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Volume Author/Editor: Harold Barger and Sam H. Schurr

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Chapter Author: Harold Barger, Sam H. Schurr

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Appendix A

Basic Data and Indexes for Individual Industries

THE first four tables in this appendix bring together information on output (in physical and value terms) and employment in every mining industry for which we were able to assemble data of either kind. Tables A-5 and A-6 summarize this material, and show comparable indexes of output, employment and productivity. In Table A-7 will be found additional output indexes which are in general more comprehensive than the available employment data. Sources of data are indicated in detail in notes to the tables. It remains for us to point out some characteristics of the data and to describe the construction of the index numbers.[1]

Definition of Mining

Mining has to be defined in order that we may know at what stage output is to be measured and what sorts of employment are to be included. The definition must perforce run in terms of processes or branches of activity, in which a certain labor input is consumed and a certain output of product results. According to many authorities, the mineral industries should be considered to include not only ore digging and hoisting proper but also the associated processes of milling, smelting and refining.[2] Trade usage frequently regards burning, calcining, smelting or refining as part of the mineral industry; even the manufacture of cement, lime, coke or steel may sometimes be included. The definition used in this study is considerably more restricted and is based upon the distinction that the Bureau of the Census now draws in presenting statistics for the mineral industries. The data for smelting and refining are included in the Census of Manufactures, and therefore excluded from this study, whereas statistics relating to all processes preliminary to smelting are presented in the Census of Mines and Quarries. "Mining" thus includes also the associated processes of ore dressing and concentration, which are necessary in the preparation

[1] All data are intended to relate to the continental United States; care has been taken to exclude Alaska from the statistics.

[2] See, for example, F. G. Tryon and F. E. Berquist, "Mineral Economics—An Outline of the Field" in *Mineral Economics,* ed. by F. G. Tryon and E. C. Eckel (McGraw-Hill, 1932), p. 3.

of the ore for the smelter. Again, the Census Bureau regards cement making as a form of manufacturing, but stone crushing as a part of the quarrying process. On page 4 of the introduction to the 1929 Census of Mines and Quarries (henceforth all references to the Census will refer to Mines and Quarries unless otherwise specified) the following explanation appears:

> Much of the products of mines must be beneficiated, improved in grade, or otherwise treated at or near the mine before the material is suitable for smelting, manufacturing, or other purposes. Among the processes employed are crushing, grinding, washing, drying, air separation, flotation . . . etc. Although such milling processes are in the nature of manufacturing, they are commonly considered as belonging to the mining industries, and when they are performed at or near the mines by mining enterprises, or by enterprises operating on a custom basis, the data pertaining to them are included in the statistics for the several mining industries. On the other hand, certain other processes by which the mined product is materially changed in nature or otherwise adapted to use, and which ordinarily represent the major activities of the enterprises, are considered as manufacturing, and data for these are not included in the statistics for mines and quarries. Such processes include the smelting and refining of metals. . . .

In one sense we are forced to accept the Census definition of mining if it is our intention to use Census data in the course of our work. Moreover, it would seem that an argument based on more than mere necessity can be advanced for drawing the same boundaries as those set by the Census. For the processes of breaking, washing, concentrating, milling or otherwise beneficiating the mineral product—all of which, following the Census, we regard as mining operations—for the most part were formerly carried on, insofar as they were performed at all, by the miner himself.[3] The fact that specialization of function has transferred a portion of the miner's task to separate personnel and equipment at the surface is not in itself a reason for defining mining operations today in a less comprehensive fashion than was formerly necessary. The most important function to become specialized in this manner, the milling of metallic ores, is in essence a process whereby ores of different minerals, and different minerals from the same ore, are separated from waste matter and sorted. Unlike the pyrometal-

[3] "Milling is only a better and cheaper way of doing things that were at first accomplished otherwise. It probably originated as a partial substitute for the sorting of ore by hand and this must have long remained its chief function." C. E. Julihn, "Copper: An Example of Advancing Technology and the Utilization of Low-Grade Ores" in *Mineral Economics,* cited above.

lurgical and other chemical processes characteristic of smelting and refining, milling involves physical rather than chemical separation of materials. In this sense it is only slightly removed from the actual process of severing the ore from the earth. Milling, and other accessory functions carried on in close proximity to the mine, are therefore considered a form of mining activity. Such functions include the washing and grading of coal and the crushing of stone. On the other hand, the smelting and refining of metals, the coking of coal, the refining of crude oil, the production of cement, the calcining of gypsum and the cutting of dimension stone are considered manufacturing processes and fall outside the purview of the statistics in this appendix.

The output series provided in Table A-1 relate as far as possible to the product emerging from the last stage of the mining process as so defined, whether this product is for shipment or merely an addition to inventory. In the case of gold, silver, copper, lead, zinc and mercury, output is measured in recovered or recoverable metal content. Elsewhere the quantity data refer to amounts of actual mineral, sometimes (as with iron ore) broken down by grade. In Table A-1, the price data for gold, silver, copper, lead and zinc refer to market prices of these metals, since annual series for mine value are unobtainable. In other cases, except where noted, data in Table A-1 relate to mine value, i.e., the value of the mineral per unit at the time it leaves the mining process as we have defined that process. The same observation applies also to all data in Table A-2. Finally, the figures for employment in Tables A-3 and A-4 are intended to cover all work up to, but not beyond, the point where the product leaves the mining process.

Method of Construction of the Output Indexes

As in previous reports in this series, the standard basis of comparison adopted was that usually known as the Edgeworth formula:

$$\frac{\Sigma q_1 (p_0 + p_1)}{\Sigma q_0 (p_0 + p_1)}$$

where the q's refer to quantities, the p's to prices, and the suffixes identify the years to be compared. This is equivalent to the ratio of the values of the outputs in the two years, these values being computed in constant prices; for each commodity the price chosen is its mean for the two years considered. The formula has the advantage that the weighting system is revised for each new comparison, and when computed for successive pairs of years, additional commodities can be included as data become available. The index takes the form of a chain of such comparisons. However, it may readily be shown that a series

of successive year-to-year comparisons between, say, 1899 and 1939, may offer a result which differs significantly from that obtained in a single direct comparison between the years in question.

At different points in this study we have been interested both in year-to-year changes and in long term trends. Some form of compromise had therefore to be adopted. Thus the construction of every index of output which rested on more than one series involved the following steps. First, comparisons were made between 1899 and 1909, 1909 and 1919, 1919 and 1929, and 1929 and 1937.[4] Second, a chain index was computed for the entire period 1899 to 1939, and this annual series was then fitted into the framework provided by the four comparisons just mentioned. That is, for the years 1899–1909 we adjusted the chain index by distributing the discrepancy between it and the direct comparison 1899–1909 in an even fashion over the decade in question. For 1938 and 1939 the chain comparisons were left undisturbed. In this way the comparison between 1899 and 1937 as reported by the index involves four links only; that between 1899 and 1939 involves six links. The comparison between, say, 1909 and 1921 is made in three links, two of which (1919–20 and 1920–21) involve a small adjustment of the type mentioned.

The output indexes will be found assembled in Tables A-5, A-6 and A-7. The indexes in Tables A-5 and A-6 have an industrial or a product coverage which makes them suitable for comparison with employment. In Table A-7 indexes of output are shown for industries or products for which we do not have comparable employment data. The index for total mining in this table is therefore more comprehensive than the corresponding index, bearing the same title, in Table A-5.

Character of the Employment Data

The figures for oil and gas wells in Table A-3 cover wage earners only. For other industries for which employment data are given in Tables A-3 and A-4, the figures include also those salaried employees who work in and about the mine and who are subject to accident risks. (No segregation between wage earners and these others can be carried out except for Census years.) In this respect the employment figures we have been able to assemble for the mining industries on an annual basis differ (except in the case of oil and gas wells) from corresponding series available for manufacturing and other segments of the economy,

[4] Except for 1899 and 1937 these are Census years. The year 1899 was chosen (instead of 1902) since it was the initial year covered in the study; and 1937 was selected (instead of 1939) because many calculations had to be made before data for the latter year were available.

in which the material usually relates either to wage earners or to total employment.

The employment data in Tables A-3 and A-4 are presented under the rubrics of men, mandays and manhours. The derivation of these estimates, which rest partly on Census data and partly on canvasses by the Bureau of Mines, is described in considerable detail in footnotes to the tables. The figures for manhours are obtained, in almost every case, by multiplying mandays by nominal hours per day: sometimes this multiplication was performed by the Bureau of Mines, sometimes by ourselves. In similar fashion, the figures for mandays are rarely the result of direct enumeration: in most instances they are derived, mainly by the Bureau of Mines itself, from figures for the number of persons employed. To a first degree of approximation, the figures in Tables A-3 and A-4 for men employed may be described as active period averages (as in the last column of Table 7, Chapter 3), i.e., averages reckoned in the case of each establishment over the active period of the year only. To derive manday totals these average employment figures are multiplied by the number of days during the year that the mine, or the average number of days that the industry, was active. Because of the importance of the matter, which in a quantitative sense overshadows many lesser ambiguities to be found in commonly published measures of employment, something further must be said about methods of constructing annual averages.

Undoubtedly the least ambiguous average from a statistical standpoint would be one based on daily counts. Thus, to derive the average number of men employed during a year, 365 daily counts would be summed, and the sum divided by 365. (If the establishment normally closed completely on Sundays and holidays, 300 counts might be summed, and the result divided by 300.) The sum itself is of course the number of mandays for the establishment reporting. In other words, the ideal method of averaging employment requires that the actual number of mandays worked be known.

Except occasionally in recent years, mines have not ordinarily reported their mandays of employment. Rather they report 12 monthly employment figures. To derive average employment for the year from such information, two alternative plans are possible: either the 12 monthly figures may be summed and divided by 12 (even if employment in some months is zero), or else figures for the active months only may be summed and divided by the number of such months. The Bureau of the Census uses the former, the Bureau of Mines the latter, method: the first is commonly called a full year, the second an active period average. If there are no inactive months, the two averages will agree—provided both are based upon the same set of monthly figures.

But if some mines have inactive months, average employment reported by the Bureau of Mines will run higher than average employment reported in the Census. It is important to notice that, whichever method is used, the precise character of the annual average obtained depends upon the manner in which the monthly figures themselves are derived.

If the monthly figures were themselves averages of daily counts, the Census procedure would yield a true full year average. The plan adopted by the Bureau of Mines, on the other hand, would yield neither a true full year average nor (except by accident) a true active period average, but something we may best call a hybrid. For the monthly data would themselves be full period averages, even though only active months are averaged in computing an annual figure. The Bureau of Mines average would be a true active period average only if periods of inactivity happened to coincide with calendar months. If, on the contrary, the monthly figures were active period averages, derived by summing numbers employed on active days and dividing by their number, the plan followed by the Bureau of Mines would yield a true active period average, and the Census procedure a hybrid. For the latter method averages twelve sets of monthly data, each set being an average for the active days in the month only. The Census would report a true full year average only if there were no inactive periods.

In fact the monthly counts upon which both the Census and the Bureau of Mines rely are payroll figures which relate to a representative day or week in each month. Consequently both methods in practice yield hybrid results. The best we can say is that the figure published by the Bureau of Mines is an approximation to an active period average, that reported by the Census an approximation to a full year average. This means that estimates of mandays derived from these averages are likewise only approximations. We are especially interested in the accuracy of the manday totals which the Bureau of Mines reports, for we make extensive use of these data in Tables A-3 through A-6. For the most part they are derived by multiplying active period averages (of the kind discussed) by the number of days during the year that the establishment is reported as active. Since a representative payroll count is likely to be larger than a true active period average for the corresponding month, the manday totals so obtained probably overstate mandays of employment in the various mining industries.[5]

Despite this weakness we have chosen to treat mandays as our basic

[5] If the Bureau of Mines were to use active period averages, instead of representative counts, for individual months, such a procedure would probably understate mandays of employment. The reason is that inactivity is rarely complete, and mandays worked during inactive periods by men engaged in maintenance and development work would be neglected.

measure of employment. They are clearly superior to the active period averages for men employed, for unlike the averages the manday totals pay attention to the number of days worked. The manhour figures are even further removed from the crude data than the manday figures, and involve still other assumptions (e.g., correspondence between nominal and actual hours worked). Where we had to make adjustments to the data, as described in the notes to Tables A-3 and A-4, these were performed in terms of mandays, and corresponding changes were made where necessary in the figures for men and for manhours. Where the active period averages for men employed were readily available or easily derived, we have inserted these in the tables, but have made no further use of them. Manhour figures are shown for those years for which they could be estimated.

The Indexes of Employment and Productivity

In constructing indexes of employment (Tables A-5 and A-6) we have made no attempt to differentiate between grades of labor, or to make allowance for variations in the skill or intensity of labor in different industries or occupations. In our calculations any manday or manhour is treated as the equivalent of any other manday or manhour. Consequently the indexes of employment offered here constitute simple comparisons between manday or manhour aggregates for different years. The indexes of output per manday or per manhour were obtained by dividing the indexes of mandays or manhours into the corresponding output indexes.

The reliability of the productivity indexes hinges upon the comparability of the indexes of output and employment. Some remarks on this question will be found in the notes appended to Tables A-5 and A-6. Further information for judging the comparability of the two sets of data is presented in the footnotes to Table A-1 (output) and to Tables A-3 and A-4 (employment) respectively. Our productivity measures are probably least reliable for oil and gas wells and for stone quarrying, and most satisfactory in the case of anthracite and bituminous coal. For the metal mining industries, for gypsum and for phosphate rock mining, our measures appear to occupy an intermediate position from the standpoint of accuracy.

Finally, we should mention one obvious weakness of the data. In constructing productivity indexes for manufacturing and many other fields it is both possible and convenient to use Census data for output and for employment as well. This procedure has the great advantage that the numerator and denominator in the productivity quotient come from the same canvass, and may therefore be assumed to have the

same coverage. In mining, because of the infrequency of Census inquiries and because of the wavering line which some early Censuses drew between mining and manufacturing, we cannot base our measures primarily upon the Census. We have therefore to obtain output and employment from different sources. The output figures come from trade reports to the Bureau of Mines checked against the Census by the Bureau, and are substantially complete. The employment figures, on the other hand, come for the most part from a quite separate canvass by the Bureau of Mines made for the purpose of computing accident rates. Their coverage is much less reliable than that of the output data.

Although the resulting productivity measures are less trustworthy than those which can be computed for manufacturing from the Census of Manufactures, it is true also that in another respect our data for mining are superior to those for manufacturing. Many manufactured products are not susceptible of physical measurement, and comprehensive indexes of manufacturing output have consequently to make use of such devices as the coverage adjustment, whereby changes in total value of products are invoked to supplement data available for measurable output.[6] In mining no such difficulty arises, for the products, being crude or unfabricated, can always be subjected to physical measurement.

For many lesser divisions of mining there are no employment statistics except for infrequent Census years. However, in each comparison leading to a productivity index, the industries or products included in the output index have of course been matched with those for which employment data are available. Thus the output indexes in Tables A-5 and A-6 cover only those industries for which figures on employment are given in Tables A-3 and A-4. Output indexes—no longer strictly comparable with those for employment—for other industries and products, and for all products for which we have data, will be found in Table A-7. No data for the physical output of stone quarrying are available prior to 1906, but for subsequent years the coverage of the output index for mining as a whole in Table A-7 is practically complete.[7]

Supplementary Tables

Statistical materials used for illustrative purposes at various points in this report are presented in the remaining tables of Appendix A. In

[6] See Solomon Fabricant, *The Output of Manufacturing Industries, 1899–1937* (National Bureau of Economic Research, 1940), especially pp. 362-72.

[7] For the period since 1919 our basic output index (Tables 1 and A-7; Charts 1 and 2) has a coverage in excess of 99 percent of all minerals for which value data are reported.

Table A-8 will be found figures for the secondary output of nonferrous metals discussed in Chapter 2. Tables A-9 and A-10 offer measures computed from sample data by the National Research Project; these permit comparisons of productivity at underground and open pit mines in the bituminous coal and copper mining industries (Chapters 8 and 12). Tables A-11 through A-15 give figures for the consumption of nonferrous metals, coal and petroleum by use, a topic discussed in Chapter 2. Tables A-16 and A-17 show the derivation of our indexes for the physical volume of construction activity, and their comparison with stone output (Chapter 2). Table A-18 gives the data on petroleum discoveries and reserves discussed in Chapter 10. Table A-19 shows the derivation of employment figures for oil and gas wells in 1939, use of which is made in Chapter 3.

TABLE A-1

PHYSICAL OUTPUT AND MINE VALUE OF INDIVIDUAL MINERALS

A general note appears at the end of this table, followed by specific notes numbered in the same manner as the columns to which they refer.

	(A) TOTAL		(1) IRON ORE (B) HEMATITE		(C) BROWN ORE		(D) MAGNETITE		(E) CARBONATE	
Year	*Quantity* Mil. l.t.	*Price* $ per l.t.	*Quantity* Mil. l.t.	*Price* $ per l.t.	*Quantity* Mil. l.t	*Price* $ per l.t.	*Quantity* Mil. l.t.	*Price* $ per l.t.	*Quantity* Th. l.t.	*Price* $ per l.t.
1899	24.6	1.41	..	..	..	..	..	..	..	..
1900	27.3	2.40	..	..	..	..	..	..	..	..
1901	28.6	1.68	..	..	..	..	..	..	..	..
1902	35.3	1.82	..	..	..	..	..	..	..	..
1903	34.8	1.88	..	..	..	..	..	..	..	..
1904	27.5	1.55	..	..	..	..	..	..	..	..
1905	42.4	1.76	..	..	..	..	..	..	..	..
1906	..	..	42.5	2.13	2.78	1.78	2.47	2.05	18.0	1.75
1907	..	..	46.1	2.03	2.96	1.81	2.68	2.03	23.6	1.74
1908	..	..	31.8	2.32	2.62	1.70	1.55	2.40	26.6	1.38
1909	..	..	46.2	2.17	2.84	1.68	2.23	2.40	16.5	1.73
1910	..	..	51.4	2.52	2.99	1.76	2.63	2.36	22.3	1.61
1911	..	..	39.6	2.12	2.03	1.72	2.20	2.29	15.7	1.83
1912	..	..	51.3	1.87	1.61	1.79	2.18	2.18	10.3	1.96
1913	..	..	57.9	2.21	1.68	1.88	2.36	2.07	7.85	2.06
1914	..	..	38.3	1.79	1.54	1.72	1.61	2.39	5.14	2.44
1915	..	..	52.2	1.80	1.49	1.80	1.81	2.50	3.46	2.44
1916	..	..	70.7	2.32	1.90	2.03	2.53	3.11	1.80	3.00
1917	..	..	70.7	3.12	1.99	2.95	2.55	4.29	0	..
1918	..	..	65.9	3.35	1.61	3.51	2.15	4.60	0	..
1919	..	..	57.7	3.48	1.13	3.63	2.12	4.08	0	..
1920	..	..	63.9	4.09	1.33	4.19	2.39	4.59	3.74	..
1921	..	..	28.3	3.37	.370	2.63	.781	3.61	2.71	..
1922	..	..	44.9	3.14	.784	2.65	1.45	2.37	3.26	..
1923	..	..	65.9	3.46	1.23	2.88	2.19	3.34	3.52	..
1924	..	..	52.1	2.91	.814	2.75	1.35	2.95	3.25	..
1925	..	..	59.5	2.50	.885	2.78	1.47	3.07	4.70	..
1926	..	..	64.6	2.49	.811	2.83	2.18	3.13	2.22	..
1927	..	..	58.5	2.43	.743	2.62	2.49	3.38	2.49	..
1928	..	..	59.2	2.43	.817	2.47	2.17	3.04	1.79	..
1929	..	..	69.8	2.59	.776	2.47	2.40	3.15	1.78	..
1930	..	..	55.3	2.61	.720	2.53	2.42	3.38	1.00	..
1931	..	..	29.7	2.58	.360	2.47	1.11	3.07	.818	..
1932	..	..	9.62	2.41	.0617	2.39	.163	2.87	.477	..
1933	..	..	16.9	2.59	.235	2.08	.397	2.83	.499	..
1934	..	..	23.4	2.57	.286	2.39	.910	2.87	.640	..
1935	..	..	28.9	2.48	.267	2.26	1.35	2.58	.687	..
1936	..	..	46.1	2.53	.475	2.32	2.21	3.20	.533	..
1937	..	..	68.1	2.89	.666	2.40	3.35	2.69	.532	..
1938	..	..	25.6	2.82	.363	2.31	2.48	2.79	.448	..
1939	..	..	47.8	2.89	.597	2.14	3.38	2.99	.463	..

