15.78	63,000

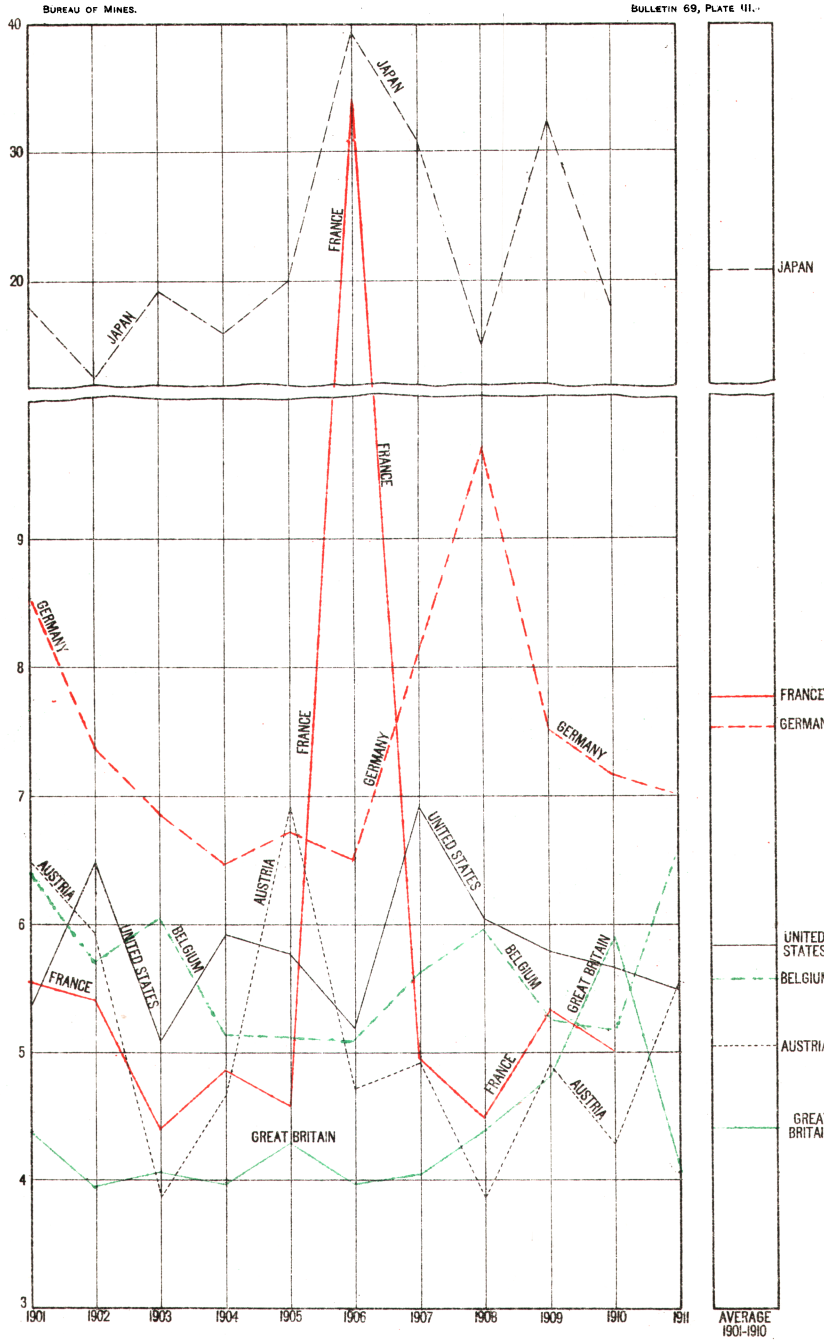
1903.

United States	345,200,000	547,431	1,752	3.20	5.08	197,000
Great Britain	257,963,000	828,968	1,048	1.26	4.06	246,000
Germany [a]	120,133,000	429,837	826	1.92	6.88	145,000
France	38,477,000	167,213	170	1.02	4.42	226,000
Belgium	26,232,000	139,592	159	1.14	6.06	165,000
Austria [a]	12,674,000	66,663	49	.74	3.87	259,000
Japan	11,121,000	84,941	215	2.53	19.33	52,000
India	7,631,000	79,561	67	.84	8.78	114,000
New South Wales	7,118,000	13,917	13	.93	1.83	548,000

1904.

United States	339,165,000	573,373	2,004	3.50	5.91	169,000
Great Britain	260,301,000	833,629	1,034	1.24	3.97	252,000
Germany [a]	124,488,000	449,160	808	1.80	6.49	154,000
France	37,664,000	171,792	184	1.07	4.89	205,000
Belgium	25,090,000	138,567	129	.93	5.14	194,000
Austria [a]	13,082,000	66,507	61	.92	4.66	214,000
Japan	11,821,000	88,330	189	2.14	15.99	63,000
India	8,468,000	82,002	55	.67	6.50	154,000
New South Wales	6,742,000	14,044	12	.85	1.78	562,000

[a] Figures are those for bituminous and anthracite mines; figures for lignite mines not included.



NUMBER KILLED PER MILLION SHORT TONS OF COAL MINED IN THE PRINCIPAL COAL-PRODUCING COUNTRIES, 1901-1911, INCLUSIVE.

THE NORRIS PETERS CO., WASHINGTON, D. C.

TABLE 40.—*Number killed in and about the coal mines of the principal coal-producing countries, in relation to the production and to the number employed*—Continued.

