PART IV. MINE SAFETY

EMPLOYMENT AND ACCIDENTS IN THE MINERAL INDUSTRIES

By W. W. Adams

SUMMARY OUTLINE

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Increased employment, as shown by a larger number of men working and more man-hours of work performed, was an outstanding feature of the mining and quarrying industries of the United States in 1936 and 1937 compared with 1935. Approximately 48,000 more men were employed in 1936 than in 1935, and a further gain of 31,000 was made in 1937. Accidents to employees while at work were less frequent in both years in proportion to the number of man-hours worked than in 1935, although the accident rate was slightly higher in 1937 than in 1936.

In the absence of complete reports covering all mineral establishments these statements are based on reports received by the Bureau of Mines from identical mines and quarries that were in operation each of the past 3 years and that employed 47 percent of the total number of men working at all mines and quarries in the United States in 1935. The records covering identical establishments were supplemented by complete reports for 1936 from all operators of anthracite mines, iron-ore mines, stone quarries, cement mills, and limekilns. The group trend of employment in these industries is shown in figure 1.

This paper does not cover the milling, smelting, and coking industries, figures for which will be published later in bulletin form by the Bureau of Mines, nor the petroleum and natural-gas industries for which 1936 and 1937 employment and accident data are not available.

A summary table showing number of men employed, number of man-days worked, number of men killed by accidents, and yearly fatality rates for the mining and quarrying industries from 1911 to 1935 was published in Minerals Yearbook, 1937 (p. 1454). The fol-
The following table contains similar data for 1933 to 1937, with additional figures showing the number of nonfatal injuries and the nonfatal-injury rates. The figures for 1936 and 1937 have been estimated and are therefore subject to revision when final and complete data become available.

The trends of accidents, fatal and nonfatal, at mines and quarries in the United States are shown in figures 2 and 3.

**Employment and accident record of the mining and quarrying industries in the United States, 1933–37**

<table>
<thead>
<tr>
<th>Year</th>
<th>Men employed</th>
<th>Man-days worked</th>
<th>Man-hours worked</th>
<th>Men killed</th>
<th>Men Injured</th>
</tr>
</thead>
<tbody>
<tr>
<td>1933</td>
<td>642,125</td>
<td>112,229,996</td>
<td>901,176,268</td>
<td>1,218</td>
<td>70,875</td>
</tr>
<tr>
<td>1934</td>
<td>697,420</td>
<td>131,771,709</td>
<td>980,835,988</td>
<td>1,402</td>
<td>79,824</td>
</tr>
<tr>
<td>1935</td>
<td>736,521</td>
<td>135,547,329</td>
<td>1,003,943,593</td>
<td>1,457</td>
<td>79,933</td>
</tr>
<tr>
<td>1936</td>
<td>779,000</td>
<td>163,700,000</td>
<td>1,195,500,000</td>
<td>1,048</td>
<td>51,204</td>
</tr>
<tr>
<td>1937</td>
<td>810,000</td>
<td>168,000,000</td>
<td>1,222,900,000</td>
<td>1,904</td>
<td>56,582</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year</th>
<th>Average workdays per man per year</th>
<th>Average workhours per man</th>
<th>Death rate per million manhours</th>
<th>Injury rate per million manhours</th>
</tr>
</thead>
<tbody>
<tr>
<td>1933</td>
<td>175</td>
<td>1,406</td>
<td>8.03</td>
<td>1.35</td>
</tr>
<tr>
<td>1934</td>
<td>189</td>
<td>1,406</td>
<td>7.44</td>
<td>1.43</td>
</tr>
<tr>
<td>1935</td>
<td>197</td>
<td>1,374</td>
<td>7.35</td>
<td>1.45</td>
</tr>
<tr>
<td>1936</td>
<td>210</td>
<td>1,385</td>
<td>7.30</td>
<td>1.38</td>
</tr>
<tr>
<td>1937</td>
<td>207</td>
<td>1,510</td>
<td>7.28</td>
<td>1.48</td>
</tr>
</tbody>
</table>