TABLE A-1—INDIVIDUAL MINERALS (continued)

(2) MANGANESE ORE

Year	(A) Over 40 Percent Manganese		(B) Over 35 Percent Manganese		(C) 5 to 40 Percent Manganese		(D) 10 to 35 Percent Manganese		(E) 5 to 10 Percent Manganese	
	Quantity Th. l.t.	*Price* $ per l.t.	*Quantity* Th. l.t.	*Price* $ per l.t.	*Quantity* Th. l.t.	*Price* $ per l.t.	*Quantity* Th. l.t.	*Price* $ per l.t.	*Quantity* Th. l.t.	*Price* $ per l.t.
1899	9.94	8.28	..	..	109	3.23	..	..	..	..
1900	11.8	8.52	..	..	232	4.76	..	..	..	..
1901	12.0	9.73	..	..	291	3.83	..	..	..	..
1902	7.48	8.15	..	..	207	4.63	..	..	..	..
1903	2.82	8.97	..	..	194	3.64	..	..	..	..
1904	3.15	9.37	..	..	123	3.28	..	..	..	..
1905	4.12	8.80	..	..	131	2.96	..	..	..	..
1906	6.92	12.7	..	..	98.3	3.60	..	..	..	..
1907	5.60	11.3	..	..	104	2.50	..	..	..	..
1908	6.14	10.2	..	..	55.9	2.38	..	..	..	..
1909	1.54	12.7	..	..	68.7	3.14	..	..	..	..
1910	2.26	10.1	..	..	61.1	3.06	..	..	..	..
1911	2.46	10.0	..	..	44.4	2.59	..	..	..	..
1912	1.66	9.45	..	..	51.5	.387	..	..	..	..
1913	4.05	10.0	..	..	59.4	.423	..	..	..	..
1914	2.64	10.4	..	..	98.3	2.22	..	..	..	..
1915	..	..	9.61	11.7	..	..	181	4.40	14.8	1.36
1916	..	..	31.5	20.8	..	..	454	3.94	90.5	2.09
1917	..	..	129.4	31.8	..	..	731	4.16	130	2.84
1918	..	..	305.9	26.9	..	..	916	5.02	254	4.06
1919	..	..	55.3	32.5	..	..	310	3.82	124	2.99
			55.0	32.6	..	..	212	4.56	112	3.14
1920	..	..	94.4	25.4	..	..	357	4.06	280	2.30
1921	..	..	13.5	36.6	..	..	8.44	5.07	62.7	2.36
1922	..	..	13.4	34.0	..	..	345	3.11	252	2.51
1923	..	..	31.5	27.8	..	..	320	3.62	1,072	3.36
1924	..	..	56.5	23.1	..	..	286	3.24	587	2.92
1925	..	..	98.3	18.9	..	..	267	3.42	1,153	2.43
1926	..	..	46.3	26.6	..	..	364	3.24	835	2.32
1927	..	..	44.7	25.8	..	..	148	4.54	1,310	2.50
1928	..	..	46.9	25.9	..	..	90.6	4.50	1,085	2.44
1929	..	..	60.4	26.7	..	..	78.2	5.78	1,110	2.54
1930	..	..	67.0	21.4	..	..	77.4	7.31	708	2.59
1931	..	..	39.2	17.8	..	..	64.1	6.33	217	2.63
1932	..	..	17.8	21.2	..	..	15.6	4.00	9.80	3.01
1933	..	..	19.2	24.4	..	..	12.8	4.52	179	2.64
1934	..	..	26.5	21.6	..	..	23.2	4.66	199	2.58
1935	..	..	26.4	21.1	..	..	93.3	3.50	431	2.31
1936	..	..	32.1	21.7	..	..	99.0	3.40	842	2.26
1937	..	..	40.2	26.4	..	..	152	5.13	1,189	2.59
1938	..	..	25.3	26.9	..	..	33.6	4.69	275	2.55
1939	..	..	29.3	27.1	..	..	240	3.90	470	2.58

TABLE A-1—INDIVIDUAL MINERALS (continued)

Year	(3) COPPER, 1904–39						(4) LODE GOLD AND SILVER, AND LEAD AND ZINC OUTSIDE MISSISSIPPI VALLEY, 1906–39			
	(A) COPPER		(B) GOLD		(C) SILVER		(A) GOLD		(B) SILVER	
	Quantity Th. s.t.	*Price* $ per s.t.	*Quantity* Th. f.oz.	*Price* $ per f.oz.	*Quantity* Mil. f.oz.	*Price* $ per f.oz.	*Quantity* Mil. f.oz.	*Price* $ per f.oz.	*Quantity* Mil. f.oz.	*Price* $ per f.oz.
1899	..	..	..	..	..	..	..	..	..	..
1900	..	..	..	..	..	..	..	..	..	..
1901	..	..	..	..	..	..	..	..	..	..
1902	..	..	..	..	..	..	..	..	..	..
1903	..	..	..	..	..	..	..	..	..	..
1904	405	256	237	20.67	15.8	.58	..	..	..	..
1905	442	312	252	20.67	15.7	.61	..	..	..	..
1906	456	386	267	20.67	15.9	.68	2.94	20.67	41.3	.68
1907	420	400	268	20.67	13.9	.66	2.63	20.67	38.4	.66
1908	476	264	231	20.67	14.9	.53	2.80	20.67	35.7	.53
1909	561	260	270	20.67	18.3	.52	3.02	20.67	38.8	.52
1910	542	254	263	20.67	16.0	.54	3.03	20.67	41.4	.54
1911	544	250	259	20.67	16.4	.53	3.08	20.67	44.1	.53
1912	610	330	255	20.67	18.4	.615	2.85	20.67	47.1	.615
1913	607	310	269	20.67	18.0	.604	2.73	20.67	52.8	.604
1914	563	266	257	20.67	14.5	.553	2.80	20.67	54.6	.553
1915	701	350	336	20.67	17.9	.507	3.04	20.67	53.3	.507
1916	943	492	392	20.67	23.3	.658	2.62	20.67	54.1	.658
1917	903	546	328	20.67	19.3	.824	2.31	20.67	50.1	.824
1918	920	494	304	20.67	19.7	.98	1.98	20.67	47.4	.98
1919	583	372	184	20.67	12.4	1.12	1.65	20.67	38.8	1.12
1920	577	368	170	20.67	11.5	1.09	1.39	20.67	44.1	1.09
1921	205	258	51.4	20.67	4.24	1.00	1.43	20.67	41.3	1.00
1922	443	270	130	20.67	9.75	1.00	1.48	20.67	50.7	1.00
1923	696	294	270	20.67	14.0	.82	1.47	20.67	55.5	.82
1924	766	262	310	20.67	15.8	.67	1.55	20.67	47.6	.67
1925	802	284	346	20.67	17.5	.694	1.37	20.67	48.5	.694
1926	829	280	364	20.67	16.4	.624	1.27	20.67	45.3	.624
1927	797	262	368	20.67	14.0	.567	1.15	20.67	44.9	.567
1928	884	288	415	20.67	14.4	.585	1.15	20.67	43.0	.585
1929	977	352	458	20.67	17.6	.533	1.02	20.67	42.8	.533
1930	689	260	333	20.67	13.3	.385	1.19	20.67	34.0	.385
1931	518	182	215	20.67	9.38	.290	1.33	20.67	20.1	.290
1932	234	126	98.9	20.67	5.10	.282	1.46	20.67	17.4	.282
1933	191	128	106	25.56	5.84	.350	1.40	25.56	17.1	.350
1934	237	160	146	34.95	7.75	.646	1.71	34.95	24.8	.646
1935	373	166	227	35.00	12.5	.719	2.06	35.00	35.6	.719
1936	596	184	379	35.00	17.1	.774	2.30	35.00	43.5	.774
1937	825	242	496	35.00	20.1	.774	2.37	35.00	50.7	.774
1938	543	196	341	35.00	15.6	.646	2.50	35.00	45.5	.646
1939	728	208	471	35.00	18.4	.679	2.66	35.00	45.7	.679

TABLE A-1—INDIVIDUAL MINERALS (continued)

Year	(4) LODE GOLD AND SILVER, AND LEAD AND ZINC OUTSIDE MISSISSIPPI VALLEY, 1906–39 (continued)				(5) LEAD AND ZINC (MISSISSIPPI VALLEY), 1906–39					
	(C) LEAD		(D) ZINC		(A) LEAD		(B) ZINC		(C) FLUORSPAR, ILL. AND KY.	
	Quantity Th. s.t.	*Price* $ per s.t.	*Quantity* Th. s.t.	*Price* $ per s.t.	*Quantity* Th. s.t.	*Price* $ per s.t.	*Quantity* Th. s.t.	*Price* $ per s.t.	*Quantity* Th. s.t.	*Price* $ per s.t.
1899	..	..	..	..	..	..	..	..	..	..
1900	..	..	..	..	..	..	..	..	..	..
1901	..	..	..	..	..	..	..	..	..	..
1902	..	..	..	..	..	..	..	..	..	..
1903	..	..	..	..	..	..	..	..	..	..
1904	..	..	..	..	..	..	..	..	..	..
1905	..	..	..	..	..	..	..	..	..	..
1906	220	114	104	122	128	114	131	122	..	..
1907	222	106	96.9	118	143	106	156	118	..	..
1908	180	84	86.7	94	150	84	147	94	..	..
1909	220	86	126	108	165	86	176	108	49.7	5.75
1910	215	88	145	108	168	88	180	108	64.3	6.26
1911	242	90	158	114	185	90	174	114	81.2	7.12
1912	259	90	192	138	183	90	193	138	114	6.61
1913	299	88	228	112	184	88	185	112	105	6.30
1914	305	78	237	102	200	78	178	102	92.9	5.98
1915	324	94	356	248	218	94	232	248	136	5.56
1916	354	138	411	268	246	138	292	268	146	5.95
1917	361	172	375	204	267	172	339	204	200	10.3
1918	301	142	312	182	261	142	324	182	220	22.5
1919	197	106	220	146	232	106	329	146	125	26.5
1920	247	160	231	162	249	160	357	162	166	26.1
1921	172	90	71.7	100	242	90	185	100	27.7	22.0
1922	210	110	160	114	267	110	312	114	136	18.1
1923	289	140	218	136	258	140	392	136	110	21.6
1924	312	160	219	130	284	160	419	130	110	20.7
1925	366	174	254	152	318	174	457	152	99.3	18.7
1926	375	160	306	150	308	160	468	150	116	18.8
1927	384	126	339	128	280	126	380	128	104	18.4
1928	366	116	358	122	267	116	337	122	136	19.0
1929	379	126	{372 / 395}	132	274	126	{352 / 330}	132	138	19.4
1930	319	100	362	96	238	100	234	96	83.3	19.2
1931	221	74	280	76	182	74	130	76	51.5	17.6
1932	156	60	187	60	135	60	98.3	60	24.3	15.7
1933	161	74	239	84	110	74	145	84	70.7	14.3
1934	172	74	276	86	114	74	163	86	76.4	16.5
1935	198	80	318	88	133	80	200	88	113	15.1
1936	223	92	340	100	149	92	235	100	162	18.1
1937	259	118	382	130	205	118	244	130	166	20.7
1938	210	92	318	96	159	92	199	96	70.2	20.4
1939	215	94	352	104	198	94	232	104	165	20.7

TABLE A-1—INDIVIDUAL MINERALS (continued)

Year	(6) PLACER GOLD AND SILVER				(7) LODE GOLD AND SILVER, AND COPPER, LEAD AND ZINC, 1899–1906					
	(A) GOLD		(B) SILVER		(A) GOLD		(B) SILVER		(C) COPPER	
	Quantity Th. f.oz.	*Price* $ per f.oz.	*Quantity* Th. f.oz.	*Price* $ per f.oz.	*Quantity* Mil. f.oz.	*Price* $ per f.oz.	*Quantity* Mil. f.oz.	*Price* $ per f.oz.	*Quantity* Th. s.t.	*Price* $ per s.t.
1899	300	20.67	0	..	2.94	20.67	56.5	.60	284	342
1900	304	20.67	0	..	3.17	20.67	60.1	.62	303	332
1901	370	20.67	0	..	3.15	20.67	57.8	.60	301	334
1902	321	20.67	0	..	3.19	20.67	57.7	.53	330	244
1903	303	20.67	0	..	2.93	20.67	56.2	.54	348	274
1904	322	20.67	10.9	.58	3.15	20.67	55.8	.58	405	256
1905	348	20.67	37.7	.61	3.16	20.67	56.1	.61	442	312
1906	428	20.67	56.4	.68	3.21	20.67	57.1	.68	455	386
1907	395	20.67	51.3	.66	..	..	..	..	..	..
1908	471	20.67	89.2	.53	..	..	..	..	..	..
1909	522	20.67	58.0	.52	..	..	..	..	..	..
1910	509	20.67	58.0	.54	..	..	..	..	..	..
1911	526	20.67	59.8	.53	..	..	..	..	..	..
1912	534	20.67	61.1	.615	..	..	..	..	..	..
1913	559	20.67	65.3	.604	..	..	..	..	..	..
1914	599	20.67	68.9	.553	..	..	..	..	..	..
1915	570	20.67	72.4	.507	..	..	..	..	..	..
1916	568	20.67	64.4	.658	..	..	..	..	..	..
1917	552	20.67	54.2	.824	..	..	..	..	..	..
1918	473	20.67	51.2	.98	..	..	..	..	..	..
1919	464	20.67	45.4	1.12	..	..	..	..	..	..
1920	416	20.67	48.2	1.09	..	..	..	..	..	..
1921	473	20.67	58.8	1.00	..	..	..	..	..	..
1922	325	20.67	34.4	1.00	..	..	..	..	..	..
1923	377	20.67	35.4	.82	..	..	..	..	..	..
1924	278	20.67	29.0	.67	..	..	..	..	..	..
1925	280	20.67	26.2	.694	..	..	..	..	..	..
1926	275	20.67	25.0	.624	..	..	..	..	..	..
1927	307	20.67	26.5	.567	..	..	..	..	..	..
1928	255	20.67	22.3	.585	..	..	..	..	..	..
1929	209	20.67	18.3	.533	..	..	..	..	..	..
1930	206	20.67	18.3	.385	..	..	..	..	..	..
1931	219	20.67	18.2	.290	..	..	..	..	..	..
1932	277	20.67	26.2	.282	..	..	..	..	..	..
1933	331	25.56	35.7	.350	..	..	..	..	..	..
1934	386	34.95	45.4	.646	..	..	..	..	..	..
1935	478	35.00	52.0	.719	..	..	..	..	..	..
1936	558	35.00	62.2	.774	..	..	..	..	..	..
1937	619	35.00	70.5	.774	..	..	..	..	..	..
1938	759	35.00	89.6	.646	..	..	..	..	..	..
1939	867	35.00	109	.679	..	..	..	..	..	..

TABLE A-1—INDIVIDUAL MINERALS (continued)

Year	(7) LODE GOLD AND SILVER, AND COPPER, LEAD AND ZINC, 1899–1906 (continued) (D) LEAD		(E) ZINC		(8) BAUXITE		(9) MERCURY	
	Quantity Th. s.t.	*Price* $ per s.t.	*Quantity* Th. s.t.	*Price* $ per s.t.	*Quantity* Th. l.t.	*Price* $ per l.t.	*Quantity* Th. flasks	*Price* $ per flask
1899	202	90	129	116	32.9	3.56	30.7	47.4
1900	261	88	124	88	23.4	3.87	28.5	44.6
1901	259	86	141	82	19.9	4.23	29.9	48.1
1902	267	82	157	96	27.3	4.41	34.5	42.9
1903	281	84	159	108	44.7	3.56	35.9	45.0
1904	298	86	187	102	51.0	4.95	35.2	43.6
1905	308	94	204	118	56.6	4.99	30.1	36.7
1906	336	114	200	122	70.6	4.89	25.7	40.0
1907	..	..	..	..	94.4	4.91	21.3	40.1
1908	..	..	..	..	50.1	5.06	19.5	44.8
1909	..	..	..	..	132	5.26	20.8	46.1
1910	..	..	..	..	151	4.81	20.3	47.1
1911	..	..	..	..	157	4.82	21.0	46.6
1912	..	..	..	..	161	4.81	24.7	42.6
1913	..	..	..	..	211	4.75	19.9	40.8
1914	..	..	..	..	219	4.88	16.3	49.7
1915	..	..	..	..	300	5.10	20.8	86.9
1916	..	..	..	..	425	5.40	29.5	127.6
1917	..	..	..	..	569	5.48	35.7	106.7
1918	..	..	..	..	606	5.69	32.4	119.1
1919	..	..	..	..	377	5.85	21.1	91.5
1920	..	..	..	..	521	6.23	13.2	80.7
1921	..	..	..	..	140	6.38	6.26	48.0
1922	..	..	..	..	310	6.50	6.29	58.6
1923	..	..	..	..	523	6.04	7.83	66.6
1924	..	..	..	..	348	6.15	9.95	69.6
1925	..	..	..	..	317	6.28	9.05	84.2
1926	..	..	..	..	392	6.16	7.54	93.1
1927	..	..	..	..	321	6.20	11.1	118.2
1928	..	..	..	..	375	6.06	17.9	123.5
1929	..	..	..	..	366	6.19	23.7	122.1
1930	..	..	..	..	331	5.83	21.6	115.0
1931	..	..	..	..	196	5.82	24.9	87.3
1932	..	..	..	..	96.3	5.69	12.6	57.9
1933	..	..	..	..	154	5.99	9.67	59.2
1934	..	..	..	..	158 169	7.15 6.67	15.4	73.9
1935	..	..	..	..	245	6.34	17.5	72.0
1936	..	..	..	..	380	5.78	16.6	79.9
1937	..	..	..	..	425	5.75	16.5	90.2
1938	..	..	..	..	311	5.83	18.0	75.5
1939	..	..	..	..	375	5.77	18.6	103.9

TABLE A-1—INDIVIDUAL MINERALS (continued)

Year	(10) Molybdenum		(11) Tungsten		(12) Pennsylvania Anthracite		(13) Bituminous Coal	
	Quantity Mil. lb.	*Price* $ per lb.	*Quantity* Th. s.t.	*Price* $ per s.t.	*Quantity* Mil. s.t.	*Price* $ per s.t.	*Quantity* Mil. s.t.	*Price* $ per s.t.
1899	..	..	..	..	60.4	1.46	193	.869
1900	..	..	.046	240	57.4	1.49	212	1.04
1901	..	..	.179	155	67.5	1.67	226	1.05
1902	..	..	.184	185	41.4	1.84	260	1.12
1903	..	..	.292	149	74.6	2.04	283	1.24
1904	..	..	.740	249	73.2	1.90	279	1.10
1905	..	..	.803	335	77.7	1.83	315	1.06
1906	..	..	.928	376	71.3	1.85	343	1.11
1907	..	..	1.64	543	85.6	1.91	395	1.14
1908	..	..	.671	343	83.3	1.90	333	1.12
1909	..	..	1.62	379	81.1	1.84	380	1.07
1910	..	..	1.82	457	84.5	1.90	417	1.13
1911	0	..	1.14	358	90.5	1.94	406	1.11
1912	0	..	1.33	378	84.4	2.11	450	1.15
1913	0	..	1.54	437	91.5	2.13	478	1.18
1914	.00130	1.00	.990	439	90.8	2.07	423	1.17
1915	.182	.632	2.33	1,758	89.0	2.07	443	1.13
1916	.207	.992	5.92	2,038	87.6	2.31	503	1.32
1917	.350	1.14	6.14	1,104	99.6	2.85	552	2.26
1918	.862	1.46	5.06	1,393	98.8	3.40	579	2.57
1919	.298	1.15	.518	851	88.1	4.14	466	2.49
1920	.0349	.493	.216	471	89.6	4.85	569	3.75
1921	0	..	0	..	90.5	5.00	416	2.88
1922	0	..	0	..	54.7	5.01	422	3.02
1923	.0227	..	.241	600	93.3	5.43	564	2.68
1924	.297	..	.374	535	87.9	5.43	484	2.20
1925	1.15	.833	1.19	634	61.8	5.30	520	2.04
1926	1.43	.833	1.38	666	84.4	5.62	573	2.06
1927	2.30	.813	1.16	622	80.1	5.26	518	1.99
1928	3.43	.578	1.21	624	75.3	5.22	501	1.86
1929	4.02	.578	.830	788	73.8	5.22	535	1.78
1930	3.72	.550	.702	725	69.4	5.11	467	1.70
1931	3.13	.500	1.40	661	59.6	4.97	382	1.54
1932	2.43	.500	.396	552	49.9	4.46	310	1.31
1933	5.68	.749	.895	575	49.5	4.17	334	1.34
1934	9.36	.693	2.05	874	57.2	4.27	359	1.75
1935	11.5	.667	2.40	802	52.2	4.03	372	1.77
1936	17.2	.664	2.61	890	54.6	4.16	439	1.76
1937	29.4	.683	3.50	1,170	51.9	3.81	445	1.86
1938	33.3	.699	4.00	1,039	46.1	3.92	349	1.87
1939	30.3	.684	3.60	1,027	51.5	3.64	395	1.79