Countries.	Production (short tons).	Number employed.	Number killed.			Production per death (short tons).
			Total.	Per 1,000 employed.	Per 1,000,000 short tons mined.	
1905.						
United States	386,379,000	615,628	2,232	3.63	5.77	173,000
Great Britain	264,444,000	843,418	1,138	1.35	4.30	232,000
Germany [a]	124,768,000	452,151	840	1.86	6.73	149,000
France	39,604,000	175,074	182	1.04	4.60	218,000
Belgium	24,003,000	134,747	123	.91	5.12	195,000
Austria [a]	13,873,000	66,072	96	1.45	6.92	145,000
Japan	12,723,000	79,505	256	3.22	20.12	50,000
India	8,702,000	79,506	58	.73	6.67	150,000
New South Wales	7,428,000	14,019	24	1.71	3.23	310,000
1906.						
United States	407,835,000	631,086	2,116	3.35	5.19	193,000
Great Britain	281,177,000	867,152	1,116	1.29	3.97	252,000
Germany [a]	141,639,000	469,700	924	1.97	6.52	153,000
France	37,695,000	178,431	1,280	7.17	33.96	29,000
Belgium	25,981,000	139,394	132	.95	5.08	197,000
Austria [a]	14,851,000	68,115	70	1.03	4.71	212,000
Japan	14,308,000	106,589	560	5.25	39.14	26,000
India	10,207,000	90,159	80	.89	7.84	128,000
New South Wales	8,541,000	14,929	21	1.41	2.46	407,000
1907.						
United States	461,406,000	655,418	3,197	4.88	6.93	144,000
Great Britain	299,951,000	925,097	1,216	1.31	4.05	247,000
Germany [a]	147,984,000	503,227	1,206	2.40	8.15	123,000
France	40,514,000	183,862	202	1.10	4.99	201,000
Belgium	26,130,000	142,699	147	1.03	5.63	178,000
Austria [a]	15,267,000	69,995	75	1.07	4.91	204,000
Japan	15,216,000	128,772	468	3.63	30.76	33,000
India	11,789,000	102,689	89	.87	7.55	132,000
New South Wales	9,697,000	17,080	17	1.00	1.75	570,000
1908.						
United States	404,933,000	672,794	2,449	3.64	6.05	165,000
Great Britain	292,893,000	972,232	1,285	1.32	4.39	228,000
Germany [a]	153,448,000	549,753	1,490	2.71	9.71	103,000
France	41,209,000	194,980	186	.95	4.51	222,000
Belgium	25,968,000	145,277	155	1.07	5.97	168,000
Japan	16,342,000	126,999	245	1.93	14.99	67,000
Austria [a]	15,295,000	68,477	59	.86	3.86	259,000
India	13,607,000	120,107	164	1.37	12.05	83,000
New South Wales	10,245,000	17,734	21	1.18	2.05	488,000
1909.						
United States	460,761,000	666,523	2,668	4.00	5.79	173,000
Great Britain	295,410,000	997,708	1,424	1.43	4.82	207,000
Germany [a]	154,431,000	570,528	1,165	2.04	7.54	133,000
France	41,711,000	190,748	223	1.17	5.35	187,000
Belgium	25,924,000	143,011	136	.95	5.25	191,000
Japan	16,588,000	152,515	535	3.51	32.25	31,000
Austria [a]	15,116,000	70,159	75	1.07	4.96	202,000
India	12,649,000	109,291	119	1.09	9.41	106,000
New South Wales	7,862,000	18,168	14	.77	1.78	562,000

[a] Figures are those for bituminous and anthracite mines; figures for lignite mines not included.

TABLE 40.—*Number killed in and about the coal mines of the principal coal-producing countries, in relation to the production and to the number employed*—Continued.

1910.

Countries.	Production (short tons).	Number employed.	Number killed.			Production per death (short tons).
			Total.	Per 1,000 employed	Per 1,000,000 short tons mined.	
United States	501,596,000	725,030	2,840	3.92	5.66	177,000
Great Britain	296,148,000	1,032,702	1,754	1.70	5.92	169,000
Germany [a]	158,694,000	577,263	1,140	1.97	7.18	139,000
France	42,274,000	196,786	213	1.08	5.04	198,000
Belgium	26,364,000	143,701	136	.95	5.16	194,000
Japan	17,285,000	137,467	307	2.23	17.76	56,000
Austria [a]	15,183,000	69,969	65	.93	4.28	234,000
India	12,755,000	105,285	160	1.52	12.54	80,000
New South Wales	9,155,000	17,618	21	1.19	2.29	436,000

1911.

United States	496,000,000	728,348	2,719	3.73	5.48	183,000
Great Britain	304,503,000	1,049,897	1,232	1.17	4.05	247,000
Germany [a]	167,022,000	586,538	1,176	2.00	7.04	142,000
France						
Belgium	25,412,000	144,054	165	1.15	6.49	154,000
Japan						
Austria [a]	15,851,000	69,827	88	1.26	5.55	180,000
India	13,495,000	106,598	148	1.39	10.97	91,000
New South Wales	9,735,000	17,375	15	.86	1.54	649,000

[a] Figures are those for bituminous and anthracite mines; figures for lignite mines not included.

PUBLICATIONS ON MINE ACCIDENTS AND METHODS OF MINING.

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BULLETIN 10. The use of permissible explosives, by J. J. Rutledge and Clarence Hall. 1912. 34 pp., 5 pls., 4 figs.

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