1 Subject to revision.

As indicated, the mining and quarrying industries, considered as a group, made progress in accident prevention in 1936 and 1937 compared with 1935. The improvement in 1936 over 1935 was significant; the accident-frequency rate was reduced 5 percent per million man-hours of exposure to occupational hazards, the rate of 81.6 for 1935 being lowered to 77.7 in 1936. The rate increased in 1937, but re-
mained lower than in 1935, according to preliminary reports. The statistical position of bituminous mining as regards safety improved both in 1936 and 1937 compared with 1935, but the record was less favorable in 1937 than in 1936. Safety in anthracite mining, on the other hand, lost ground during 1936 and 1937. The trend in accidents at metal mines was also upward, but the record for lead and zinc mining improved. Higher rates were reported for the quarrying industries as a group, including the cement industry, whose rates, although increasing in 1936 and 1937, continued to be lower than those for other quarrying industries. The trend in accidents for nonmetallic-mineral mines other than coal mines was downward. Of
the 17 groups of mines and quarries for which separate data were compiled, 8 had lower accident rates in 1936 than in 1935; these included 68 percent of the total number of men employed in 1936. Similarly, 6 of the 17 groups had lower rates in 1937 than in 1936, but these included only 9 percent of the total number of men employed by all groups in 1937. The net reduction in the rate for 1936 from that of the previous year for all groups combined was 3.7 accidents per million man-hours of exposure. The tentative rate for 1937 increased 3.3 accidents per million man-hours over the rate for 1936 and was less than 1 point lower than the rate for 1935.

The frequency rate per million man-hours of exposure for fatal accidents was reduced from 1.47 in 1935 to 1.38 (tentative) in 1936; this was followed by a higher rate (1.48, tentative) in 1937. The rate for nonfatal injuries was reduced from 80.1 in 1935 to 76.4 (tentative) in 1936, followed by an increase to 81.0 (tentative) in 1937.

The reduction in accident frequency in 1936 and the increase in 1937 over 1936, although not to the 1935 level, were accompanied by material increases in the number of men employed. In other words, exposure to mining and quarrying hazards was much greater in the past 2 years than in 1935. Nevertheless, the accident rate per unit of exposure was lower or more favorable in 1936 and 1937 than in 1935, although it was higher in 1937 than in 1936. Bringing back former employees into the mines and quarries and taking on new employees sometimes causes an upward trend in the accident rate, partly owing to the inexperience of the new employees and the diminished alertness of former employees who have been temporarily idle. While the reduction in the accident rate in 1936 was gratifying to all persons interested in safety, the upward turn of the accident curve in 1937 should be accepted as a warning and an indication of the need for increasing care for the safety of employees as employment conditions improve.

EMPLOYMENT AND ACCIDENTS

ANTHRACITE MINES

Employment.—Complete reports covering anthracite mines in Pennsylvania for 1936 and incomplete returns from the companies for 1937 showed approximately the same number of men working in 1936 and 1937 as in 1935. A slight gain was reported in the total number of man-shifts worked in 1936 over 1935, but this was followed by an apparent loss in 1937, when fewer man-shifts were worked than in 1935 and 1936. A more pronounced decline was reported in the total number of man-hours of work done in 1937, due partly to a reduction in the number of days on which the mines were active but more to a shortening of the standard workday by an agreement between the companies and miners, which became effective on May 1, 1937. Under this agreement the workday was changed from 8 to 7 hours. Final figures for 1936 showed that the average employee worked 1,533 hours during the year; this was 35 hours per man more than in 1935. An appreciable shortening of the workyear, perhaps by as much as 200 hours per man, was indicated by incomplete figures for 1937.

Employees in 1936 totaled 102,082 men, only 766 less than the 102,848 men employed in 1935. Partial returns now available indi-
cate that approximately 102,000 men were employed in 1937. The total number of man-hours worked, stated in millions, was 154.1 in 1935, 156.5 in 1936, and approximately 134.1 in 1937. The figure for 1937 was indicated by incomplete reports, and it may be increased slightly when final reports for the year are received.