TABLE A-1—INDIVIDUAL MINERALS (continued)

(14) PETROLEUM AND NATURAL GAS

	(A) PETROLEUM									
	(A_1) PENNSYLVANIA GRADE		(A_2) ALL OTHER		(A_1) AND (A_2) TOTAL		(B) NATURAL GAS		(C) NATURAL GASOLINE	
Year	*Quantity* Mil. bbl.	*Price* $ per bbl.	*Quantity* Mil. bbl.	*Price* $ per bbl.	*Quantity* Mil. bbl.	*Price* $ per bbl.	*Quantity* Bil. cu.ft.	*Price* $ per Th. cu.ft.	*Quantity* Mil. gal.	*Price* $ per gal.
1899	33.0	1.30	24.0	.898	..	..	223	.090	..	..
1900	36.2	1.36	27.4	.979	..	..	237	.100	..	..
1901	33.5	1.22	35.9	.717	..	..	264	.103	..	..
1902	31.8	1.27	56.9	.542	..	..	281	.110	..	..
1903	31.0	1.59	69.5	.652	..	..	298	.120	..	..
1904	30.4	1.63	86.7	.595	..	..	310	.124	..	..
1905	28.2	1.40	107	.421	..	..	351	.118	..	..
1906	26.5	1.61	100	.499	..	..	389	.121	..	..
1907	24.5	1.75	142	.545	..	..	407	.133	..	..
1908	24.2	1.78	154	.557	..	..	402	.136	..	..
1909	25.9	1.65	157	.544	..	..	481	.131	..	..
1910	26.4	1.34	183	.504	..	..	509	.139	..	..
1911	23.3	1.31	197	.525	..	..	513	.145	7.43	.0716
1912	25.9	1.64	197	.618	..	..	562	.150	12.1	.0958
1913	25.4	2.48	223	.780	..	..	582	.151	24.1	.102
1914	23.6	1.90	242	.699	..	..	592	.159	42.7	.0728
1915	22.4	1.56	259	.558	..	..	629	.161	65.4	.0788
1916	21.8	2.45	279	.991	..	..	753	.160	103	.138
1917	21.8	3.24	313	1.44	..	..	795	.179	218	.184
1918	21.0	3.93	335	1.86	..	..	721	.213	283	.178
1919	22.5	3.96	356	1.89	..	..	746	{.216 / .0826}	352	.183
1920	..	..	..	..	443	3.07	798	.0942	385	.187
1921	..	..	..	..	472	1.73	662	.101	450	.137
1922	..	..	..	..	558	1.61	763	.111	506	.144
1923	..	..	..	..	732	1.34	1,007	.100	816	.0947
1924	..	..	..	..	714	1.43	1,142	.0927	934	.0881
1925	..	..	..	..	764	1.68	1,189	.0943	1,127	.107
1926	..	..	..	..	771	1.88	1,313	.0950	1,363	.100
1927	..	..	..	..	901	1.30	1,445	.0882	1,641	.0723
1928	..	..	..	..	901	1.17	1,568	.0892	1,814	.0766
1929	..	..	..	..	1,007	1.27	1,918	.0822	2,234	.0709
1930	..	..	..	..	898	1.19	1,943	.0757	2,210	.0580
1931	..	..	..	..	851	.647	1,686	.0697	1,832	.0348
1932	..	..	..	..	785	.867	1,556	.0636	1,524	.0323
1933	..	..	..	..	906	.671	1,555	.0624	1,420	.0383
1934	..	..	..	..	908	.996	1,771	.0601	1,535	.0394
1935	..	..	..	..	997	.965	1,917	.0576	1,652	.0429
1936	..	..	..	..	1,100	1.09	2,168	.0550	1,796	.0471
1937	..	..	..	..	1,279	1.18	2,408	.0513	2,065	.0470
1938	..	..	..	..	1,214	1.13	2,296	.0495	2,157	.0405
1939	..	..	..	..	1,265	1.02	2,477	.0485	2,169	.0415

TABLE A-1—INDIVIDUAL MINERALS (continued)

	(15) DIMENSION STONE							
	(A) DIMENSION GRANITE		(B) DIMENSION LIMESTONE		(C) DIMENSION MARBLE		(D) NONDIMENSION MARBLE	
Year	*Quantity* Mil. s.t.	*Price* $ per s.t.	*Quantity* Mil. s.t.	*Price* $ per s.t.	*Quantity* Th. s.t.	*Price* $ per s.t.	*Quantity* Th. s.t.	*Price* $ per s.t.
1899	..	..	..	..	..	..	..	..
1900	..	..	..	..	..	..	..	..
1901	..	..	..	..	..	..	..	..
1902	..	..	..	..	..	..	..	..
1903	..	..	..	..	..	..	..	..
1904	..	..	..	..	..	..	..	..
1905	..	..	..	..	..	..	..	..
1906	3.01	5.45	12.9	.668	..	..	..	..
1907	2.73	5.48	12.8	.699	..	..	..	..
1908	3.19	5.00	13.2	.673	..	..	..	..
1909	3.61	4.58	14.6	.622	..	..	..	..
1910	3.35	4.88	12.7	.754	..	..	..	..
1911	3.43	4.96	12.5	.751	405	17.9	150	1.95
1912	3.54	4.45	11.8	.780	291	26.3	158	.895
1913	3.60	4.69	10.6	.810	314	24.7	106	1.19
1914	3.62	4.47	9.98	.796	296	26.9	194	.889
1915	3.05	4.61	10.6	.798	263	25.7	165	.980
1916	4.55 1.74	3.06 7.28	8.59 1.27	1.12 3.92	274	24.9	136	1.54
1917	1.25	9.66	.999	4.46	184	33.1	126	1.83
1918	.961	11.8	.420	5.75	136	38.2	169	1.75
1919	1.12	13.9	.728	6.50	180	43.3	154	1.68
1920	1.20	16.3	.843	10.3	200	52.6	232	2.39
1921	1.16	13.6	.812	10.1	194	42.8	122	2.34
1922	1.12	13.4	1.24	10.4	243	41.5	185	2.56
1923	1.45	15.6	1.43	11.7	304	40.1	259	2.59
1924	1.54	14.4	1.50	11.0	324	39.0	192	3.36
1925	1.66	14.0	1.54	10.8	333	39.6	231	2.96
1926	1.59	14.6	1.66	12.6	336	40.1	227	3.08
1927	1.79	13.9	1.52	12.7	334	44.4	266	2.96
1928	1.64	15.1	1.77	11.9	343	46.3	237	2.30
1929	1.71	14.8	1.70	12.6	324	49.4	230	2.33
1930	1.33	16.6	1.94	9.96	282	43.8	196	2.89
1931	1.03	17.7	1.12	10.1	196	51.2	155	2.58
1932	.648	18.1	.641	11.1	179	40.7	164	1.44
1933	.477	16.7	.551	11.9	150	41.6	74.6	2.18
1934	.543	16.0	.586	6.18	81.7	39.1	95.6	1.84
1935	.536	14.9	.723	4.18	56.7	56.9	75.7	2.48
1936	.667	16.6	.805	6.11	97.8	56.6	68.0	3.37
1937	.751	15.2	.714	7.44	95.5	53.8	112	2.86
1938	.673	14.5	.704	7.01	89.0	55.9	130	2.11
1939	.734	13.4	1.06	6.30	124	51.0	104	3.68

TABLE A-1—INDIVIDUAL MINERALS (continued)

(15) DIMENSION STONE (continued)

Year	(E) DIMENSION SANDSTONE		(F) DIMENSION SLATE		(G) NONDIMENSION SLATE		(H) MISCELLANEOUS DIMENSION STONE	
	Quantity Th. s.t.	*Price* $ per s.t.	*Quantity* Th. s.t.	*Price* $ per s.t.	*Quantity* Th. s.t.	*Price* $ per s.t.	*Quantity* Th. s.t.	*Price* $ per s.t.
1899	..	..	392	10.1	..	..	..	..
1900	..	..	429	9.89	..	..	..	..
1901	..	..	467	10.2	..	..	..	..
1902	..	..	514	11.1	..	..	..	..
1903	..	..	502	12.5	..	..	..	..
1904	..	..	455	12.4	..	..	..	..
1905	..	..	456	12.0	..	..	..	..
1906	..	..	459	12.3	..	..	..	..
1907	..	..	482	12.5	..	..	..	..
1908	..	..	498	12.7	..	..	..	..
1909	..	..	424	12.8	..	..	..	..
1910	..	..	479	13.0	..	..	..	..
1911	..	..	436	13.1	..	..	..	..
1912	..	..	461	13.1	..	..	..	..
1913	..	..	441	14.0	..	..	..	..
1914	..	..	406	14.1	..	..	..	..
1915	..	..	378	13.1	..	..	..	..
1916	784	3.60	354	14.2	..	..	..	..
1917	626	3.93	305	17.1	..	..	..	..
1918	312	4.69	174	23.4	280	2.87	10.0	3.90
1919	435	5.99	207	23.6	203	5.70	33.2	1.30
1920	393	7.79	200	33.4	269	7.62	14.0	2.67
1921	480	7.24	180	33.0	232	6.03	25.1	2.00
1922	607	6.87	228	30.7	380	5.73	88.5	1.60
1923	801	6.05	245	36.0	462	7.07	33.5	4.20
1924	754	7.61	215	40.0	513	6.20	22.9	4.33
1925	981	6.64	227	41.3	498	6.45	24.8	2.61
1926	544	10.7	220	42.5	498	6.04	16.6	2.56
1927	606	10.0	232	37.0	460	6.04	107.4	2.83
1928	553	10.0	232	38.7	414	5.96	37.8	2.41
1929	656	8.06	241	36.3	429	5.82	200.4	1.46
1930	644	8.94	174	35.7	290	5.85	78.0	2.95
1931	327	9.88	138	30.2	230	5.71	22.0	3.85
1932	172	8.85	74.5	25.6	210	5.71	157.3	3.84
1933	90.2	11.9	73.2	20.7	186	6.33	29.9	12.3
1934	107	9.16	66.6	24.7	166	6.42	28.4	9.97
1935	101	9.82	104	22.6	227	5.78	14.0	18.8
1936	162	10.2	165	23.2	290	5.69	39.3	13.2
1937	232	7.43	168	24.0	277	5.70	64.1	10.7
1938	166	8.87	144	22.0	349	7.13	112.4	5.29
1939	196	10.0	180	22.8	352	7.34	83.5	8.67

TABLE A-1—INDIVIDUAL MINERALS (continued)

	(16) NONDIMENSION STONE							
	(A) NONDIMENSION BASALT		(B) DIMENSION BASALT		(C) NONDIMENSION GRANITE		(D) NONDIMENSION LIMESTONE (INCL. LIMESTONE USED FOR LIME)	
Year	*Quantity* Mil. s.t.	*Price* $ per s.t.	*Quantity* Mil. s.t.	*Price* $ per s.t.	*Quantity* Mil. s.t.	*Price* $ per s.t.	*Quantity* Mil. s.t.	*Price* $ per s.t.
1899	..	..	..	..	..	..	..	..
1900	..	..	..	..	..	..	..	..
1901	..	..	..	..	..	..	..	..
1902	..	..	..	..	..	..	..	..
1903	..	..	..	..	..	..	..	..
1904	..	..	..	..	..	..	..	..
1905	4.28	.650	.219	(1.35)	2.66	.808	42.5	.478
1906	5.05	.661	.292	(1.35)	2.94	.735	44.7	.488
1907	6.07	.705	.232	(1.35)	4.09	.761	48.9	.534
1908	6.06	.661	.207	(1.35)	3.10	.789	40.8	.532
1909	7.30	.651	.285	(1.35)	3.91	.784	50.9	.523
1910	9.20	.651	.346	(1.35)	5.58	.754	57.0	.500
1911	9.09	.667	.496	(1.35)	6.02	.693	55.3	.506
1912	9.20	.689	.902	(1.35)	4.61	.752	62.8	.494
1913	10.5	.695	1.36	(1.35)	4.87	.790	67.7	.499
1914	9.03	.690	1.21	(1.35)	5.22	.762	56.5	.521
1915	9.77	.655	1.55	(1.35)	5.24	.730	60.0	.507
1916	9.01	.726	1.23	.920	4.72	.750	66.3	.540
	9.88	.745	.352	.876	7.53	.635	73.6	.551
1917	8.68	.824	.425	.989	4.31	.802	69.7	.669
1918	6.71	1.12	.150	1.98	2.87	1.09	59.8	.880
1919	7.30	1.21	.111	1.10	3.10	1.22	55.7	.988
1920	9.15	1.33	.0656	1.23	3.56	1.52	65.6	1.15
1921	8.46	1.35	.0690	.988	3.59	1.35	49.9	1.11
1922	9.92	1.25	.116	1.71	4.79	1.27	65.0	.962
1923	10.6	1.25	.0866	2.94	5.85	1.21	83.4	.968
1924	11.6	1.26	.0579	1.45	5.35	1.24	82.5	.986
1925	11.7	1.24	.0947	1.68	6.41	1.13	93.2	.967
1926	12.8	1.23	.140	1.45	7.74	1.14	99.3	.978
1927	13.1	1.31	.0909	1.74	8.92	1.16	107.0	.948
1928	15.2	1.29	.0968	1.05	7.92	1.17	104.0	.937
1929	14.8	1.27	.0516	1.36	9.12	.971	107.5	.934
1930	14.5	1.17	.0394	1.90	8.72	.962	93.6	.930
1931	12.5	1.10	.0211	1.02	7.04	1.10	71.1	.924
1932	9.32	.951	.0133	1.42	4.47	.947	50.3	.884
1933	7.38	.892	.00989	1.17	3.95	.856	49.8	.837
1934	11.6	.968	.0113	1.15	6.25	.993	61.7	.881
1935	9.64	.964	.0306	.648	5.48	1.01	62.7	.839
1936	14.0	.955	.0374	1.13	14.8	.798	94.4	.882
1937	13.6	.921	.0251	1.11	8.51	1.03	102.1	.912
1938	13.9	.883	.0218	.986	9.76	1.14	87.7	.955
1939	16.0	.882	.101	.523	11.3	1.12	108.3	.883

TABLE A-1—INDIVIDUAL MINERALS (continued)

Year	(16) NONDIMENSION STONE (continued)						(17) SAND AND GRAVEL			
	(E) LIMESTONE USED FOR CEMENT (INCL. CEMENT ROCK)		(F) NONDIMENSION SANDSTONE		(G) MISCELLANEOUS NONDIMENSION STONE		(A) SAND		(B) GRAVEL	
	Quantity Mil. s.t.	*Price* $ per s.t.	*Quantity* Mil. s.t.	*Price* $ per s.t.	*Quantity* Mil. s.t.	*Price* $ per s.t.	*Quantity* Mil. s.t.	*Price* $ per s.t.	*Quantity* Mil. s.t.	*Price* $ per s.t.
1899	..	..	..	..	..	..	..	..	..	..
1900	..	..	..	..	..	..	..	..	..	..
1901	..	..	..	..	..	..	..	..	..	..
1902	..	..	..	..	..	..	..	..	..	..
1903	..	..	..	..	..	..	..	..	..	..
1904	..	..	..	..	..	..	..	..	..	..
1905	..	..	1.59	.633	..	..	18.8	.502	4.42	.407
1906	..	..	1.26	.708	..	..	24.5	.411	8.43	.312
1907	..	..	1.34	.739	..	..	28.6	.385	13.2	.262
1908	..	..	1.20	.755	..	..	24.5	.391	12.7	.290
1909	16.8	(.225)	1.72	.706	..	..	36.3	.348	23.3	.246
1910	19.6	(.248)	1.87	.752	..	..	36.8	.374	32.6	.223
1911	20.1	(.235)	2.30	.711	..	..	40.3	.359	26.6	.253
1912	21.1	(.227)	1.57	.743	..	..	38.6	.398	29.8	.260
1913	23.5	(.281)	1.77	.820	..	..	41.0	.375	38.5	.230
1914	22.5	(.259)	2.45	.774	..	..	40.1	.361	39.2	.240
1915	24.2	(.240)	2.42	.763	..	..	38.6	.350	38.0	.253
1916	23.5	(.308)	2.16 3.90	.771 .715	..	..	43.0	.409	46.1	.265
1917	24.7	(.378)	3.25	.938	..	..	40.8	.533	35.6	.380
1918	17.7	(.448)	2.55	1.20	.835	1.12	33.1	.736	28.7	.472
1919	19.9	(.478)	2.19	1.22	1.16	1.62	36.0	.734	34.6	.565
1920	24.9	(.565)	2.95	1.44	1.47	1.53	43.8	.895	38.3	.692
1921	24.5	(.530)	2.16	1.36	1.66	1.27	38.3	.759	41.6	.660
1922	30.2	(.493)	2.78	1.21	1.43	1.22	49.7	.714	45.2	.645
1923	34.9	(.531)	3.55	1.22	3.70	1.20	67.4 67.1	.720 .720	72.6 70.7	.585 .583
1924	38.0	(.506)	3.14	1.40	4.30	1.16	75.2	.646	77.6	.595
1925	41.0	(.496)	3.50	1.26	5.22	1.16	86.0	.637	79.0	.623
1926	42.0	(.479)	4.43	1.20	4.74	1.20	91.4	.604	83.8	.621
1927	44.2	(.453)	4.44	1.09	7.01	.951	92.8	.580	96.5	.589
1928	45.0	(.439)	4.16	1.19	6.79	.870	96.8	.576	103	.563
1929	43.6	(.416)	5.13	1.12	8.18	.948	97.0	.618	109	.596
1930	40.8	(.403)	3.95	1.15	8.53	.944	81.8	.598	95.1	.615
1931	31.7	(.311)	4.25	1.02	5.61	.951	62.4	.570	66.6	.615
1932	19.4	(.285)	2.80	.913	5.81	.684	40.4	.529	44.8	.582
1933	16.1	(.373)	2.71	1.13	9.43	.807	31.0	.607	35.1	.586
1934	19.7	(.432)	3.50	1.07	12.3	.866	34.6	.682	40.7	.609
1935	19.6	(.422)	2.91	1.23	6.82	.892	37.8	.664	46.8	.558
1936	28.6	(.423)	6.09	1.32	7.76	.990	54.6	.635	65.3	.575
1937	29.5	(.416)	4.84	1.20	10.4	.863	57.1	.677	68.2	.593
1938	26.2	(.406)	6.15	1.07	12.2	.810	48.3	.655	57.4	.581
1939	30.5	(.413)	8.66	1.13	9.30	.841	57.6	.635	60.8	.569

TABLE A-1—INDIVIDUAL MINERALS (continued)

Year	(18) CLAY (INCL. FULLER'S EARTH)								(19) GYPSUM	
	(A) KAOLIN, BALL CLAY, PAPER CLAY, MISCELLANEOUS AND FIRE CLAY		(B) KAOLIN, BALL CLAY AND PAPER CLAY		(C) MISCELLANEOUS CLAY, INCL. FIRE CLAY		(D) FULLER'S EARTH			
	Quantity Mil. s.t.	*Price* $ per s.t.	*Quantity* Th. s.t.	*Price* $ per s.t.	*Quantity* Mil. s.t.	*Price* $ per s.t.	*Quantity* Th. s.t.	*Price* $ per s.t.	*Quantity* Mil. s.t.	*Price* $ per s.t.
1899	.843	1.95	..	..	..	..	12.4	6.43	.486	1.55
1900	1.22	1.51	..	..	..	..	9.70	6.96	.594	1.56
1901	1.37	1.88	..	..	..	..	14.1	6.86	.634	1.42
1902	1.72 1.46	1.49 1.42	..	..	..	..	11.5	8.54	.816	1.41
1903	1.64	1.58	..	..	..	..	20.7	9.20	1.04	1.63
1904	..	..	158	4.58	1.35	1.18	29.5	5.72	.941	1.61
1905	..	..	182	4.39	1.62	1.21	25.2	8.52	1.04	1.68
1906	..	..	182	5.00	1.85	1.26	32.0	8.28	1.54	2.47
1907	..	..	166	4.99	2.02	1.30	32.9	8.88	1.75	1.93
1908	..	..	134	4.93	1.59	1.22	29.7	9.37	1.72	1.73
1909	..	..	162	5.20	2.00	1.31	33.5	9.01	2.25	1.62
1910	..	..	191	4.89	2.20	1.22	32.8	8.95	2.38	1.59
1911	..	..	192	4.67	1.99	1.30	40.7	9.41	2.32	1.52
1912	..	..	211	4.61	2.32	1.28	32.7	9.34	2.50	1.41
1913	..	..	222	4.68	2.43	1.29	38.6	9.58	2.60	1.51
1914	..	..	218	5.03	1.99	1.33	41.0	9.85	2.48	1.46
1915	..	..	216	5.00	2.15	1.35	47.9	10.2	2.45	1.37
1916	..	..	291	5.04	2.64	1.62	67.8	10.4	2.76	1.44
1917	..	..	314	5.84	2.80	2.22	72.6	10.6	2.70	1.80
1918	..	..	270	7.60	2.71	2.32	84.5	13.6	2.06	2.63
1919	..	..	218	9.16	2.06	2.48	106	18.8	2.42	2.98
1920	..	..	338	10.2	2.70	2.90	128	19.5	3.13	3.83
1921	..	..	217	8.92	1.53	2.69	106	18.7	2.89	3.52
1922	..	..	352	7.91	2.30	2.42	139	16.5	3.78	3.17
1923	..	..	434	8.18	3.00	2.55	149	15.1	4.75	3.04
1924	..	..	410	8.56	3.28	2.44	178	14.8	5.04	2.72
1925	..	..	477	8.22	3.55	2.48	207	14.2	5.68	2.78
1926	..	..	544	8.52	3.42	2.77	234	14.3	5.64	2.61
1927	..	..	574	8.23	3.28	2.74	264	14.2	5.35	2.47
1928	..	..	617	8.22	3.41	2.68	287	13.6	5.10	1.90
1929	..	..	636	8.28	3.71	2.58	316	13.6	5.02	1.97
1930	..	..	627	7.39	3.34	2.36	336	12.9	3.47	1.91
1931	..	..	526	6.82	1.99	2.39	288	10.6	2.56	2.02
1932	..	..	393	5.92	.999	2.88	228	9.76	1.42	2.09
1933	..	..	476	5.82	1.36	2.99	224	9.28	1.34	1.92
1934	..	..	489	6.38	1.70	2.99	220	9.47	1.54	1.90
1935	..	..	620	7.09	2.30	2.79	228	9.79	1.90	2.00
1936	..	..	740	7.07	3.04	2.69	231	9.81	2.71	1.94
1937	..	..	854	7.31	3.38	2.80	226	10.2	3.06	2.23
1938	..	..	690	7.94	2.04	3.08	171	10.0	2.68	2.22
1939	..	..	909	7.85	2.85	2.88	167	10.1	3.23	2.22

TABLE A-1—INDIVIDUAL MINERALS (continued)

Year	(20) SULFUR		(21) PYRITES		(22) PHOSPHATE ROCK		(23) POTASH		(24) FLUORSPAR	
	Quantity Th. l.t.	*Price* $ per l.t.	*Quantity* Th. l.t.	*Price* $ per l.t.	*Quantity* Mil. l.t.	*Price* $ per l.t.	*Quantity* Th. s.t.	*Price* $ per s.t.	*Quantity* Th. s.t.	*Price* $ per s.t.
1899	4.31	24.9	175	3.11	1.52	3.35	..	..	15.9	6.08
1900	3.15	28.0	205	3.67	1.70	3.59	..	..	18.4	5.12
1901	6.87	32.5	235	4.41	1.44	3.58	..	..	19.6	5.81
1902	5.00	20.4	228	4.26	1.50	3.15	..	..	48.0	5.66
1903	25.0	20.1	199	3.95	1.62	3.36	..	..	42.5	5.02
1904	85.0	20.9	207	3.93	1.99	3.51	..	..	36.5	6.44
1905	220	20.4	253	3.71	2.14	3.47	..	..	57.4	6.32
1906	295	17.3	261	3.56	2.00	4.12	..	..	40.8	5.98
1907	189	17.5	247	3.21	2.37	4.70	..	..	49.5	5.81
1908	364	18.1	223	3.85	2.66	4.78	..	..	38.8	5.83
1909	274	18.5	247	4.16	2.44	4.62	..	..	50.7	5.75
1910	247	18.0	242	4.05	2.63	4.11	..	..	69.4	6.20
1911	205	18.0	301	3.86	3.10	3.90	..	..	87.0	7.02
1912	788	17.3	351	3.80	3.19	3.93	..	..	117	6.60
1913	491	17.6	341	3.77	3.15	3.79	..	..	116	6.37
1914	418	18.2	337	3.81	2.65	3.51	..	..	95.1	5.99
1915	521	16.9	394	4.25	1.94	2.95	..	..	137	5.58
1916	650	16.0	439	4.64	2.17	2.97	3.99	485	156	5.92
1917	1,134	21.4	483	5.37	2.85	3.01	20.7	400	219	10.5
1918	1,354	22.0	464	5.69	2.28	3.30	39.7	382	264	20.7
1919	1,191	15.1	421	6.08	1.85	5.10	21.6 25.4	232 236	138	25.5
1920	1,255	20.0	311	5.14	3.98	6.11	41.0	173	187	25.3
1921	1,879	17.8	157	4.53	2.43	5.94	7.20	93.3	35.0	20.7
1922	1,831	16.4	169	3.97	2.34	4.34	9.32	39.2	142	17.9
1923	2,036	16.1	182	3.64	2.94	3.85	18.0	38.6	121	20.7
1924	1,221	16.3	160	4.03	2.85	3.57	19.4 22.9	38.1 38.5	125	19.6
1925	1,409	15.6	170	3.82	3.25	3.32	25.4	46.7	114	18.1
1926	1,890	18.0	167	3.70	3.59	3.39	23.4	43.2	129	18.2
1927	2,112	18.5	216	3.73	3.13	3.55	43.5	49.5	113	18.1
1928	1,982	18.0	182	3.33	3.52	3.55	59.9	50.2	140	18.9
1929	2,362	18.0	164 333	3.75 3.75	3.79	3.50	61.6	51.9	146	19.1
1930	2,559	18.0	348	2.96	4.04	3.56	61.3	52.8	95.8	18.2
1931	2,129	18.0	331	2.95	2.67	3.66	63.9	48.4	53.5	17.4
1932	890	18.0	190	2.63	1.70	3.36	62.0	37.8	25.3	15.5
1933	1,406	18.0	284	2.71	2.36	3.16	143	38.1	72.9	14.2
1934	1,422	17.9	433	2.81	2.90	3.54	144	24.7	85.8	16.2
1935	1,633	17.9	514	3.08	3.16	3.60	193	22.2	124	15.0
1936	2,016	18.0	547	3.04	3.46	3.40	247	31.3	177	17.6
1937	2,742	18.0	584	3.04	4.26	3.28	284	33.8	181	20.2
1938	2,393	16.8	556	3.03	3.86	3.46	317	34.0	80.4	19.9
1939	2,091	15.9	516	3.00	3.99	3.27	312	32.8	183	20.3

TABLE A-1—INDIVIDUAL MINERALS (continued)

Year	(25) Borates		(26) Bromine		(27) Sodium Carbonates and Sulfates (Natural)		(28) Magnesium Chloride and Sulfate		(29) Calcium Chloride	
	Quantity Th. s.t.	*Price* $ per s.t.	*Quantity* Mil. lb.	*Price* $ per lb.	*Quantity* Th. s.t.	*Price* $ per s.t.	*Quantity* Th. s.t.	*Price* $ per s.t.	*Quantity* Th. s.t.	*Price* $ per s.t.
1899	24.1	21.0	.433	.25	..	..	..	..	..	..
1900	25.4	21.0	.521	.27	..	..	..	..	..	..
1901	23.2	17.6	.552	.28	..	..	..	..	..	..
1902	20.0	19.3	.514	.25	..	..	..	..	..	..
1903	34.4	19.2	.598	.28	..	..	..	..	..	..
1904	45.6	15.3	.897	.30	..	..	..	..	..	..
1905	46.3	22.0	1.19	.15	..	..	..	..	..	..
1906	58.2	20.3	.938	.176	..	..	..	..	..	..
1907	52.8	21.2	1.00	.195	..	..	..	..	..	..
1908	25.0	39.0	.760	.0971	..	..	..	..	..	..
1909	41.4	37.0	.570	.101	..	..	..	..	12.9	4.92
1910	42.4	28.4	.245	.129	..	..	..	..	11.0	6.81
1911	53.3	29.4	.652	.170	..	..	..	..	14.6	6.24
1912	42.3	26.7	.647	.225	..	..	..	..	18.6	6.32
1913	58.1	25.7	.572	.202	..	..	..	..	19.6	6.63
1914	62.4	23.5	.577	.352	..	..	..	..	19.4	6.28
1915	67.0	25.0	.856	1.00	..	..	..	..	20.5	6.37
1916	104	23.3	.729	1.31	..	..	..	..	27.7	8.12
1917	109	33.2	.896	.550	..	..	..	..	30.5	14.8
1918	88.8	25.5	1.73	.562	..	..	..	..	26.6	18.9
1919	66.1	20.9	1.86	.666	27.2	22.4	..	..	26.1	12.3
1920	120	18.1	1.16	.642	40.2	29.4	..	..	27.8	19.4
1921	50.0	32.0	.712	.243	22.3	27.4	..	..	23.7	21.6
1922	85.2	31.7	1.01	.150	38.6	18.8	..	..	33.1	17.3
1923	137	29.2	.842	.174	45.5	18.7	..	..	45.0	14.8
1924	116	27.4	2.03	.292	61.1	16.5	..	..	58.8	19.8
1925	114	27.1	1.57	.312	55.8	18.0	42.6	29.4	67.9	20.4
1926	116	27.0	1.25	.343	76.4	17.3	38.3	27.2	82.3	20.8
1927	109	31.8	1.76	.322	90.3	15.7	34.9	28.7	95.7	20.3
1928	131	30.5	2.16	.300	86.4	18.8	35.5	28.8	102	19.5
1929	170	26.6	6.41	.274	110	17.7	45.2	23.9	114	18.4
1930	177	30.2	8.46	.249	123	14.6	36.6	29.2	116	19.0
1931	179	27.6	8.94	.208	111	12.8	33.1	29.7	86.2	19.6
1932	182	16.6	5.73	.206	87.6	12.5	29.7	30.1	66.3	17.6
1933	188	18.3	10.1	.201	117	9.94	38.8	28.3	57.8	15.5
1934	242	19.9	15.3	.210	105	13.4	42.5	29.8	76.7	15.0
1935	273	19.7	16.4	.212	132	11.0	54.8	23.5	83.5	12.4
1936	314	19.6	20.6	.196	154	9.34	63.8	25.5	126	15.2
1937	359	20.2	26.2	.198	185	9.69	64.8	24.4	102 97.1	12.8 13.3
1938	216	22.0	33.3	.198	180	10.2	70.7	22.5	96.5	12.6
1939	245	23.2	37.9	.201	262	9.75	85.8	22.2	108	12.1

TABLE A-1—INDIVIDUAL MINERALS (continued)

	(30) SILICA AND SILICATES (MAINLY FOR USE AS ABRASIVES)									
	(A) GARNET		(B) PUMICE AND PUMICITE		(C) GROUND SAND AND SANDSTONE, AND QUARTZ		(D) TRIPOLI		(31) ABRASIVE SANDSTONE	
Year	*Quantity* Th. s.t.	*Price* $ per s.t.	*Quantity* Th. s.t.	*Price* $ per s.t.	*Quantity* Th. s.t.	*Price* $ per s.t.	*Quantity* Th. s.t.	*Price* $ per s.t.	*Quantity* Th. s.t.	*Price* $ per s.t.
1899	2.76	35.6	..	..	43.5	5.05	..	..	..	..
1900	3.18	38.8	..	..	47.0	2.71	..	..	..	..
1901	4.44	35.6	..	..	48.5	3.94	..	..	..	..
1902	3.93	33.8	.700	3.93	51.5	4.44	..	..	..	..
1903	3.95	33.5	.885	3.01	64.2	3.64	..	..	..	..
1904	3.85	30.5	1.53	3.54	84.2	2.08	..	..	..	..
1905	5.05	29.3	1.83	3.02	70.2	2.74	..	..	..	..
1906	4.65	33.8	12.2	1.37	90.8	4.02	..	..	..	..
1907	7.06	30.0	8.11	4.17	33.2	6.74	..	..	..	..
1908	2.00	32.4	10.6	3.72	47.3	4.02	..	..	..	..
1909	2.97	34.4	15.1	2.21	135	1.84	..	..	..	..
1910	3.81	29.8	23.3	4.08	63.6	3.05	..	..	..	..
1911	4.08	29.9	21.7	4.08	87.9	1.76	..	..	..	..
1912	4.95	33.0	27.1	3.19	97.9	1.96	..	..	..	..
1913	5.31	34.6	24.6	2.26	97.9 205	2.06 3.26	20.8	10.4	..	..
1914	4.23	34.4	27.6	2.14	153	2.35	17.2	8.27	..	..
1915	4.30	32.5	27.7	2.28	208	3.17	30.7	4.20	..	..
1916	6.17	33.8	33.3	2.47	199	3.68	43.3	4.98	..	..
1917	5.00	39.7	35.3	2.40	675	2.24	26.1 26.1	3.55 13.0	61.4	21.4
1918	4.70	52.8	30.6	2.98	171	5.15	20.0	10.0	66.3	29.6
1919	4.94	62.7	36.1	3.24	111	5.99	24.3	7.47	48.3	32.5
1920	5.48	79.3	41.8	2.74	227	6.64	40.2	14.2	54.6	35.5
1921	3.05	85.5	37.1	4.27	117	7.58	12.3	17.3	27.2	51.5
1922	7.05	80.4	45.3	3.88	174	6.68	30.2	10.5	27.5	44.2
1923	9.01	76.4	56.6	3.79	117	7.18	27.1	14.1	47.8	40.2
1924	8.29	81.3	43.7	4.36	228	7.32	28.5	13.7	39.2	49.1
1925	8.43	84.6	40.4	4.43	213	7.16	29.4	14.8	38.3	51.6
1926	6.40	81.9	53.9	3.87	224	7.47	31.4	16.7	40.0	52.4
1927	6.94	82.7	53.3	4.16	192	7.10	26.1	17.1	33.0	54.2
1928	6.62	69.4	57.4	4.85	190	7.30	34.0	16.3	34.2	50.8
1929	5.96	73.0	67.0	5.27	209	7.06	38.0	14.4	28.6	50.9
1930	5.00	62.8	56.8	5.91	169	6.69	32.4	15.6	19.4	46.9
1931	2.95	65.5	68.8	4.92	123	6.65	26.7	11.6	9.09	46.6
1932	1.95	75.6	53.2	4.42	158	5.93	14.8	15.8	8.00	38.9
1933	2.79	80.4	61.2	3.95	213	5.52	20.9	16.8	14.8	36.6
1934	2.59	82.9	56.2	3.69	250	5.72	20.5	16.0	13.0	42.8
1935	3.06	83.8	60.0	4.12	280	5.99	27.4	14.0	15.0	40.7
1936	3.82	82.7	72.9	4.50	367	6.04	28.5	13.8	13.9	44.5
1937	4.86	78.7	71.0	4.25	341	6.05	34.9	12.9	15.4	44.7
1938	2.67	71.8	65.7	4.76	256	5.92	22.2	14.8	6.72	55.1
1939	4.06	68.7	89.2	4.76	345	6.03	33.5	13.9	11.1	49.0

TABLE A-1—INDIVIDUAL MINERALS (continued)

Year	(32) Asphalt and Related Bitumens		(33) Talc		(34) Barite		(35) Magnesite		(36) Feldspar	
	Quantity Th. s.t.	*Price* $ per s.t.	*Quantity* Th. s.t.	*Price* $ per s.t.	*Quantity* Th. s.t.	*Price* $ per s.t.	*Quantity* Th. s.t.	*Price* $ per s.t.	*Quantity* Th. l.t.	*Price* $ per l.t.
1899	75.1	7.37	79.4	9.68	41.9	3.33	1.28	14.4	21.6	9.79
1900	54.4	7.65	91.4	9.66	67.7	2.78	2.25	8.6	22.2	8.17
1901	63.1	8.80	97.8	9.29	49.1	3.22	3.50	3.0	31.0	7.11
1902	84.6	5.46	98.0	11.6	61.7	3.29	2.83	3.0	40.4	6.19
1903	55.1	8.78	86.9	9.67	50.4	3.02	3.74	2.8	37.4	6.86
1904	64.2	6.56	91.2	10.3	65.7	2.66	2.85	3.3	40.3	6.60
1905	62.9	4.85	96.6	11.2	48.2	3.08	3.93	3.9	31.6	7.15
1906	73.1	9.24	121	11.9	50.2	3.19	7.80	3.0	64.9	6.19
1907	85.9	10.8	140	11.0	89.6	3.26	7.56	3.0	82.0	6.82
1908	78.6	6.59	117	11.9	38.5	3.13	6.59	3.0	62.9	6.81
1909	99.1	5.78	130	9.38	61.9	3.39	9.46	4.0	68.3	6.21
1910	98.9	8.64	151	10.6	43.0	2.83	12.4	6.0	72.4	6.94
1911	87.1	9.39	144	11.5	38.4	3.19	9.38	8.0	82.8	7.00
1912	95.2	9.09	159	10.7	37.5	4.09	10.5	8.0	77.3	6.73
1913	92.6	8.11	176	10.9	45.3	3.45	9.63	8.0	108	7.19
1914	79.9	8.04	172	10.8	52.7	2.95	11.3	11.0	121	5.21
1915	75.8	6.95	187	10.1	109	3.51	30.5	9.0	93.9 93.9	5.21 3.59
1916	98.5	9.38	213	10.6	222	4.56	155	8.99	118	3.42
1917	81.6	9.48	219	10.5	207	5.66	317	9.15	127	3.75
1918	60.0	13.0	208	12.9	155	6.73	232	7.83	88.5	4.86
1919	88.3	7.74	185	12.7	209	8.25	156	7.99	63.4	5.49
1920	198	6.12	211	14.4	228	9.39	304	9.05	136	6.28
1921	296	6.70	122	14.4	66.4	8.02	47.9	10.6	91.9	6.72
1922	328	6.87	199	14.4	155	7.25	55.8	10.2	117	7.21
1923	400	7.21	197	15.3	214	7.77	147	7.50	145	7.29
1924	562	7.04	204 178	17.2 12.5	196	7.85	120	8.67	205	7.37
1925	585	7.09	182	11.0	228	7.47	121	11.9	186	7.08
1926	715	6.27	182	11.6	238	7.45	134	8.99	210	7.65
1927	839	6.68	192	11.6	214	6.57	121	8.98	202	7.04
1928	808	6.41	203	12.5	260	6.51	127	8.64	211	6.73
1929	804	6.80	220	12.0	276	6.67	188	7.99	198	6.46
1930	703	6.35	179	11.8	238	6.55	129	7.99	172	6.21
1931	503	5.82	164	11.3	211	5.70	73.6	6.78	147	5.85
1932	340	5.71	123	11.0	134	5.74	38.5	7.37	105	5.15
1933	313	5.45	166	10.4	146	5.08	108	7.76	151	5.17
1934	441	5.37	138	10.5	178	5.29	101	7.24	154	5.53
1935	347	6.19	173	10.7	218	5.56	177	6.73	190	5.30
1936	581	5.61	216	10.8	274	5.91	207	6.82	245	5.32
1937	485	6.22	230	11.1	361	6.30	203	7.29	269	5.15
1938	478	6.02	213	10.8	335	6.47	97.0	7.47	196	4.56
1939	460	6.67	254	10.6	366	6.11	199	7.36	253	4.39

TABLE A-1—INDIVIDUAL MINERALS (concluded)

Year	(37) MICA (A) UNCUT SHEET AND PUNCH		(37) MICA (B) SCRAP		(38) ASBESTOS		(39) GRAPHITE	
	Quantity Mil. lb.	*Price* $ per lb.	*Quantity* Th. s.t.	*Price* $ per s.t.	*Quantity* Th. s.t.	*Price* $ per s.t.	*Quantity* Th. s.t.	*Price* $ per s.t.
1899	.109	.650	1.50	20.5	.681	17.2	3.77	44.3
1900	.456	.203	5.50	10.0	1.05	15.5	3.37	58.7
1901	.360	.275	2.17	9.08	.747	18.1	2.79	60.0
1902	.373	.225	1.40	25.0	1.00	16.1	6.71	27.2
1903	.620	.191	1.66	15.1	.887	18.9	18.9	12.0
1904	.668	.164	1.10	9.90	1.48	17.4	19.8	16.3
1905	.925	.174	1.13	15.9	3.11	13.8	25.0	12.7
1906	1.42	.177	1.49	15.3	1.70	16.9	19.8	17.2
1907	1.06	.329	3.02	14.1	.653	18.2	29.3	10.1
1908	.973	.241	2.42	14.0	.936	21.0	2.59	80.4
1909	1.81	.130	4.09	11.3	3.08	20.3	8.24	41.9
1910	2.48	.115	4.06	13.1	3.69	18.5	4.20	79.8
1911	1.89	.164	3.51	13.0	7.60	15.8	3.62	79.7
1912	.845	.335	3.23	15.2	4.40	20.0	3.84	57.5
1913	1.70	.208	5.32	15.5	1.10	10.0	4.78	61.5
1914	.557	.500	3.73	13.8	1.25	15.2	4.34	74.8
1915	.554	.683	3.96	12.8	1.73	44.5	4.72	91.1
1916	.866	.606	4.43	15.8	1.64	110	8.09	116
1917	1.28	.591	3.43	15.4	1.96	149	13.6	85.9
1918	1.64	.445	2.29	14.5	.998	119	13.0	117
1919	1.55	.313	3.26	17.8	1.16	214	7.42	105
1920	1.68	.325	5.72	29.2	1.65	412	9.51	65.8
1921	.742	.160	2.58	22.1	.831	406	2.44	39.6
1922	1.08	.180	4.76	18.2	.067	151	3.12	34.7
1923	2.06	.151	6.03	20.4	.227	42.4	6.04	31.6
1924	1.46	.145	4.71	18.5	.300	142	4.97	17.6
1925	1.79	.179	9.70	17.9	1.26	41.1	4.67	20.7
1926	2.17	.184	7.04	19.4	1.36	99.2	5.47	40.1
1927	1.51	.140	6.28	17.5	2.98	113	5.21	44.7
1928	1.68	.137	7.76	17.1	2.24	157	5.61	52.9
1929	2.04	.141	6.25	18.9	3.16	111	6.46	48.1
1930	1.47	.121	6.73	16.2	4.24	68.2	..	..
1931	.963	.116	6.62	15.0	3.23	36.9	..	..
1932	.339	.135	7.04	11.9	3.56	29.6	..	..
1933	.365	.146	8.75	11.2	5.02	27.5	..	..
1934	.584	.155	7.72	12.9	6.54	31.1	..	..
1935	.937	.172	12.2	10.9	9.42	32.8	..	..
1936	1.32	.155	12.7	10.5	10.9	28.4	..	..
1937	1.69	.168	14.7	14.0	13.9	28.5	..	..
1938	.940	.148	13.7	12.4	12.9	23.7	..	..
1939	.814	.171	14.7	13.8	15.1	33.2	..	..