Accidents.—The number of men killed by accidents in and about the anthracite mines of Pennsylvania declined in 1936 and again in 1937. The fatality rate per million man-hours of exposure also declined in 1936. It increased in 1937 but not to as high a figure as that for 1935; the increase for 1937, in the face of fewer deaths, was due to the reduction in the total man-hours of employment in 1937. The fatality rate, which was 1.78 per million man-hours of exposure in 1935, fell to 1.56 in 1936 and rose to 1.66 in 1937. Nonfatal injuries, on the other hand, were more numerous in 1936 than in 1935 and declined in 1937 to a figure lower than that for either 1935 or 1936, yet their frequency rate per million man-hours (117.1 in 1935) increased in both 1936 and 1937 to 121.8 and 129.2, respectively. The latter figure is subject to revision when all operators have reported.

BITUMINOUS-COAL MINES

Employment.—Bituminous-coal mining in the United States added 28,000 men to its employment roll in 1936 compared with 1935 and 8,000 more men in 1937, according to reports from operating companies representing about 53 percent of the total employment in the industry. Gains were also reported in the total number of man-hours worked in the industry during 1936 and 1937. Employees averaged 202 days of work per man in 1936 and 197 days in 1937 compared with 178 in 1935.

Accidents.—The gratifying gains in employment at bituminous-coal mines in 1936 and 1937 were accompanied by an unfortunate increase in the number of fatal and nonfatal injuries to the workers. It is to be expected that where more men are employed more accidents will occur because of the larger volume of exposure to mining hazards. However, it is also to be expected that companies will recognize the necessity of more and better accident-prevention measures as new employees are taken into service and that accidents will not be allowed to rise proportionately as the number of employees mounts. This expectation was realized in 1936, when the accident-frequency rate for fatal and nonfatal injuries was reduced to 76.1 per million man-hours of exposure from the rate of 85.3 in 1935. The increase in employment in 1937, however, was accompanied by a higher accident rate, the estimated frequency being 79.7 accidents per million hours. This rate, although worse than that for 1936, compared favorably with the rate for 1935. Contrasted with these figures, which cover both fatal and nonfatal injuries, are the figures covering fatal accidents only. The fatality record improved in 1936, the rate falling from 1.67 in 1935 to 1.59 in 1936; this was followed by a rise to 1.79 in 1937, according to the incomplete reports now available. The higher death rate in 1937 was due largely to an increase in the number of deaths from major disasters (accidents causing 5 or more deaths), as 6 such disasters with a loss of 101 lives were reported in 1937 compared with 4 disasters and 32 lives so lost in 1936. In 1935 only
2 major disasters occurred with a loss of 15 lives. During the 3 years there were 12 major disasters, of which 9 were caused by explosions of gas or coal dust.

COPPER MINES

Employment.—Marked expansion in employment at copper mines in 1936 and again in 1937 was reported by mining companies whose operations represent about 54 percent of the total number of men employed at copper mines in the United States. According to reports covering all mines the number of men working in 1935 totaled 10,188; available reports indicate that final figures will be about 12,600 employees in 1936 and 17,900 in 1937. There were corresponding increases in the number of man-hours worked—from 22.3 million in 1935 to 38.3 million in 1936 and 49.9 million in 1937.

Accidents.—Accidents to men employed at copper mines were more frequent in 1936 and 1937 than in 1935, both in actual number and in proportion to the number of man-hours of exposure to mining risks. The accident rate covering fatal and nonfatal injuries was 66.6 per million man-hours worked in 1935, according to complete reports for that year. This rate increased significantly in 1936 and 1937, preliminary figures indicating that final rates for those years may reach 102 and 142, respectively.