General Note to Table A-1

Output relates to production data where such figures are available, otherwise to sales or shipments. So far as possible prices are given in mine values, except in the cases of gold, silver, copper, lead and zinc, for which market prices are shown instead (see Appendix B for explanation).

Except where otherwise noted, all data come from *Mineral Resources of the United States* (published annually for 1899 to 1923 by the U. S. Geological Survey, and for 1924 to 1931 by the U. S. Bureau of Mines); and from *Minerals Yearbook* (published for 1932–33 and annually for 1934 to the present by the U. S. Bureau of Mines).

The following abbreviations are used in the table.

Bbl.	barrel (42 gallons)
Th.	thousand
Mil.	million
L.t.	long ton (2,240 lb.)
S.t.	short ton (2,000 lb.)
F. oz.	fine ounce
Cu. ft.	cubic foot

(1) Iron ore:

Quantity data relate to production. The fourfold breakdown is not entirely definitive, since for most years small amounts of each of the ores are known to have been wrongly classified. The data exclude ores containing more than 5 percent of manganese. For 1899–1905 figures differ from the totals in *Mineral Resources* because we have excluded such ores in order to maintain comparability with later years; prior to 1906 the *Mineral Resources* figures include ores containing up to 40 percent of manganese (see note on manganese ore, below).

Prices are unit values at the mine. They represent commercial selling prices only in part: most iron ore mined in the United States is smelted by the producers in their own furnaces, and the value placed upon such ore is an accounting rather than an actual sale value. For 1920 and later years prices for carbonate are not available, and the quantity data for this ore have been disregarded in the construction of the indexes.

(2) Manganese ore:

Quantity data refer to production in 1899–1910 and to shipments in all other years. Ores containing more than 5 percent of manganese are included here; those with less than 5 percent of manganese are regarded as iron ore. As noted, a slight change in classification occurs between 1914 and 1915, but the quantitative importance of the break is small; column (A) is treated as comparable with column (B), column (C) with columns (D) and (E).

For the years 1899–1905 *Mineral Resources* includes 5 to 40 percent manganese ores with iron ore and, therefore, does not present a distinct series for such ores. We derived our data for these years from figures found in the manganese chapters of *Mineral Resources* relating to the production of manganiferous silver ores and manganiferous ores used for fluxing. For 1906 figures for Colorado fluxing ores are not available: our data include estimates for such ores based on the data for 1905 and 1907. In 1919 two sets of figures are shown. That comparable with later years excludes ores used for fluxing and that comparable with earlier years includes such ores. Fluxing ores are of declining importance following 1919, and disappear entirely beginning with 1929. They are, however, important for some of the years (especially in the 10 to 35 percent group) but suitable value figures were not available.

(3)–(7) Gold, silver, copper, lead, and zinc:

See Appendix B for a discussion of some of the problems posed by the statistics for the industries producing these metals. In general the quantity data are official estimates of the recoverable metal content of the various metalliferous ores mined

during the year. The "prices" are those used by the Bureau of Mines to value production, and relate to the manufactured product, either smelted or refined. However, the value data in Table A-2 are on a mine basis, and these values were used in combining indexes for the several nonferrous metal mining industries.

(3) Copper, 1904–39:

The quantity data comprise total copper production, together with gold and silver produced from copper ores. For copper in 1904 and 1905 smelter output alone was available. We estimated recoverable content of ores mined on the basis of the 1906 relationship between mine (recoverable content) and smelter output. The figures for 1904 and 1905 were not used in constructing indexes: see (7) below.

(4) Lode gold and silver, and lead and zinc outside the Mississippi Valley, 1906–39:

The quantity data comprise all gold and silver production except amounts derived from copper ore (see column 3) and placers (see column 6); together with all lead and zinc produced in states other than those included in the Mississippi Valley classification (see below). For lead and zinc in 1906 smelter or refinery output alone was available. We estimated the recoverable content of ores mined on the basis of the 1907 relationship between mine (recoverable content) and smelter output. For lead in 1928 and 1929, production in Virginia had to be estimated. For lead in 1930 and all later years, Tennessee's production has been included. No overlap is necessary because this state's 1929 production was zero. For zinc the second 1929 figure and data for all later years include Tennessee's production since it could not be segregated. The first 1929 figure and data for all earlier years exclude Tennessee's production, the output of Tennessee being estimated in 1928 and 1929.

(5) Lead and zinc in the Mississippi Valley, 1906–39:

The quantity data comprise all lead and zinc produced in Arkansas, Illinois, Iowa, Kansas, Kentucky, Missouri, Oklahoma, Tennessee, and Wisconsin. In the computation of productivity, fluorspar from Illinois and Kentucky has to be included in the measurement of this industry's output because the employment data cannot be segregated. However, in measuring mining output as a whole (Table A-7) we have omitted the fluorspar shown here, since it partly duplicates column (24). For lead and zinc in 1906 smelter output alone was available. We estimated the recoverable content of ores mined on the basis of the 1907 relationship between mine (recoverable content) and smelter output. For lead in 1930 and all later years, Tennessee's production has been excluded. No overlap is necessary because this state's 1929 production was zero. For zinc the second 1929 figure and data for all later years exclude Tennessee's production because it was not published separately. The first 1929 figure and data for all earlier years include Tennessee's production; the output of this state is estimated for 1928 and 1929.

(6) Placer gold and silver:

The quantity data comprise all gold and silver produced from placers.

(7) Lode gold and silver, and copper, lead and zinc, 1899–1906:

The data for years prior to 1906 do not permit the allocation of the total production of these metals to the several mining industries producing them. Total production, therefore, is expressed in terms of a breakdown according to product rather than according to industry. Furthermore, these figures relate to the metal recovered from domestic ores during the year as smelter or refinery products rather than to the recoverable content of ores mined during the year. It should be noted, too, that the totals duplicate 1904 and 1905 production in the copper industry; the figures shown in this column were used in constructing our indexes.

(8) Bauxite:

Quantity data relate to shipments for all years, but the latter are believed to approximate production closely, for bauxite is usually shipped as soon as mined.

Footnotes to Table A-1 continued on next page.

Footnotes to Table A-1, continued.

Bauxite is shipped in several forms—crude, dried, calcined, etc.—with widely varying moisture content. Consequently the actual tonnage shipped is not a perfect measure of the amount of bauxite shipped. However, the first set of 1934 figures and data for all earlier years relate to the actual tonnage of material as shipped. In the second set of 1934 figures and data for all later years the several forms of bauxite have been converted to a common product—the "dried bauxite equivalent" of the shipped material. For 1916 and earlier years the quantity data shown will be found only in *Mineral Resources, 1918,* Vol. I, p. 516. The data published in later reports of the Bureau of Mines are figures which, according to the text discussion on page 514 of the 1918 report, are not as accurate as the data we have used. The Bureau of Mines apparently continues to reproduce them because the differences are slight in most years, and the unrevised figures had already been widely quoted. Our price data for these years are derived from the unrevised quantity and value figures.

(9) Mercury (1 flask = 76 lbs.):

Quantity data relate to production for all years. The price series is for the average price of mercury on either the New York or the San Francisco market.

(10) Molybdenum:

Quantity data relate to the molybdenum content of concentrates, whether produced by molybdenum mines and mills, or as a byproduct of other activities such as copper mining. For 1914–26 quantity data relate to shipments and for 1927–39 to production. The serious beginning of a molybdenum industry apparently dates from 1914 since, according to *Mineral Resources, 1918,* Vol. I, p. 795, no molybdenum ore was produced in 1911, 1912 or 1913, and only small amounts were extracted before that time. For 1930 production figures were published only in terms of molybdenum sulfide; we converted the figure in question to a basis of molybdenum.

Prices for the entire period were derived from a comparison of the value and quantity of shipments; such values were in most cases estimated by the Bureau of Mines. Since no prices are available for 1923 and 1924, the price shown for 1925 was used in constructing output indexes for these years.

(11) Tungsten:

Quantity data relate to tungsten concentrates reduced to an equivalent of 60 percent tungsten trioxide (WO_3). For 1901–05 the tungsten trioxide equivalent of concentrates reported is not known exactly, and may have been somewhat higher than 60 percent. For the years 1900–36 the figures refer to shipments, for 1937–39 to production. However, we have transferred 191 tons of 60 percent WO_3 concentrates, valued at $87,000, from 1924 to 1919, for this amount was apparently produced in 1919 but not sold until 1924. There was some production prior to 1900 but it appears to have been insignificant (see *Mineral Resources, 1915,* Vol. I, p. 823). Prices for the entire period were derived from a comparison of the published value and quantity of shipments.

(12) Pennsylvania anthracite:

Quantity data relate to production in all years. Only anthracite mined in Pennsylvania is covered by the statistics. Small amounts of anthracite and subanthracite produced outside Pennsylvania are included with bituminous coal (see notes to column 13, bituminous coal). Bootleg production of Pennsylvania anthracite is not covered by the statistics.

(13) Bituminous coal:

Quantity data relate to production in all years. The figures cover all coal produced in the United States other than Pennsylvania anthracite. Included are the small quantities of hard coal produced outside Pennsylvania and the lignite of the Dakotas, Texas and Montana. (In 1938 such anthracite and lignite comprised only 0.97 percent of the total tonnage.) The Bureau of Mines does not attempt to include in the statistics the output of mines producing less than 1,000 tons a year.

Therefore, country coal banks have not been included and wagon mines have been canvassed (indirectly, through rail shipments) only in those years when prices were high enough to call forth sizable production on their part. The excluded output of these small, irregular operators is believed not to exceed 1 million tons a year. For 1916–39 production in Alaska has been excluded. In all other years Alaska is included because its production could not be segregated. Since its output is slight in all years the break in comparability in 1915 is of little importance.

The price series represents the average value of coal at the mine. It is not entirely based on commercial selling prices, since a large part of production is either used directly at the mine (for colliery fuel or the manufacture of coke) or is the output of "captive mines" which transfer the product to the parent concern in a bookkeeping transaction. The value of such production is estimated by the producer. For 1937 and years following the Bureau of Mines has revised the basis of its price series which now includes selling costs, and therefore differs from the earlier mine value series. For 1936 both prices are available. We have estimated mine values for 1937, 1938 and 1939, using the ratio of the two figures for 1936.

(14) Petroleum and natural gas (1 barrel of petroleum = 42 gals.):

Quantity data relate to the production of petroleum and natural gasoline and to the marketed production of natural gas. The production series do not each define a single industry. Natural gas and its byproduct, natural gasoline, are produced in part from oil wells and in part independently. A breakdown according to the two sources of production is not available. Data for Pennsylvania grade petroleum are estimates derived by combining published production figures for New York, Pennsylvania, West Virginia and southeastern and central Ohio.

For natural gas the quantity figures prior to 1906 are estimates by F. G. Tryon and were obtained from "contemporary estimates of the quantity of coal displaced by gas or of the value of gas sold" (see Arthur F. Burns, *Production Trends in the United States since 1870,* National Bureau of Economic Research, 1934, pp. 292, 333). We have derived unit values for these years by using the production figures shown in the table and Bureau of Mines estimates of the total value of gas sold, which may not be comparable. Prices shown for natural gas in 1899–1918, and the first price shown for 1919, relate to value at the point of consumption; the second price for 1919 and prices for 1920–39 refer to value at the well; such value was estimated for 1919–21 on the basis of its relation to value at the point of consumption in 1922.

Little or no natural gasoline was produced prior to 1911.

(15) and (16) Dimension and nondimension stone:

For a discussion of methods of classifying the stone industries, and for reasons underlying the choice of the short ton as a physical unit, see Appendix C. The breakdown between dimension and nondimension stone is made according to industry rather than product. Because nondimension marble and slate are primarily byproducts of the corresponding dimension stone, they are included as part of the output of the dimension industry. For a like reason dimension basalt is included as a product of the nondimension industry. The presentation of two sets of data for dimension and nondimension granite, limestone and basalt, and for nondimension sandstone, in 1916 is necessary because of a change in the manner in which the original data were published. In the first set of figures shown for 1916, and in the figures for all earlier years, the products labeled nondimension include only stone crushed for concrete aggregate, railroad ballast and road metal; while the products labeled dimension include, in addition to regular dimension stone, all other forms of nondimension stone. In the second set of figures for 1916, and in the figures for all later years, the product classification comprises only the regular products indicated. These products include, in the case of dimension stone, building stone (including rubble), monumental stone, paving blocks, curbing, flagging; and in the case of nondimension stone, riprap and all varieties of crushed and broken stone.

Footnotes to Table A-1 continued on next page.

Footnotes to Table A-1, continued.

(15) Dimension stone:

Quantity data relate to sales throughout.

A. Dimension granite. For 1915 and earlier years value of sales alone is available. Quantities were estimated by deflating these value figures by an average price derived from quantity and value data for important producing states. These states are: 1906–11, Vermont; 1912, Maine, Minnesota, New Hampshire and Vermont; 1913–15, Maine, Minnesota, New Hampshire, Vermont and Wisconsin. The prices so obtained were adjusted to a United States level by ratios derived in years when a United States price was available.

B. Dimension limestone. For 1915 and earlier years value of sales alone was reported. Quantities were estimated by deflating these value figures by an average price derived from quantity and value data for Lawrence and Monroe counties, Indiana, important dimension limestone producing centers. The prices so obtained were adjusted to a United States level by ratios derived in years when a United States price was available.

C. Dimension marble and D. Nondimension marble. For 1911–15 separate data for dimension and nondimension marble were not published. Our distribution between the two products was estimated by assuming that sales reported in cubic feet or in square feet referred to the dimension product, while those reported in short tons referred to nondimension stone. Sales reported in cubic feet were converted to short tons by a ratio derived in years when data were available in both forms. Sales reported in square feet were converted to short tons by dividing their value by the average price per ton for quantities reported in cubic feet, already so converted.

E. Dimension sandstone. For years prior to 1916 no data adequate for estimating quantities could be discovered.

F. Dimension slate. Most dimension slate is roofing slate; the remainder is called millstock, and includes electrical, structural and sanitary slate, grave vaults, blackboards and bulletin boards, billiard table tops and school slates. Quantity figures covering all millstock are not available for years prior to 1916. For 1907–15 quantity figures are available for the greater part of these sales, and value figures for the remainder. The quantity of this remainder was estimated by dividing its value by the price of blackboard slate. For 1899–1906 value figures only are available for millstock; its quantity was estimated by dividing its value by the average price of millstock for 1907–15. During this period millstock was usually less than 10 percent of all slate; the remaining 90 percent consisted of roofing slate, for which quantity and value data are available throughout. For 1918 and earlier years, however, quantity data for roofing slate and for millstock (where available) were reported in square feet only; their conversion to short tons was a simple matter, for the ratios (derived from later years) scarcely vary.

G. Nondimension slate (slate granules). No data are available prior to 1918.

H. Miscellaneous dimension stone. For 1917 no quantity data are available, and for 1916 and earlier years miscellaneous varieties of dimension stone were reported with such other categories as they resembled most closely. For 1918–31 rubble is not included, since it could not be separated from riprap.

(16) Nondimension stone:

For limestone used for lime and cement, quantity data refer to production; elsewhere they relate to sales. The figures for nondimension basalt, granite, limestone (not including limestone for lime) and sandstone include noncommercial production. Noncommercial production represents tonnages reported by states, counties, municipalities and other government agencies, produced either by themselves or by contractors expressly for their consumption, often with publicly owned equipment. Such production is not important prior to 1929: it can be segregated only for all varieties of stone taken together (see note k to Table A-5; also Appendix C).

For dimension basalt in 1915 and prior years, value of sales alone is available.

Quantities were estimated by applying the average price for 1916–38 to the value figures reported.

For nondimension limestone, including limestone for lime, prices were calculated from quantities and values reported for limestone other than that used for lime. For 1914 and earlier years quantities consumed in the manufacture of lime were estimated by multiplying lime production by an average ratio between limestone consumed and lime produced in years for which both kinds of data are available.

For limestone used in making cement (cement rock) quantity figures relate to material consumed in the manufacture of Portland and natural cements. For 1914 and earlier years such quantities were estimated by multiplying total cement production by the average ratio between limestone or cement rock consumed and cement produced in years for which both kinds of data are available. For years prior to 1909 this ratio did not seem adequate (because of a change in the composition of cement production) and no data are offered. Cement manufacturers usually quarry their own limestone, and it does not enter commercial channels; for this reason the output of limestone for cement is difficult to value. To obtain a price for index number weighting, we may either adopt that used for other nondimension limestone, or we may derive a price from that for cement. The latter procedure was chosen. The figure for 1929 comes from page 363 of "Mines and Quarries, 1929," *Fifteenth Census of the United States*. Prices for all other years were estimated by applying the ratio between this price and the 1929 price for manufactured cement to the cement price for the year, the latter calculated from quantity and value data in *Minerals Yearbook*. Because of the arbitrary character of the series it is shown in parentheses.

For miscellaneous nondimension stone in 1917 no quantity data are available, and for 1916 and earlier years miscellaneous varieties of nondimension stone were reported with such other categories as they most closely resembled. For 1918–31 miscellaneous varieties of rubble are treated as nondimension because they could not be separated from riprap.

(17) Sand and gravel:

Quantity data relate to sales throughout. Much sand and gravel is produced by noncommercial operators. These comprise government agencies, and contractors producing directly for government agencies, the output being reported by the latter. The first set of data for 1923, and data for earlier years, include noncommercial production, which cannot be segregated from commercial; the second set of figures for 1923, and data for later years, exclude such production. Data for noncommercial production, which has increased in importance in recent years, do not appear to be reliable: see *Statistical Appendix to Minerals Yearbook, 1932–33*, pp. 289-91. For 1902–04 data relating to the combined production of sand and gravel are available, but we have made no use of these figures, since they appear to suffer from serious undercoverage.

(18) Clay (including fuller's earth):

Quantity data relate to sales. The figures include only marketable clay, and do not cover much greater quantities of so-called common clay, mined by manufacturers of brick, tile and other heavy-clay products for their own use in nearby plants. For 1899–1903 we combined all varieties for which data are reported, except fuller's earth, into a single classification, because the breakdown given for these years did not seem satisfactory. The first set of data for 1902, and data for earlier years, include certain clays whose production is unreported in later years.

(19) Gypsum

Quantity data relate to crude gypsum mined. With the exception of the years 1937–39 no value is available for crude gypsum, and even for these years the value is estimated by producers, since the material does not enter the market in this form. Our prices are, therefore, derived from data relating to the quantity and value of

Footnotes to Table A-1 continued on next page.

Footnotes to Table A-1, continued.

uncalcined gypsum products sold, since this represented the closest approximation to a crude unit value available in most years.

(20) Sulfur:

Quantity data relate to production in all years. The figures for 1902 and 1903 are unpublished data furnished to the authors by Mr. Robert H. Ridgway of the Bureau of Mines. (The revisions in the data for all years prior to 1918, according to additional information made available to the Geological Survey, apparently did not affect the figures for 1899–1901, since the unrevised figures for those years are still considered accurate by the Bureau of Mines.) Prices are derived from the quantity and value of sulfur shipped, except in 1902 and 1903. In these years the value of shipments is not available, and we have used a price derived from data in *The Mineral Industry, 1903* (The Engineering and Mining Journal, 1904), p. 315.

(21) Pyrites:

Quantity data relate to production of pyrite ores and concentrates. Since 1925 the production of pyrites as a byproduct of zinc operations in Wisconsin and of copper operations in Tennessee has been fairly important. We have excluded such production whenever possible, since it is included in the value weight assigned to these other industries. Thus the first set of data for 1929, and data for all earlier years, exclude byproduct pyrites. The second set of figures for 1929, and data for all later years include such production. For 1902 and 1903 data on both output and price are from *The Mineral Industry, 1903,* summary table.

(22) Phosphate rock:

Quantity figures relate to production in all years except 1899. The 1899 figure relates to sales. Prices for all years are from quantity and value of sales. Production is measured on a mixed wet and dry basis prior to 1926, on a dry basis for 1926–39 (see A. Porter Haskell, Jr. and O. E. Kiessling, *Phosphate-Rock Mining,* National Research Project, Philadelphia, 1938, note c to Table A-8, p. 108).

(23) Potash:

Quantity data relate to the potash (K_2O) equivalent of potassium salts produced. Prices are derived from quantity and value of sales of potassium salts (potash equivalent). There was no production of potash salts prior to 1915; in that year quantity data are not available. Potash comes from several sources. In addition to production from natural brines and bedded saline deposits, recovery from distillery waste, cement flue and blast furnace dust, etc., has been made from time to time. In recent years production from natural brines and bedded saline deposits has accounted for over 98 percent of total output, but during World War I and the early post-war period production from other sources was important. We have excluded such secondary production whenever possible. Thus the first set of figures for 1919, and data for earlier years, relate only to natural brine potash. The second set of 1919 data, and figures for 1920 through the first set of 1924 include, in addition, potash from cement mill and blast furnace dust which could not be segregated. Again, the second set of data for 1924, and data for all later years, include potash from all sources.

(24) Fluorspar:

Data relate to production prior to 1906 and to shipments in 1906 and later years.

(25) Borates:

Data relate to sales in all years. Quantity data for 1899 and 1900 are from *The Mineral Industry, 1900* (Scientific Publishing Co., 1901), p. 2. Prices in 1901 and 1902 come from *The Mineral Industry, 1901* (The Engineering and Mining Journal, 1902), p. 2.

(26) Bromine:

Quantity data relate to sales in all years and comprise the quantity of bromine

recovered by producers from natural brines and the bromine content of compounds produced.

(27) Sodium carbonates and sulfates (natural):

Quantity data relate to sales of sodium carbonate and sulfate recovered from natural brines and saline deposits. No data are available for years before 1919: in that year sodium carbonates and sulfates are separated from sodium borate only in value terms, and the separation of quantities was therefore estimated.

(28) Magnesium chloride and sulfate:

Quantity data relate to sales of magnesium chloride and sulfate recovered from natural brines and saline deposits. No data are available for years before 1925. A slight discontinuity in the output series occurs between 1937 and 1938, because of the inclusion of brucite in 1938 and later years but not in 1937 and earlier years. Brucite was produced commercially as early as 1934 but production was very slight until 1938.

(29) Calcium chloride:

Quantity data relate to sales of calcium chloride and mixed calcium-magnesium chloride recovered from natural brines. Only since 1937 have quantity figures been expressed in a constant unit—75 percent $(Ca,Mg)Cl_2$—hence two sets of 1937 data are presented. The first figures for 1937 and data for earlier years are not expressed in this constant unit; the second 1937 figures and data for later years are so expressed.

(30) Silica and silicates (mainly for use as abrasives):

Quantity data relate to sales.

Some ground sand and sandstone is produced in the sand and gravel industry and is therefore already included in the statistics for that industry. However, the figures for ground sand and sandstone in the silica and abrasives chapters of *Minerals Yearbook* often include such production too. This is true of the data for the years 1923–32 and 1934–36. Quantity and value figures, excluding such production in these years, are available only for 1936 in the summary table to be found in the 1939 *Minerals Yearbook*. For the other years value figures alone, which exclude such production, are found in the annual summary tables. We have estimated quantities from these values, and from prices derived from quantity and value figures, including production in the sand and gravel industry. For years before 1913 data for ground sand and sandstone are not available, and figures for those years relate to quartz only: an overlap is provided in 1913.

Data for tripoli include Pennsylvania rottenstone. The first price shown for 1917, and prices for earlier years, relate to crude tripoli; the second 1917 price, and those for later years, refer to the product as sold, whether crude or finished.

(31) Abrasive sandstone:

Quantity data relate to sales and include grindstones, pulpstones, oilstones and related products. In 1917 the quantity of pulpstones is reported only as a number of pieces; this number we converted to short tons, using the 1918 ratio of short tons to pieces.

(32) Asphalt and related bitumens:

Quantity data apparently relate to sales of native asphalt and related bitumens. The figures are sometimes described as "production" and sometimes as "sales," but presumably the latter description is the more accurate (see, e.g., *Mineral Resources, 1930*, Vol. II, pp. 205-06).

(33) Talc:

Quantity data relate to sales, and include, in addition to talc, products with similar physical properties: pyrophyllite, a hydrous aluminum silicate, and (for certain

Footnotes to Table A-1 continued on next page.

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years) soapstone, both dimension and ground. Ground soapstone is included in 1933 and later years and excluded in earlier years; no overlap is possible. Dimension soapstone was included until 1924 and has been excluded since then; an overlap is provided.

(34) Barite:

Quantity data relate to sales in 1899–1926 and to production in 1927–39. Prices are derived from quantity and value of sales in all years.

(35) Magnesite:

Data relate to crude magnesite mined. However, since most of the output is first sold after processing (either dead-burned or caustic calcined) the crude value as reported is largely estimated. For 1938 and 1939 quantities were partly estimated by the Bureau of Mines. (The figures do not include brucite which appears in column 28 with other magnesium compounds.)

(36) Feldspar:

Quantity data relate to sales of crude feldspar. Prices refer to feldspar as sold, whether crude or finished, in 1899–1914, and to crude feldspar in 1915–39. The first 1915 price is comparable with earlier years and relates to feldspar as sold; the second 1915 price is comparable with later years and relates to crude feldspar.

(37) Mica:

Data relate to sales.

A. Uncut sheet and punch. In earlier years some mica miners operated cutting plants and the value of finished products was included in the production statistics. Since 1920, however, the figures relate to the uncut product only.

B. Scrap. Our figures do not include mica recovered from schist and kaolin operations. In 1922 and 1923 the published figures include mica from schist; the amount of such production was estimated by us (using ratios of schist to all scrap mica in 1921 and 1924) and excluded.

(38) Asbestos:

Quantity data relate to sales in 1899–1932 and to production in 1933–39. Prices are derived from quantity and value of sales in all years.

(39) Graphite:

Data relate to combined sales of crystalline and amorphous graphite, and are not available for years after 1929. In 1922 the price shown includes our estimate of the price of amorphous graphite (mean of 1921 and 1923) for which product the Bureau of Mines gives no value data.

TABLE A-2

VALUE OF MINERAL PRODUCTS

Thousand dollars

This table, based largely on Table A-1, shows the value, at the mine or beneficiating plant, not only of products included in our indexes of output, but of others for which quantity data were lacking. In the case of minor minerals not reported in Table A-1, values were taken from the summary tables in the U. S. Bureau of Mines publications Mineral Resources *and* Minerals Yearbook. *Where a different procedure was followed, the fact is indicated in footnotes.*

Industry	*1899*	*1909*	*1919*	*1929*	*1937*
METALS, TOTAL	189,057	328,699	539,200		
			540,956	627,216	641,577
Antimony[a]	44	5	0	0	138
Bauxite	117[b]	696[b]	2,202	2,266	2,445
Bismuth ore	9	0	0	0	0
Chromite	1	8	129	4	15
Iron ore[c]	34,646	110,425	213,601	190,388	207,352
Manganese[d]	435	236	3,349	4,887	4,920
Mercury	1,453	958	1,934	2,893	1,489
Molybdenum[e]	1	0	342	2,326	20,091
Nonferrous, major:[f]					
Copper		99,494	179,006	282,058	184,996
Gold, placer		10,237	9,300	3,772	21,052
Lead and zinc (Mississippi Valley)	152,348	24,271	43,782	53,865	38,172
Lode gold and silver, and lead and zinc (outside Mississippi Valley)		81,732	85,042	83,124	156,115
Platinum[g]	2	13	52	15	30
Titanium ore (rutile)	1	10	20	[h]	[h]
Tungsten	0	614	441	654	4,094
Unspecified[i]	[j]	[j]	1,756	964	668
NONMETALS, TOTAL	399,486	861,897			
		887,814	2,750,347		
			2,652,836	3,431,776	
				3,428,130	3,153,179
Asbestos	12	63	248	351	345
Asphalt and related bitumens	554	573	683	5,470	3,019
Barite[e]	140	210	1,728	1,842	2,272
Borates	505[k]	1,534	1,380	4,515	7,233
Bromine	108	58	1,235	1,759	5,180
Calcium chloride	[j]	63	322	2,097	1,295
Clay (incl. fuller's earth)	1,725	3,751	9,089	19,160	18,000
Coal:					
Bituminous	167,952	405,487	1,160,616	952,781	830,782[l]
Pennsylvania anthracite	88,142	149,182	364,927	385,643	197,599
Emery (excl. gems; incl. corundum)	151	18	23	11	3
Feldspar[m]	212	425	585		
			348	1,277	1,383
Fluorspar	97	292	3,526	2,791	3,667
Gems and precious stones	186	534	112	[h]	[h]
Graphite	167	346	779	311	[h]
Gypsum[n]	752	3,641	7,201	9,869	
				5,589	4,783
Magnesite	18	38	1,248	1,500	1,483
Magnesium chloride and sulfate	[j]	[j]	[o]	1,082	1,579

TABLE A-2—VALUE OF PRODUCTS (continued)

Industry	*1899*	*1909*	*1919*	*1929*	*1937*
Marl:					
Calcareous	30	45	327	131	60
Greensand			4[p]	256	211
Mica	101	281	542	404	490
Millstones	28	35	67	31	8
Mineral waters	6,948	6,894	4,880	[h]	[h]
Monazite and zircon	20	65	[h]	0	0
Peat	[i]	127	706	[h]	305
Petroleum and natural gas[q]	84,679	191,536	985,351		
			886,101	1,596,423	1,733,922
Phosphate rock[r]	5,084	11,287	9,446	13,245	13,976
Potash[s]	0	0	5,980	3,199	9,613
Pyrites[t]	543	1,028	2,558	616	
				1,250	1,778
Sand and gravel[u]	[v]	18,337	45,952		
			45,317	125,080	79,114
Silica and silicates (mainly for use as abrasives):					
Garnet	98	102	310	435	383
Pumice and pumicite	[i]	33	117	353	302
Ground sand and sandstone, and quartz[w]	219	249	374		
			662	1,473	2,063
Diatomite	37	122	532	[h]	[h]
Tripoli[x]			98		
			182	546	451
Abrasive silica stone products	893	1,018	1,572	1,454	686
Sodium carbonates and sulfates (natural)	[i]	[i]	608	1,958	1,791
Stone:[y]					
Basalt, nondimension		4,749	8,482		
			8,822	18,876	12,480
Basalt, dimension		385	463		
			123	70	28
Granite, nondimension		3,064	3,300		
			3,783	8,856	8,741
Granite, dimension		16,518	16,045		
			15,563	25,369	11,452
Limestone, nondimension (incl. limestone for lime)		22,975[z]			
	35,245[z]	26,600	47,333		
			55,017	100,380	93,117
Limestone, dimension		9,096	12,191		
			4,733	21,501	5,309
Marble, nondimension		6,549	258	534	321
Marble, dimension			7,784	16,011	5,135
Miscellaneous, nondimension		[aa]	1,878	7,753	8,950
Miscellaneous, dimension		[aa]	43	293	687
Sandstone, nondimension		1,213	1,433		
			2,680	5,737	5,795
Sandstone, dimension		6,797	3,851		
			2,604	5,287	1,721

TABLE A-2—VALUE OF PRODUCTS (concluded)

Industry	*1899*	*1909*	*1919*	*1929*	*1937*
Stone:[y] (cont.)					
Slate, nondimension	[l]	[l]	1,155	2,498	1,578
Slate, dimension	3,963	5,441	4,876	8,747	4,027
Limestone for cement	[l]	3,797	9,543	18,135	12,278
Sulfur	108	5,074	17,996	42,455	49,249
Talc[bb]	769	1,222	2,353		
			1,822	2,629	2,562
Unspecified[cc]	[l]	[l]	780	10,582	5,973
TOTAL METALS AND NONMETALS	588,543	1,190,596			
		1,216,513	3,289,547		
			3,193,792	4,058,992	
				4,055,346	3,794,756

[a] Data relate to antimony ore and concentrates only; separate figures for metal obtained as a byproduct of lead are lacking, but the value of such metal is included among the products of the major nonferrous metal industries.

[b] Available only in *Mineral Resources, 1918,* Vol. I, p. 516. This figure seems more accurate than those presented in later reports of the Bureau of Mines.

[c] For all years but 1899 the values are estimates derived by applying unit values for hematite, brown ore, magnetite and carbonate to their respective quantities (see Table A-1). For 1929 and 1937 unit values for carbonate are not available; therefore its value, which is negligible, is excluded. In 1919 there was no production of carbonate, and for 1899 and 1909 carbonate is included. The 1899 figure as presented in *Mineral Resources* is slightly larger than that shown here—the difference is attributable to the inclusion of manganiferous ores, which we have classified with manganese.

[d] For 1919 and earlier years the value of ores used for fluxing is included. No adjustment for comparability is made because no such ores were produced in 1929. Our 1899 figure is larger than that in *Mineral Resources* because we have included manganiferous ores classified by the Geological Survey with iron ore.

[e] 1929 and 1937 values are estimates, derived by applying unit values from sales to production figures. Data for other years are sales values.

[f] For a discussion of the industrial breakdown the reader is referred to Appendix B. The value data here presented are intended to relate to the value of the industry's products at the mine or ore dressing plant and, therefore, run lower than similar figures computed from Table A-1 (where market prices for refined metal are quoted); for the same reason they run lower than values to be found in *Minerals Yearbook* or its predecessor *Mineral Resources.* However, they include the value of byproducts (see Table B-1, below), in addition to the value of the primary products of each industry, quantity data for which are given in Table A-1. The figures for 1909, 1919 and 1929 are based on data in the Census of Mines and Quarries for those years. In most cases we adjusted the raw data in order to keep the table internally consistent or to maintain comparability from year to year. For example, we adjusted the Census figures to exclude such byproducts as are already included in the value figures for other commodities. It should be noted, in addition, that although in the 1909 Census the distinction between mining and manufacturing is not too carefully observed, we have abstracted from that volume figures which we consider comparable with the data for other years. There were no Census canvasses in the years 1899 and 1937. Hence, figures for these years are our estimates based on the relationship between mine and smelter or refinery values in 1902 and 1939 respectively, the two closest Census years.

[g] Estimated by applying derived price to production (excluding Alaska) in 1919, 1929 and 1937. For other years taken directly from *Mineral Resources.*

[h] Included under "unspecified."

Footnotes to Table A-2 continued on next page.

Footnotes to Table A-2, continued.

[i] Includes, in 1937, tantalum, titanium, uranium and vanadium. Does not include iron ore sold for magnets for which value cannot be secured (however, this is of infinitesimal importance).

Includes, in 1929, tantalum, titanium, uranium, vanadium. Does not include iron ore sold for magnets (see above).

Includes, in 1919, cobalt, tantalum (columbite), titanium (ilmenite), uranium and vanadium. Does not include iron ore sold for magnets (see above).

[j] Data not available.

[k] From *The Mineral Industry, 1900* (Scientific Publishing Co., 1901), p. 2.

[l] Estimated value, excluding sales costs; see note to Table A-1.

[m] The figures for 1899 and 1909, and the upper figure for 1919, refer to the value of feldspar as sold, whether crude or finished; the lower figure for 1919, and the figures for 1929 and 1937, refer to the value of the crude mineral.

[n] The figures for 1899, 1909 and 1919, and the upper figure for 1929, were derived by applying the *Minerals Yearbook* unit value for uncalcined gypsum to total production figures; the lower figure for 1929, and the figure for 1937, are mine values. The latter were derived for 1929 by applying a Census unit value for crude gypsum to the *Minerals Yearbook* quantity figure; and for 1937 from quantity and value data reported in *Minerals Yearbook*.

[o] Cannot be traced; probably included in "unspecified."

[p] Estimate based on relationship between calcareous and greensand marl in 1920.

[q] Figures for 1899 and 1909, and the upper figure for 1919, include the delivered value of natural gas; the lower figure for 1919, and the figures for 1929 and 1937, include the value of natural gas at the well (see Table A-1).

[r] For years other than 1899 the figures are estimates derived by applying sales unit values to production figures. The 1899 figure refers to value of sales.

[s] Estimates derived by applying sales unit values to production figures; the industry began in 1914.

[t] Figures for 1899, 1909 and 1919, and the upper figure for 1929, do not include the value of byproduct pyrites recovered from zinc mining in Wisconsin and copper mining in Tennessee; the lower figure for 1929, and the figure for 1937, include such byproduct recovery.

[u] The figure for 1909, and the upper figure for 1919, include the value of noncommercial production; the lower figure for 1919, and the figures for 1929 and 1937, exclude such output (exclusion in 1919 based on relationship in 1923).

[v] No canvass of the industry was undertaken in 1899. Sand crushed from sandstone and used in the manufacture of glass is included in the stone industry, but the value of the sand so included cannot be determined separately.

[w] Figures for 1899 and 1909, and the upper figure for 1919, refer to quartz only; the lower figure for 1919, and the figures for 1929 and 1937, include ground sand and sandstone as well.

[x] Figures for 1899 and 1909, and the upper figure for tripoli in 1919, relate to its value in crude form; the lower figure for 1919, and figures for 1929 and 1937, relate to its value as sold, whether crude or finished.

[y] The numerous overlaps shown for 1919 result from a change in the manner of reporting the products of the various divisions of the industry, some crushed stone being included with dimension stone in the upper figures comparable with 1909 (see Table A-1 and notes to that table).

[z] Excludes limestone for lime, for which data are lacking in 1899.

[aa] No separate value is available, miscellaneous varieties of stone having been reported in whatever categories they most closely resembled.

[bb] Figures for 1899 and 1909, and the upper figure for 1919, include the value of dimension soapstone; the lower figure for 1919, and the figures for 1929 and 1937, exclude its value. In 1929 dimension soapstone is included under "unspecified," and in 1937 with miscellaneous dimension stone.

[cc] Includes, in 1937, iodine, lithium minerals, vermiculite, chats, sulfur ore for agricultural purposes, natural sulfonated bitumen, flint lining for tube mills, op-

tical fluorspar, pebbles for grinding, gems and precious stones, graphite, mineral waters, diatomite and brucite.

Includes, in 1929, chats, flint lining for tube mills and pebbles for grinding, gem feldspar, micaceous minerals, diatomite, gems and precious stones, mineral waters, peat, optical fluorspar, lithium minerals and dimension soapstone.