IRON-ORE MINES

Employment.—Large gains in employment were reported by iron-ore mining companies in 1936 and 1937 compared with 1935. Not only did the number of employees increase but also the number of man-days and man-hours worked. From 14,041 employees in 1935, the number increased to 18,592 in 1936, according to complete reports from producers to the Bureau of Mines. The number of employees increased further to approximately 22,500 men in 1937, according to reports from companies representing 80 percent of the entire industry. The volume of labor increased more than 40 percent, reaching 34.7 million man-hours in 1936, and preliminary returns indicate a further increase to 45.6 million man-hours in 1937. Although the standard workday (8 hours) remained unchanged in 1936 and 1937, the number of days worked by the average employee increased from 219 in 1935 to 232 in 1936 and 255 in 1937.

Accidents.—Iron mining has long maintained a safety record that has been definitely better than that for other major classes of metal mining. Although this favorable position was continued in 1936 and 1937, the accident rates for these years were progressively higher than the rate for 1935. Complete reports showed 18.7 accidents per million man-hours of employment in 1935 and 25.9 in 1936; the rate for 1937 is estimated at 30.7 per million man-hours.

LEAD AND ZINC MINES (MISSISSIPPI VALLEY STATES)

Employment.—This group includes lead and zinc mines in the Mississippi Valley States and fluorspar mines in Illinois and Kentucky. There was virtually no change in the total number of men employed in 1936 and 1937 compared with 1935 when 6,728 men were reported. Large gains, however, were made in the number of man-hours worked. These facts were revealed by reports from companies representing 41
percent of the total number of employees in 1935. The number of
man-hours worked by all employees during 1935 was 9.6 million; the
number increased to 12.2 million in 1936 according to complete
reports and to approximately 13.7 million in 1937 according to pre-
liminary returns.

Accidents.—Notable improvement was made in accident preven-
tion during 1936 and 1937, as is indicated by a decidedly downward
trend in accident-frequency rates. The accident rate during 1935
was 69.8 per million man-hours of work performed at the mines.
This rate was lowered to 57.7 in 1936, and partial returns indicate that
it was further reduced to 42.9 in 1937.

GOLD AND SILVER (LODE MINES)

Employment.—This class of mines covers not only gold and silver
mines in all States, but also mines whose output included some copper
which was not, however, the metal of chief value. Also included are
the lead and zinc mines in States other than the Mississippi Valley
States. The group employed 37,105 men in 1935. As figures are not
available for 1936 and 1937, the extent of employment during these
years may best be judged by reports covering identical mines that
were in operation during the 3-year period 1935 to 1937. Reports
for identical mines account for 26 percent of all men employed in the
entire group in 1935; they showed an increase of 9 percent in number
of workers in 1936 over 1935 and of 6.7 percent in 1937 over 1936.
The increases indicate that the group employed approximately 40,000
men in 1936 and 43,000 men in 1937. Similar gains were reported in
man-hours of work done at the mines, the total number in 1935 be-
ing 68.3 million and the estimated number in 1936, 73.5 million, and
in 1937, 80.1 million.

Accidents.—Increased employment at this class of mines was ac-
companied by increases in the number of accidents and an upward
trend in accident rates. In 1935 the accident-frequency rate was 85.4
per million man-hours of exposure; available reports for 1936 and 1937
indicate that the rate increased 20 and 21 percent, respectively, over
1935, or to 102 in 1936 and 103 in 1937. Final figures will indicate
more exactly the actual rates for these years.

PLACER MINES

Complete records for 1935 showed that 13,014 men were engaged
in the production of gold by placer-mining methods in 1935. These
men worked 15,302,730 man-hours, an average of 1,176 per man.
Their accident-frequency rate was 42.4 per million man-hours. No
information is available as yet for either 1936 or 1937.

MISCELLANEOUS METAL MINES

This class of mines, although important, is relatively small numer-
ically; it includes mines producing quicksilver, bauxite, molybdenum,
tungsten, or other metals than gold, silver, copper, lead, and zinc.
Such mines employed 2,899 men in 1935. Reports since that year
are available for companies whose operations included 34 percent of
the total number of men employed in 1935. From these reports it
is estimated that employment for the group increased to 3,700 men
in 1936 and to 5,400 men in 1937. Substantial reductions were effect ed in the accident rates. From a frequency of 91.9 accidents per million man-hours worked in 1935, the accident rate appears to have declined to 56.8 in 1936 and to 56.4 in 1937.