Includes, in 1919, chats, flint lining for tube mills, lithium minerals, pebbles for grinding, chert and monazite.

TABLE A-3

EMPLOYMENT

A general note appears at the end of this table, followed by specific notes referring to individual industries or groups of industries.

Year	Total Mining, Including Oil and Gas Wells: Men (thous.)	Mandays (mil.)	Man-hours (mil.)	Total Mining, Excluding Oil and Gas Wells: Men (thous.)	Mandays (mil.)	Man-hours (mil.)	Metal Mining and Ore Dressing Total: Men (thous.)	Mandays (mil.)	Man-hours (mil.)
1899	..	..	..	..	..	..	..	..	..
1900	..	..	..	..	..	..	..	..	..
1901	..	..	..	..	..	..	..	..	..
1902	..	..	1,500	..	137.8	1,245	..	35.2	330
1903	..	..	..	..	..	..	..	..	..
1904	..	..	..	..	..	..	..	..	..
1905	..	..	..	..	..	..	..	..	..
1906	..	..	..	..	..	..	..	..	..
1907	..	..	..	..	..	..	..	..	..
1908	..	..	..	..	..	..	..	..	..
1909	..	..	..	..	..	..	..	..	..
1910	..	..	..	..	..	..	..	..	..
1911	..	..	..	..	205.5 226.1	..	..	..	..
1912	..	..	..	..	232.4	..	..	..	..
1913	..	..	..	..	253.8	..	183.3	54.1	..
1914	..	..	..	..	217.8	..	152.7	42.4	..
1915	..	..	..	..	215.7	..	152.2	44.0	..
1916	..	..	..	..	247.2	..	209.3	60.82	..
1917	..	..	..	..	267.3	..	208.0	61.01	..
1918	..	..	..	..	266.6	..	189.2	57.22	..
1919	..	..	..	..	219.2 220.3	1,674 1,818	147.7	42.10	361.1
1920	..	..	..	..	241.0	..	138.9	41.59	..
1921	..	..	..	..	178.2	..	89.0	21.31	..
1922	..	..	..	..	166.9	..	104.7	29.36	..
1923	..	..	..	..	226.3	..	125.4	37.72	..
1924	..	..	..	..	208.2	..	126.0	37.48	..
1925	..	..	..	..	200.4	..	129.3	38.73	..
1926	..	..	..	..	223.3	..	129.9	38.85	..
1927	..	..	..	..	202.6	..	121.0	35.43	..
1928	..	..	..	..	189.4	..	112.1	33.23	..
1929	1,022	..	2,047	.. 843	195.1 198.8	1,599 1,634	120.1	35.98	298.4
1930	..	..	..	811	168.6	..	102.7	28.31	..
1931	..	..	..	733	129.2	1,057	78.2	18.58	154.0
1932	..	..	..	627	97.9	797	48.8	10.30	84.9
1933	..	..	..	625	107.6	867	51.6	10.40	83.7
1934	..	..	..	678	127.0	952	61.7	13.69	109.6
1935	841	..	1,203	702	131.3	967	84.1	19.59	155.7
1936	884	..	1,410	729	151.1	1,118	95.0	24.76	198.9
1937	933	..	1,472	765	156.8	1,148	115.2	30.42	243.1
1938	..	..	1,207	..	121.2	884	96.1	22.85	182.6
1939	847	..	1,240	694	132.8	967	102.6	25.68	203.9

TABLE A-3—EMPLOYMENT (continued)

Year	Metal Mining and Ore Dressing (continued)								
	Iron Ore			Copper			Other Nonferrous Metals		
	Men (thous.)	*Mandays* (mil.)	*Man-hours* (mil.)	*Men* (thous.)	*Mandays* (mil.)	*Man-hours* (mil.)	*Men* (thous.)	*Mandays* (mil.)	*Man-hours* (mil.)
1899	..	..	..	..	..	..	..	..	..
1900	..	..	..	..	..	..	..	..	..
1901	..	..	..	..	..	..	..	..	..
1902	46.2	12.0	119	..	8.4	75	..	14.8	136
1903	..	..	..	..	..	..	..	..	..
1904	..	..	..	..	..	..	..	..	..
1905	..	..	..	..	..	..	..	..	..
1906	..	..	..	..	..	..	..	..	..
1907	..	..	..	..	..	..	..	..	..
1908	..	..	..	..	..	..	..	..	..
1909	..	..	..	..	..	..	..	..	..
1910	..	..	..	..	..	..	..	..	..
1911	..	..	..	..	..	..	..	..	..
1912	..	..	..	..	..	..	..	..	..
1913	..	..	..	..	..	..	..	..	..
1914	..	..	..	..	..	..	..	..	..
1915	43.4	11.81	105.5	54.5	16.6	..	..	..	..
1916	57.0	15.64	140.8	70.5	22.06	..	81.7	23.12	..
1917	60.6	16.97	153.6	72.6	22.85	..	74.8	21.20	..
1918	55.7	16.30	148.6	69.2	22.31	..	64.4	18.61	..
1919	51.8	14.48	131.1	44.7	13.72	115.3	51.2	13.90	114.8
1920	50.6	14.54	133.5	41.4	13.28	..	46.9	13.77	..
1921	32.3	6.75	61.1	20.9	4.88	..	35.8	9.68	..
1922	35.8	8.95	79.4	30.6	8.90	..	38.3	11.51	..
1923	41.3	11.80	107.6	38.0	12.19	..	46.1	13.73	..
1924	38.8	10.20	91.3	39.2	12.60	..	48.1	14.68	..
1925	35.8	9.67	86.3	39.8	12.74	..	53.7	16.32	..
1926	34.4	9.40	84.2	40.5	13.23	..	55.0	16.22	..
1927	34.8	9.18	82.0	37.3	11.91	..	48.9	14.34	..
1928	30.2	8.01	71.4	37.5	12.39	..	44.3	12.83	..
1929	30.8	8.64	77.1	44.6	14.56	118.9	44.8	12.78	102.3
1930	31.0	8.04	71.6	33.8	10.21	..	37.9	10.06	80.8
1931	22.9	4.60	40.9	24.8	6.54	53.1	30.4	7.44	60.0
1932	12.6	1.83	16.4	12.7	2.95	24.0	23.5	5.53	44.5
1933	15.1	2.12	17.9	9.0	2.14	17.0	27.5	6.14	48.8
1934	16.5	3.19	25.5	10.3	2.40	19.2	34.8	8.10	65.0
1935	15.0	3.28	26.3	13.1	3.64	29.1	56.0	12.68	100.4
1936	20.3	4.62	37.2	17.7	5.55	44.5	57.0	14.59	117.2
1937	25.9	6.40	51.4	27.0	8.40	67.2	62.3	15.62	124.5
1938	19.8	3.81	30.6	21.6	5.56	44.4	54.7	13.48	107.6
1939	21.9	4.86	39.1	23.2	6.77	54.1	57.5	14.06	110.8

TABLE A-3—EMPLOYMENT (continued)

Year	Pennsylvania Anthracite			Bituminous Coal			Oil and Gas Wells		
	Men (thous.)	*Mandays* (mil.)	*Man-hours* (mil.)	*Men* (thous.)	*Mandays* (mil.)	*Man-hours* (mil.)	*Men* (thous.)	*Mandays* (mil.)	*Man-hours* (mil.)
1899	139.6	24.15	..	271.0	63.42	..	..	..	..
1900	144.2	23.94	..	304.4	71.22	..	..	..	..
1901	145.3	28.48	270.6	340.2	76.55	..	..	..	..
1902	148.1	17.18	163.2	370.1	85.11	749.0	32.3	..	118.8
1903	150.5	31.00	279.0	415.8	93.55	813.9	..	..	..
1904	155.9	31.17	280.5	437.8	88.44	760.6	..	..	..
1905	165.4	35.56	320.1	460.6	97.19	835.9	..	..	..
1906	162.4	31.66	284.9	478.4	101.90	876.4	..	..	..
1907	167.2	36.79	331.1	513.3	120.10	1032.9	..	..	..
1908	174.2	34.84	313.5	516.3	99.64	856.9	..	..	..
1909	173.5	35.57	320.1	543.2	113.52	976.3	..	..	..
1910	169.5	38.82	349.3	555.5	120.55	1036.7	..	..	..
1911	172.6	42.46	382.1	549.8	116.00	997.6	..	..	..
1912	174.0	40.20	361.8	548.6	122.34	1052.2	..	..	..
1913	175.7	45.17	406.5	571.9	132.68	1141.0	..	..	..
1914	179.7	44.02	396.2	583.5	113.78	978.5	..	..	..
1915	176.6	40.56	365.0	557.5	112.92	971.1	..	..	..
1916	159.9	40.47	344.0	561.0	129.24	1111.5	..	..	..
1917	154.2	43.90	351.2	603.1	146.50	1215.9	..	..	..
1918	147.1	43.14	345.2	615.1	153.29	1244.7	..	..	..
1919	154.6	41.08	328.6	621.8	121.54	979.6	..	..	..
1920	145.1	39.36	314.9	639.3	140.98	1133.5	..	..	..
1921	159.5	43.15	345.2	663.4	99.11	796.9	..	..	..
1922	156.8	23.64	189.1	687.5	97.82	788.4	..	..	..
1923	157.7	42.20	337.6	704.6	125.95	1015.1	..	..	..
1924	160.0	43.90	351.2	619.4	106.02	856.6	..	..	..
1925	160.3	29.11	232.9	588.3	114.92	928.6	..	..	..
1926	165.4	40.31	322.5	593.5	127.49	1028.8	..	..	..
1927	165.3	37.21	297.7	593.8	113.67	918.5	..	..	..
1928	160.7	34.79	278.3	522.0	105.78	854.7	..	..	..
1929	151.5	34.10	272.8	502.8	110.34	891.6	179.0	..	413.3
1930	150.8	31.57	252.5	493.1	92.30	749.9	..	..	..
1931	139.4	25.92	208.4	450.1	72.06	585.5	..	..	..
1932	121.2	19.49	156.9	406.3	59.36	480.3	..	..	..
1933	104.6	19.04	152.3	418.6	69.84	564.1	..	..	..
1934	109.0	22.57	180.6	457.9	81.70	591.4	..	..	..
1935	103.3	19.49	155.7	462.3	82.78	581.9	139.6	..	236.3
1936	102.1	19.59	156.1	477.1	95.05	668.4	155.0	..	291.3
1937	99.1	18.74	135.9	491.7	94.99	667.5	167.2	..	323.4
1938	96.4	16.53	115.9	441.2	71.30	502.1	163.4	..	323.4
1939	93.1	17.04	119.8	445.0	78.94	554.8	153.6	..	273.2

TABLE A-3—EMPLOYMENT (continued)

Year	Stone Quarrying								
	Total			Dimension Stone			Nondimension Stone		
	Men (thous.)	Mandays (mil.)	Man-hours (mil.)	Men (thous.)	Mandays (mil.)	Man-hours (mil.)	Men (thous.)	Mandays (mil.)	Man-hours (mil.)
1899	..	..	..	..	..	..	..	..	..
1900	..	..	..	..	..	..	..	..	..
1901	..	..	..	..	..	..	..	..	..
1902	..	..	..	..	..	..	..	..	..
1903	..	..	..	..	..	..	..	..	..
1904	..	..	..	..	..	..	..	..	..
1905	..	..	..	..	..	..	..	..	..
1906	..	..	..	..	..	..	..	..	..
1907	..	..	..	..	..	..	..	..	..
1908	..	..	..	..	..	..	..	..	..
1909	..	..	..	..	..	..	..	..	..
1910	..	..	..	..	..	..	..	..	..
1911	..	20.67	..	..	..	..	..	..	..
1912	..	21.72	..	..	..	..	..	..	..
1913	..	21.36	..	..	..	..	..	..	..
1914	..	17.24	..	..	..	..	..	..	..
1915	..	17.88	..	..	..	..	..	..	..
1916	..	16.23	..	..	..	..	..	..	..
1917	..	15.44	..	..	..	..	..	..	..
1918	..	12.62	..	..	..	..	..	..	..
1919	..	14.06	132.9	..	..	..	..	..	..
1920	..	16.50	..	..	..	..	..	..	..
1921	..	13.04	..	..	..	..	..	..	..
1922	..	14.60	..	..	3.70	..	..	10.90	..
1923	..	18.88	..	..	4.58	..	..	14.29	..
1924	..	19.02	..	..	5.33	..	..	13.69	..
1925	..	15.83	..	..	4.22	..	..	11.61	..
1926	..	14.96	..	..	3.85	..	..	11.12	..
1927	..	14.65	..	..	3.64	..	..	11.01	..
1928	..	14.03	..	..	3.61	..	..	10.41	..
1929	{ .. / 63.1	13.23 / 16.93	122.5 / 157.0	..	3.36	30.2	..	{ 9.87 / 13.57	92.2 / 126.8
1930	59.6	15.14	137.6	..	2.88	25.6	..	12.27	112.0
1931	60.8	11.80	100.9	..	1.93	16.4	..	9.87	84.5
1932	47.7	8.26	70.1	..	1.15	9.53	..	7.11	60.5
1933	46.4	7.66	61.0	..	1.05	8.30	..	6.61	52.7
1934	45.2	8.16	62.5	..	.873	6.43	..	7.28	56.1
1935	47.9	8.45	65.3	..	1.06	8.14	..	7.39	57.2
1936	50.3	10.58	84.9	..	1.46	11.6	..	9.12	73.3
1937	54.5	11.37	91.2	..	1.64	13.3	..	9.73	77.9
1938	47.6	9.44	74.5	..	1.41	11.3	..	8.03	63.2
1939	48.3	10.04	79.0	..	1.56	12.4	..	8.49	66.6

TABLE A-3—EMPLOYMENT (concluded)

Year	Gypsum Mining			Phosphate Rock Mining		
	Men (thous.)	*Mandays* (mil.)	*Manhours* (mil.)	*Men* (thous.)	*Mandays* (mil.)	*Manhours* (mil.)
1899	..	..	..	..	..	..
1900	..	..	..	..	..	..
1901	..	..	..	..	..	..
1902	..	.247	2.47	..	1.85	19.0
1903	..	..	..	..	..	..
1904	..	..	..	..	..	..
1905	..	..	..	..	..	..
1906	..	..	..	..	..	..
1907	..	..	..	..	..	..
1908	..	..	..	..	..	..
1909	..	..	..	..	..	..
1910	..	..	..	..	..	..
1911	1.70	.418	4.03	..	..	..
1912	..	.438	4.21	..	..	..
1913	..	.443	4.25	..	..	..
1914	..	.411	3.94	..	..	..
1915	..	.396	3.79	..	..	..
1916	1.57	.435	4.16	..	..	..
1917	..	.442	4.25	..	..	..
1918	..	.350	3.39	..	..	..
1919	1.55	.429	4.18	5.79	1.12	11.3
1920	1.77	.510	4.90	7.05	2.06	20.9
1921	1.72	.443	4.30	5.54	1.18	11.9
1922	1.98	.573	5.60	3.79	.899	9.15
1923	2.33	.675	6.60	3.53	.926	9.39
1924	2.59	.730	7.12	3.78	1.06	10.6
1925	2.93	.829	7.41	3.59	.999	9.99
1926	2.75	.782	6.81	3.33	.951	9.66
1927	2.59	.686	5.91	3.04	.906	9.20
1928	2.28	.613	5.31	3.24	.909	9.32
1929	2.04	.521	4.61	3.22	.938	9.62
1930	1.44	.326	2.78	3.28	.937	9.73
1931	1.37	.272	2.30	2.67	.614	6.06
1932	1.02	.140	1.12	1.90	.380	3.64
1933	1.00	.149	1.18	2.30	.516	4.70
1934	1.06	.186	1.42	2.91	.694	5.99
1935	.992	.196	1.56	3.10	.757	6.64
1936	1.22	.280	2.21	3.23	.883	7.84
1937	1.31	.297	2.37	3.48	.956	8.27
1938	1.11	.242	1.92	..	.835	6.97
1939	1.24	.312	2.47	3.31	.827	6.68

General Note to Table A-3

For the most part the employment data shown in this table are derived for 1902 from the Census, and for other years from the accident statistics collected by the U. S. Bureau of Mines. Our chief concern is their comparability with output. In 1902 both output and employment are effectively derived from the same (Census) canvass, and therefore tend to have the same coverage. Even so, various adjustments all of which are described in the following notes, had to be made for 1902. For more recent years it will be seen that we use employment data collected quite independently of the reporting of output; these were gathered primarily in order to measure accident rates. Since employment and accidents are measured in the same canvass, complete coverage is not of first importance when the aim is to compute accident frequencies. For our purposes, however, the coverage of the accident employment data is obviously of vital significance. Our output data are practically complete; and our employment data must be equally comprehensive if accurate indexes of productivity are to result. With certain exceptions (which are noted) the coverage of these data appears to be satisfactory, by comparison with Census figures for employment and by other tests. In a few cases of patent undercoverage we have ventured to make adjustments.

Figures for men employed as collected by the Bureau of Mines are "active period averages," i.e., averages of monthly counts confined to the months in which the enterprise was active; or exceptionally, in recent years, they may represent an actual number of mandays taken from payroll records, divided by the number of days during the year that the mine operated. The latter is of course the superior method of measurement. Figures for mandays usually consist of the active period average number of employees reported, multiplied by the average number of days the mine was active (the computation is carried out separately for each enterprise by the Bureau of Mines); exceptionally, for recent years, they may include actual payroll records of mandays worked. Practically throughout, figures for manhours represent mandays multiplied by nominal hours worked per day (the computation is carried out, except where otherwise noted, by the Bureau of Mines for individual establishments), rather than a summation of hours recorded in payrolls. For further discussion of these measures, see pp. 272-75 above and Chapter 3 of the text.

In the special case of oil and gas wells, accident data on employment do not exist, and we depend almost entirely upon the few Census canvasses of the industry that have been made. The data differ from those for other industries also in covering wage earners only, instead of all persons subject to accident hazard; further, they are confined to average number of men and manhours worked. See notes below.

Metal Mining and Ore Dressing, Total

The metal mining industries have been defined to include not only the actual mining of metallic ores, but also subsequent ore dressing operations preliminary to smelting and refining.

Because of peculiarities in the data, employment totals for the group include certain nonmetals and exclude one metal mining industry. The excluded industry is placer gold mining. We have chosen not to include it in our indexes of employment and productivity because employment data are inadequate by reason of the prevalence of extremely small scale and migratory operations. Since there is no way of determining how the coverage of the industry has varied over time, it seemed best to exclude it.[1] The nonmetals included are fluorspar operations in Illinois and Kentucky, and pyrites. The former is included in the Bureau of Mines statistics of lead and zinc operations in Illinois and Kentucky because the products are often jointly produced, and because accident hazards in mines producing lead and zinc are similar to those in mines producing fluorspar. Pyrites has been included in the

[1] However, employment data for placer mining are included in the statistics of Chapter 3. See also Census reports; and Charles W. Merrill, Charles W. Henderson and O. E. Kiessling, *Small-Scale Placer Mines as a Source of Gold, Employment and Livelihood in 1935* (National Research Project, Philadelphia, 1937).

Footnotes to Table A-3 continued on next page.

Footnotes to Table A-3, continued.
Bureau of Mines statistics for miscellaneous metal mining because the cinder is used in some metallurgical works for its iron and copper content. Neither pyrites nor fluorspar can be excluded from the total without resort to rather rough estimates; since these products are very unimportant we have made no attempt to derive employment estimates which exclude them, but have preferred instead to include them in our output indexes.

For all years for which figures are given except 1902, the source for employment in mining (as distinct from milling or beneficiating) is the U. S. Bureau of Mines annual publication, "Metal-Mine Accidents in the United States." We have adjusted the published totals to exclude employment in Alaska and in placer mining. Figures for Alaska (including placer employment) are published separately and have been subtracted. For 1912–16 and 1924–39 placer employment (including Alaska) also is given separately and may be subtracted. (In so doing we deduct figures for placers in Alaska twice over, and as we wish to do this only once, the amount concerned must be added back. For most of these years unpublished data on persons employed at placers in Alaska were supplied to us in a special tabulation by Mr. W. W. Adams of the U. S. Bureau of Mines.) For 1911 and 1917–23 we estimated the number of placer miners to be excluded on the basis of gold production from placers in these years.