NONMETALLIC-MINERAL MINES

Employment.—Mines that produced salt, gypsum, phosphate rock, sulphur, and other nonmetallic minerals except coal, sand, gravel, or clay employed 8,339 men in 1935. Reports from companies that represented 49 percent of all employees in 1935 show that employment increased 14 percent in 1936 and 19 percent in 1937 compared with 1935. These figures indicate that all mines included in the nonmetallic group employed approximately 9,500 men in 1936 and about 9,900 in 1937. The number of man-hours worked at the mines increased even more in proportion than the number of workers. The total number of man-hours worked was 16.2 million in 1935 and, according to available reports, increased to 19.2 million in 1936 and 19.7 million in 1937.

Accidents.—Although employment increased, the accident rate declined from 50.3 accidents per million man-hours in 1935 to 49.3 in 1936 and 44.7 in 1937, according to available information. These rates are much lower than those for metal mines, except iron-ore mines, whose rates have been especially favorable for many years.

CEMENT QUARRIES

Employment.—Cement mills and quarries operated by companies engaged in producing stone for the manufacture of cement employed 26,004 men in 1936, according to complete returns from the operating companies, an increase of more than 6 percent over the number employed in 1935. Reports from operators who employed 81 percent of the total number of workers in 1936 indicate an increase to approximately 27,300 men in 1937, a gain of nearly 5 percent over 1936. The amount of work performed likewise increased from a total of 39.2 million man-hours in 1935 to 51.8 million in 1936 and about 56.6 million in 1937.

Accidents.—The long-standing favorable safety record of the cement industry was maintained in 1936 and 1937, as the accident rates for cement mills and quarries continued to be much lower than corresponding rates for other branches of quarrying. The rates, however, were not as low in either year as in 1935. Accident frequency was 9.5 per million man-hours of employment in 1935; it increased to 14.5 in 1936, according to complete reports covering all companies, and was lowered to 11.2 in 1937, according to preliminary returns.

LIME QUARRIES

Employment.—This group includes all limestone quarries whose output was used chiefly for the manufacture of lime. The quarries and their associated limekilns employed 8,191 men in 1935 and 9,385 in 1936; preliminary reports for 1937 indicate an increase to 10,100 in 1937. Gains were also made in the total number of man-hours worked by the industry in 1936 and 1937, the number having increased
from 16.6 million man-hours in 1935 to 20.7 million in 1936 and an estimated 21.8 in 1937.

Accidents.—The accident-frequency rates for lime plants were higher in both 1936 and 1937 than in 1935. The rate for 1935 was 52.5 per million man-hours of employment or exposure to risk. Complete reports for 1936 showed an increase in the rate to 54.7, and preliminary reports for 1937 a further increase to 57.4. Much lower rates were reported by a group of lime-producing companies enrolled in a special safety competition conducted by the Bureau of Mines in cooperation with the National Lime Association. The accident-frequency rate for these companies was only 21.1 per million man-hours in 1936 and 22.5 in 1937 compared with rates more than twice as high for the lime industry as a whole. The rate for the enrolled companies was 28.7 in the second half of 1935; the safety contest among lime producers was not begun until July 1, 1935. These rates indicate that the lime industry as a whole may hope to lower its accident rates to levels much below those now prevailing.

LIMESTONE QUARRIES

Employment.—This group includes all limestone quarries except those whose output was used chiefly for the manufacture of cement or lime. The number of employees at limestone quarries, crushing plants, and finishing plants was 22,782 in 1935, increased to 24,288 in 1936, and rose to an estimated 27,200 in 1937; the estimate is based upon reports covering 31 percent of the industry in 1936. The gain in number of employees was accompanied by an increase in the total amount of work done, as the number of man-hours of work rose from 28.6 million in 1935 to 38.4 million in 1936 and an estimated 42.8 million in 1937.

Accidents.—The accident rate for limestone quarries in 1936 (55.0) changed little from that reported for 1935 (54.7 per million man-hours of exposure). However, there was a gratifying reduction in 1937 to 50.7.

MARBLE QUARRIES

Employment.—A large increase in the number of men employed was reported by marble-quarrying companies in 1936 over 1935 and a further but smaller gain in 1937. This statement is based upon complete reports for the first 2 years and reports for 1937 from companies that employed 88 percent of the workers in 1936. Employment totaled 2,441 men in 1935 and increased to 3,304 men in 1936, and preliminary reports indicate a further increase to 3,580 men in 1937. Gains were also made in the amount of work done, which totaled 6.7 million man-hours in 1936 (a gain of 2.7 million over 1935) and which, according to figures now available, increased to 6.8 million in 1937.

Accidents.—The safety record for marble quarries was better in 1936 than in 1935, but the improvement appears to have been more than offset by an increase in the rate for 1937. The rate was 44.1 injuries per million man-hours worked in 1935 and declined to 37.6 in 1936. Preliminary returns covering identical establishments that were active during the 3-year period indicate that the rate for the entire industry was approximately 49.0 per million man-hours of employment in 1937.
SANDSTONE QUARRIES

Employment.—Increased employment was reported by companies producing sandstone in 1936. The number of employees increased further in 1937, although the number of man-hours worked was about the same as in 1936. Pennsylvania and Ohio employed the largest number of men. Employment in all States totaled 3,122 men in 1936, 383 more than in 1935, and reports from companies representing 55 percent of the 1936 industry indicated that the number of employees in 1937 was approximately 3,300. Employees worked 5.2 million man-hours in 1936, an increase of 40 percent over 1935, and it is estimated from preliminary returns that the men worked 5.1 million man-hours in 1937.

Accidents.—After an improvement in the safety record, as indicated by a reduction in the accident rate from 65.9 per million man-hours of exposure in 1935 to 48.2 in 1936, the rate for sandstone quarries increased in 1937 and, according to preliminary returns, reached 86.3. Although this high rate represents the experience of companies whose employees comprise 55 percent of the entire industry, it is possible that the figure may be lowered somewhat by reports from the remaining companies. It is impracticable, as yet, to determine the class of accidents that caused the increase in the rate or to show the States in which the rate increased.

GRANITE QUARRIES

Employment.—Employment in the granite-quarrying industry gained substantially in 1936 and 1937 compared with 1935. An increase of 12 percent brought the number of employees from 6,877 men in 1935 to 8,243 in 1936, and this number, according to preliminary reports, was increased further to approximately 9,300 in 1937. Nearly 58 percent of the men worked in the quarry pits, and more than 42 percent were employed on rock-dressing or other work outside. The number of man-hours of labor performed at the plants also increased notably in 1936 and made a further slight gain in 1937. Complete reports for 1936 showed 14.7 million man-hours worked, an increase of more than 39 percent over 1935. According to partial reports now available, the number of man-hours of work in 1937 was slightly more than 14.7 million.

Accidents.—A reduction in the accident rate was reported in 1936 compared with 1935, but this progress was not continued in 1937, when the rate was higher than that in either 1935 or 1936. Complete reports from all operations showed an accident-frequency rate of 54.6 per million man-hours worked in 1935. This rate was lowered to 52.2 in 1936, but reports from companies representing 48 percent of all employees indicated that it rose to 54.8 in 1937.

SLATE QUARRIES

Employment.—Slate quarries and finishing plants employed 2,565 men in 1936, an increase of 502 over 1935. Preliminary reports indicate that 2,800 men worked in 1937, thus revealing further gains in employment. The total number of man-hours worked also increased substantially; the figure for 1936 was 4.9 million compared with 3.1
million in 1935. According to partial returns the number of hours worked increased to 5.2 million in 1937.

Accidents.—The safety record of the slate industry did not change materially from 1935 through 1937, although accident rates were slightly lower in 1936 and 1937 than in 1935. The rate was 54.9 per million man-hours of exposure in 1935, declined slightly to 53.2 in 1936, and increased a little to 54.2 in 1937 according to reports thus far received.

TRAP-ROCK QUARRIES

Employment.—Although the number of men employed at trap-rock quarries in 1936 and 1937 was about 10 percent less than in 1935, this reduction did not imply a decrease in the amount of work performed. Reports from the producing companies showed a gain of 13 percent in the total number of man-hours worked by the industry in 1936, and preliminary reports indicate a gain of 7 percent in 1937 compared with 1935. Thus the volume of work in 1937 was slightly less than in 1936 but materially more than in 1935. The total number of man-hours worked, as reported by all operators, was 4.8 million in 1936 and, according to reports from companies that represented 36 percent of the total employment in 1936, 4.5 million in 1937.

Accidents.—The safety record was unfavorable in 1936 and 1937, as the accident rate increased in both years over that reported for 1935. Complete reports for 1936 showed that the rate was 60.3 injuries per million man-hours of work performed. According to preliminary returns, the rate increased to 72.0 in 1937; both rates were higher than that of 53.6 for 1935. In 1936 accidents were relatively more frequent at trap-rock quarries than at any other major quarry group. In 1937 the rate for this group was second from the highest, the highest rate being that for sandstone quarries.

SOURCES OF INFORMATION

The statistical record of accidents at mines and quarries in the United States was begun in 1911. Figures for that year were collected and published by the Bureau of Mines, United States Department of the Interior. Prior to 1911 many coal-mining States had published data covering fatal accidents at coal mines, and several metal-mining States had published data covering fatal accidents at certain classes of metal mines, but virtually no similar information was available for the quarrying industry. Some of the State reports also contained figures covering “serious” nonfatal injuries to the mine workers, but the term “serious” was usually not defined. The figures published by the States were generally not comparable because of differences in the classes of mines covered or differences in the periods of time to which the figures related; some States had fiscal years terminating on various dates, and others had fiscal years coinciding with the calendar year.

By direct mail contact with operating companies, the Bureau of Mines obtained reports of both fatal and nonfatal accidents at all commercially operated mines and quarries in 1911. Except for coal mines, the annual canvasses of the mines and quarries has been uninterrupted since 1911. Coal mines were not canvassed after 1911 until 1930, when the yearly canvasses were resumed. From 1912 to 1929,
inclusive, the Bureau’s annual statistics for coal mines covered fatal accidents only, for which figures were furnished monthly to the Bureau by the State mine inspectors in the various coal-producing States. Hence no data are available for nonfatal injuries in coal mining for these years except that contained in the reports of the mining departments of some States. As previously indicated, the State figures cannot be combined to obtain totals for larger areas because of differences in methods of collection or in classes of mines covered by the State laws. Beginning with 1930, all operators of quarries and mines, including coal mines, have furnished to the Bureau of Mines yearly reports covering fatal and nonfatal accidents to their employees. When reporting the number and causes of nonfatal injuries, each operator is asked to include all injuries that disabled an employee for more than the remainder of the day on which the accident occurred. This class of injuries is termed “disabling” or “lost-time” injuries.

The figures thus collected and compiled are incorporated in yearly publications of the Bureau of Mines, copies of which may be purchased at nominal prices from the Superintendent of Documents, Government Printing Office, Washington, D. C.

Statistics of accidents and employment are published by the Bureau of Mines in three annual reports, as follows: “Accidents at Coal Mines in the United States”; “Accidents at Metal Mines in the United States” (this report also covers nonmetal mines); and “Accidents at Quarries in the United States.” In addition to the reports for mines and quarries, the Bureau also publishes annually a report on “Accidents at Metallurgical Works in the United States” and one on “Accidents at Coke Ovens in the United States.”