Except for 1902, employment at milling and ore dressing establishments is derived from the series of annual reports by the U. S. Bureau of Mines entitled "Accidents at Metallurgical Works in the United States." For metal mining as a whole these are available back to 1913, though separate figures for copper, for example, date from 1915. We have subtracted Alaska from the totals. The chief defect of these data is that employment at auxiliary works connected with mills (which we wish to include) is not separated from employment at such works attached to smelters (which we wish to exclude).[2] A single series covers both, because auxiliary works sometimes serve both mills and smelters. It is therefore difficult to secure a figure for the number of mandays or manhours associated with the one or with the other separately. We have attempted to estimate the amount of employment at such works which should be included with that at mills. These estimates were based on figures for recent years kindly furnished by Mr. W. W. Adams. In his letter to us Mr. Adams explained that the Bureau of Mines received separate figures for mill and smelter auxiliary works in most instances, but that some large operators reported a combined figure. The figures he forwarded to us gave the distribution of auxiliary works reported separately for mills and smelters. On the basis of this partial distribution of auxiliary employment, we derived a figure for all auxiliary employment associated with milling in 1935–39. For earlier years we extrapolated the ratio of mill auxiliary employment to total auxiliary employment derived from these data. Such estimates were carried through in terms of mandays, and active period averages for men employed were then adjusted on the basis of the manday relationships. The calculation for mandays—our basic measure—is shown in Worksheets I and II. For 1911 and 1912 employment at mills is not available; for these years the manday index for metal mining and milling in Table A-5 was derived by extrapolating the 1913 figure, with the use of employment data relating to mines only (Worksheet II, column 1).

[2] Auxiliary works are described, not very specifically, as "yards, shops, construction, etc., in connection with mills and smelters." Their nature is further suggested by the statement that ladders, scaffolds, railway cars and hand tools are causes of accidents. Probably they are concerned chiefly with maintenance or development work. (See e.g., U. S. Bureau of Mines, *Technical Paper 395*, "Accidents at Metallurgical Works, 1924," pp. 7–8.)

Worksheet I

Derivation of Mandays at Mills and Auxiliary Works Attached to Them, Metal Mining, 1916–39[a]

Thousand mandays, except columns (3) and (6).

Year	(1) Mills[b]	(2) All Auxiliary Works[b]	(3) Ratio of Mandays at Mill Auxiliary Works to Mandays at All Auxiliary Works[c]	(4) Auxiliary Works Attached to Mills[d]	(5) Mills and Auxiliary Works Attached to Them[e]	(6) Ratio of Mandays at Mills and Auxiliary Works Attached to Them to Mandays at Mills Only[f]
1916	7,041	4,729	..	1,366	8,407	1.1940
1917	7,311	5,104	..	1,475	8,786	1.2018
1918	6,755	6,033	..	1,743	8,498	1.2580
1919	5,059	4,852	..	1,402	6,461	1.2771
1920	5,044	5,509	..	1,592	6,636	1.3156
1921	2,411	2,493	..	720	3,131	1.2986
1922	3,315	4,221	..	1,219	4,534	1.3677
1923	4,435	5,412	..	1,564	5,999	1.3526
1924	4,828	5,287	..	1,528	6,356	1.3165
1925	5,125	5,844	..	1,688	6,813	1.3294
1926	5,215	5,776	..	1,669	6,884	1.3200
1927	4,693	5,386	..	1,556	6,249	1.3316
1928	3,707	4,800	..	1,387	5,094	1.3742
1929	4,280	5,130	..	1,482	5,762	1.3463
1930	3,339	3,971	..	1,147	4,486	1.3435
1931	2,310	2,554	..	738	3,048	1.3195
1932	1,274	1,809	..	523	1,797	1.4105
1933	1,311	1,787	..	516	1,827	1.3936
1934	1,746	2,195	..	634	2,380	1.3631
1935	2,817	3,062	.28892	885	3,702	1.3142
1936	3,414	3,823	.29851	1,141	4,555	1.3342
1937	4,031	4,886	.31056	1,517	5,548	1.3763
1938	2,956	3,892	.33337	1,297	4,253	1.4388
1939	3,453	4,029	.34543	1,392	4,845	1.4031

[a] Data for mills include Alaska; there were apparently no auxiliary works in Alaska.

[b] U. S. Bureau of Mines annual publication, "Accidents at Metallurgical Works," and bulletins on "Health and Safety Statistics."

[c] Ratios based on a breakdown of mandays at auxiliary works between mills and smelters supplied by Mr. W. W. Adams of the Bureau of Mines. This breakdown has a coverage (in manday terms) of all auxiliary works as follows: 1935, 98 percent; 1936, 88 percent; 1937, 86 percent; 1938 and 1939, 87 percent.

[d] For 1916–35, column (2) × .28892; 1936–39, columns (2) × (3). The alternative to this use of a constant (1935) ratio for 1935 and all earlier years is to make the segregation depend upon mandays at mills and smelters respectively (see Vivian E. Spencer, *Mineral Extractive Industries*, National Research Project, Philadelphia, 1940, p. 124). However, corresponding ratios obtained in this fashion run much higher (e.g., .40454 for 1935) than those available for recent years from the sample data quoted, and would appear to lead to the overestimation of the employment we wish to include.

[e] (1) + (4).

[f] (5) ÷ (1). This ratio is used in Worksheet IV below.

Footnotes to Table A-3 continued on next page.

Footnotes to Table A-3, continued.

Worksheet II

Derivation of Mandays at Mines and Mills, Including Auxiliary Works Attached to Mills, Metal Mining, 1913–39

Thousand mandays

Year	(1) *Mines Only*[a]	(2) *Mills, including Alaska*[b]	(3) *Mills, Alaska*[c]	(4) *Mills, excluding Alaska*[d]	(5) *Mines and Mills*[e]
1911	42,406	..	..	..	..
1912	43,397	..	..	..	..
1913	49,298	..	..	4,846[f]	54,144
1914	37,860	..	76	4,491[f]	42,351
1915	38,388	..	159	5,573[f]	43,961
1916	52,742	8,407	333	8,074	60,816
1917	52,367	8,786	140	8,647	61,014
1918	48,837	8,498	112	8,386	57,223
1919	35,771	6,461	134	6,327	42,098
1920	35,120	6,636	167	6,469	41,589
1921	18,355	3,131	176	2,955	21,310
1922	24,924	4,534	94	4,441	29,365
1923	31,879	5,999	163	5,836	37,715
1924	31,219	6,356	93	6,263	37,482
1925	32,070	6,813	154	6,658	38,728
1926	32,131	6,884	163	6,721	38,852
1927	29,329	6,249	150	6,099	35,428
1928	28,277	5,094	137	4,957	33,234
1929	30,356	5,762	141	5,621	35,977
1930	23,953	4,486	133	4,354	28,307
1931	15,646	3,048	112	2,936	18,582
1932	8,611	1,797	105	1,692	10,303
1933	8,652	1,827	79	1,748	10,400
1934	11,390	2,380	78	2,301	13,691
1935	15,981	3,702	91	3,611	19,592
1936	20,325	4,555	119	4,436	24,761
1937	24,999	5,548	124	5,424	30,423
1938	18,730	4,253	133	4,120	22,850
1939	20,943	4,845	105	4,741	25,684

[a] U. S. Bureau of Mines, "Metal-Mine Accidents in the United States." Totals have been adjusted, as described in accompanying notes, to exclude employment in Alaska and at placer mines.

[b] Worksheet I, column (5). Data include estimated employment at auxiliary works attached to mills.

[c] U. S. Bureau of Mines, "Accidents at Metallurgical Works" and bulletins on "Health and Safety Statistics." There are apparently no auxiliary works in Alaska.

[d] (2) — (3).

[e] (1) + (4).

[f] U. S. Bureau of Mines, "Accidents at Metallurgical Works" and bulletins on "Health and Safety Statistics." Auxiliary works appear to have been included in the published figures for mills in these years, but coverage may not have been complete.

Data on manhours in metal mining are shown for all the years for which reasonably good figures can be obtained. Their reliability is compromised chiefly by the fact that figures for hours per day (used to convert mandays to manhours) usually relate to nominal rather than actual hours worked. For 1931–39 manhours in mining (as distinguished from milling) are taken directly from "Metal-Mine Accidents in the United States." For the same period manhours at mills (excluding auxiliaries) were taken directly from "Accidents at Metallurgical Works" and "Health and Safety Statistics." Manhours at auxiliaries attached to mills were estimated separately as follows: mandays at auxiliaries attached to mills (Worksheet I, column 4) were multiplied by average hours per day at all auxiliaries, the source being the same as for mill employment. For 1929 we derived manhours in mining by summing data for iron ore, copper, and other nonferrous metals (see below); and we obtained manhours in milling (including auxiliaries) by multiplying mandays (Worksheet II, column 4) by hours per shift at all mills, derived from "Accidents at Metallurgical Works, 1929." For 1919 manhours in mining and milling (including auxiliary works) are the sum of the data for iron ore, copper and other nonferrous metals (see below).

For 1902 the basic source is the Census (*Special Reports,* "Mines and Quarries, 1902"). The data for average employment of wage earners found in that volume are not comparable with our figures for later years for two reasons. (1) The latter figures, based on accident reports, are intended to cover all persons subject to mine hazards, and to exclude clerical workers and others not so subject. It seems probable that this concept is slightly more inclusive than the "wage earners" of Census reports. Accordingly, in deriving figures for 1902 from the Census of that year, we have included the salaried category *Superintendents, managers, foremen, surveyors*; but we have excluded the salaried categories *General officers* and *Clerks*. (2) Our data for men, based on Bureau of Mines statistics for all years except 1902, are "active period averages," i.e., averages of monthly counts confined to the months in which the enterprise was active. The 1902 Census figures for wage earners, on the other hand, are full year averages derived in a rather unusual manner. Where an enterprise worked fewer than 300 days, say 253, the number of wage earners reported was multiplied by 253/300 in the course of editing the schedules, to yield an indicated number of 300-day wage earners. Where an enterprise worked more than 300 days in 1902 the Census refrained from making such an adjustment. (See "Mines and Quarries, 1902," pp. 1122-23.) Totals for each industry in this Census therefore represent a combination of averages for individual establishments, partly as originally reported, partly as adjusted by the Census personnel. Since there is no way of unscrambling the result, active period average employment cannot be derived for 1902. Mandays and manhours were estimated as follows: First, we estimated true 300-day averages for each industry. That is, in industries in which some firms reported more than 300 days' operation we made a slight upward adjustment of the wage earner total: if one fifth of the firms worked 315 days (i.e., were reported in the group 300-330 days; "Mines and Quarries, 1902," p. 109), and the remainder 300 days or fewer, the wage earner average was multiplied by 303/300. (Note: $300 \times 4 + 315 = 1{,}515$; $1{,}515 \div 5 = 303$ days active implicit in Census average.) This estimate of the true number of wage earners was multiplied by 300 to yield the number of wage earner mandays. The number of superintendents, etc. (see above) was then multiplied by the average number of days all firms in the industry were active to yield the salary earner mandays which we have to include. The two sets of mandays (wage and salary) were then added together. Mandays were converted into manhours with the help of the distribution of firms by nominal hours per shift ("Mines and Quarries, 1902," p. 110). These calculations were performed separately for each metal mining industry distinguished by the Census, and are indicated in Worksheet III.

Footnotes to Table A-3 continued on next page.

Worksheet III

Derivation of Employment Estimates For Metal Mining and Ore Dressing, 1902

Industry	(1) *Wage Earners (Census Average)*[c]	(2) *Days Active Implicit in Census Average*[d]	(3) *Superintendents, Managers, Surveyors, Foremen*[e]	(4) *Days Mine Was Active*[d]	(5) *Total Mandays*[f] (thous.)	(6) *Estimated Hours per Shift*[g]	(7) *Total Manhours*[h] (thous.)
Iron ore	38,851	300	1,628	260[i]	12,008[j]	9.9	118,879
Copper	26,007	315	737	250	8,376	8.95	74,965
Lead and zinc	9,067[k]	300	729	185	2,855	8.9	25,410
Gold and silver[a]	34,041[l]	310	2,436[m]	200	11,040	9.2	101,568
Mercury	1,329	323	74	288	450	9.5	4,275
Bauxite	150	300	32	259	53	10	530
Pyrites[b]	970	306	38	261	307	9.8	3,009
Manganese	194	300	16	138	130[n]	10	1,300
TOTAL					35,219		329,936

[a] Deep mines only.

[b] Includes sulfur from which it cannot be separated; however, production of sulfur was unimportant in 1902.

[c] *Special Reports,* "Mines and Quarries, 1902," p. 93.

[d] *Ibid.,* p. 109. Days were weighted by number of mines.

[e] *Ibid.,* see individual chapters.

[f] (1) × (2) + (3) × (4).

[g] "Mines and Quarries, 1902," p. 110. Hours per shift were weighted by number of mines.

[h] (5) × (6).

[i] N. Yaworski and others, *Iron Mining* (National Research Project, Philadelphia, 1940), p. 215, footnote h.

[j] The indicated amount is 12,078 thousand mandays. However the Census industry produced 35,554 thousand long tons of which only 35,347 thousand long tons were true iron ore, the remainder being manganiferous ore included by us under manganese. A proportionate adjustment reduces employment to 12,008 thousand mandays as shown.

[k] The 6,835 wage earners reported for Kansas and Missouri were increased to 8,021 for undercoverage: ratio based on value of products. See "Mines and Quarries, 1902," pp. 19-20, 446, 463-65; *Thirteenth Census,* "Mines and Quarries, 1909," p. 15.

[l] The 33,821 wage earners reported for the industry were increased to 34,041 to allow for undercoverage: ratio based on value of products. See "Mines and Quarries, 1902," pp. 510, 512.

[m] Of 1,725 superintendents, etc., in gold and silver mines ("Mines and Quarries, 1902," p. 578) 1,586 were allocated to deep mines on the basis of the ratio for "other salaried employees" (p. 512); to these were added 850 foremen working below ground.

[n] Includes 70 thousand mandays in the mining of manganiferous iron ore: see note j.

Iron Ore Mining and Beneficiating

Employment totals, which include both mining and milling (or beneficiating), are available for all years since 1915, and our figures for these years are therefore directly transcribed from other sources. For the years 1923–39 the data are from the iron chapters in recent issues of *Minerals Yearbook*, especially the 1937 *Yearbook*, p. 600. The data for these years are also to be found in the National Research Project report on the industry prepared by N. Yaworski and others (*Iron Mining*, Philadelphia, 1940). In addition, this report presents comparable data for the period 1915–22. According to a letter from Mr. Yaworski, now with the Bureau of the Census, the NRP data for 1915–22 were compiled from the original reports submitted by companies to the Bureau of Mines. He states that the data for 1915–22 are fully comparable with those for later years. For practically all years the employment totals are estimates based on a coverage close to 100 percent. In addition, manhours were estimated for some of the mines in all years. (See *Iron Mining*, Table A-6, pp. 218, 225.)

For 1902, data were derived by the method described above in the note on "Metal mining" (see Worksheet III).

For 1911–14, data on employment at mills are not available. For these years the manday index in Table A-5 was derived by extrapolation of the 1915 index with the use of employment data relating to mines only. The figures, taken from "Metal-Mine Accidents in the United States," are:

	Men (thous.)	*Mandays* (mil.)
1911	46.0	12.75
1912	45.7	13.04
1913	51.1	15.06
1914	44.8	11.75
1915	39.4	10.71

Copper Mining and Milling

As with other metal mining industries, the nonmanufacturing activities of the copper industry include ore dressing (or milling) as well as mining. For 1902 the derivation of the data has already been described. For years since 1911 the basic sources are the U. S. Bureau of Mines annual publications, "Metal-Mine Accidents in the United States" and "Accidents at Metallurgical Works in the United States." Employment in Alaska is of course excluded. For copper mills, separate data are available back to 1915; however, as with metal mining as a whole, employment at auxiliary works connected with mills is not separated from similar employment attached to smelters. A single series covers both. We therefore estimated the former (which alone we wish to include), using ratios already derived for metal mining as a whole. The computations are shown in Worksheet IV, and were carried through in terms of mandays only. Active period averages for men employed were then adjusted on the basis of the manday relationships. The procedure for manhours is discussed below.

For 1911–14 employment at copper milling establishments is not available. For these years the manday index in Table A-5 was derived by extrapolating the 1915 figure, and employment data relating exclusively to mines were used. The figures for these years, taken from "Metal-Mine Accidents in the United States," are:

	Men (thous.)	*Mandays* (mil.)
1911	44.7	13.77
1912	51.3	15.69
1913	55.7	17.22
1914	44.1	12.68
1915	46.5	13.98

Footnotes to Table A-3 continued on next page.

Footnotes to Table A-3, continued.

Worksheet IV

Derivation of Manday Employment in Copper Mining and Milling, 1915–39
Thousand mandays, except column (3)

Year	(1) *Mines Only*[a]	(2) *Mills*[b]	(3) *Ratio*[c]	(4) *Mills and Auxiliary Works*[d]	(5) *Mines and Mills*[e]
1915	13,984	..	..	2,651[f]	16,635
1916	18,680	2,827	1.1940	3,375	22,055
1917	18,829	3,343	1.2018	4,018	22,847
1918	18,900	2,711	1.2580	3,411	22,311
1919	11,632	1,636	1.2771	2,089	13,721
1920	10,930	1,787	1.3156	2,351	13,281
1921	4,318	435	1.2986	565	4,883
1922	7,326	1,154	1.3677	1,578	8,904
1923	10,071	1,565	1.3526	2,117	12,188
1924	10,023	1,956	1.3165	2,576	12,599
1925	10,059	2,018	1.3294	2,683	12,742
1926	10,332	2,199	1.3200	2,902	13,234
1927	9,464	1,838	1.3316	2,447	11,911
1928	9,765	1,911	1.3742	2,626	12,391
1929	11,849	2,010	1.3463	2,707	14,556
1930	8,136	1,546	1.3435	2,076	10,212
1931	5,040	1,138	1.3195	1,502	6,542
1932	2,277	476	1.4105	672	2,949
1933	1,689	324	1.3936	451	2,140
1934	1,840	411	1.3631	560	2,400
1935	2,774	657	1.3142	863	3,637
1936	4,333	914	1.3342	1,219	5,552
1937	6,467	1,406	1.3763	1,935	8,402
1938	4,301	871	1.4388	1,254	5,555
1939	5,255	1,077	1.4031	1,511	6,766

[a] U. S. Bureau of Mines, "Metal-Mine Accidents in the United States." In the exclusion of Alaska, when data for copper mining in that territory were not given explicitly they could be obtained by deducting employment in gold, silver and miscellaneous metal mining from employment in all metal mining in Alaska.

[b] U. S. Bureau of Mines, "Accidents at Metallurgical Works" and bulletins on "Health and Safety Statistics." Data do not include employment at auxiliary works. Copper mills, if any, in Alaska are included; but employment at such mills is slight and (according to a letter from Mr. W. W. Adams of the Bureau of Mines) in 1939 was zero. For 1930 and earlier years figures cover only mills employing 30 or more persons; for 1931, 28 or more persons. For 1932–39 coverage is believed to be complete. Figures available for 1932 suggest that the number of persons employed at mills with fewer than 28 employees is negligible.

[c] Ratio of mandays at mills and auxiliary works attached to them to mandays at mills only, all metal mining. See Worksheet I column (6).

[d] (2) × (3).

[e] (1) + (4).

[f] U. S. Bureau of Mines, "Accidents at Metallurgical Works." This figure apparently includes auxiliaries.

Data on manhours are shown for all years for which reasonably good figures can be constructed. Their reliability is compromised chiefly by the fact that figures on hours per day (used to convert mandays to manhours) usually relate to nominal rather than to actual hours worked. For 1931–39 manhours in copper mining are given in "Metal-Mine Accidents." For 1932–39 manhours at mills (excluding auxiliaries) were taken from "Accidents at Metallurgical Works"; manhours at auxiliaries were estimated by multiplying mandays at copper auxiliaries (column 4 minus column 2, Worksheet IV) by average hours per day reported for all auxiliary works. For 1931 manhours at copper mills and auxiliaries were derived by multiplying mandays at such establishments (see Worksheet IV) by average hours per day reported for all mills and auxiliary works. (In years when hours per day at all mills, and at copper mills only, were both available, they were close enough to warrant our following this procedure to obtain the estimate for 1931.) For 1919 and 1929 the manhour estimates are based on average (nominal) hours per day for copper mining, taken from the Census of Mines and Quarries for those years; these averages rest on distributions of mines working a given number of hours per week. Average hours per week were then divided by an estimate of days worked per week from the 1929 Census. (For 1929 it was possible also to derive an hours figure from "Metal-Mine Accidents." The Census figure was considered preferable because of the apparently incomplete coverage of the hours data reported for that year in "Accidents.") The figure for manhours in 1902 was derived above in the note on metal mining as a whole (see Worksheet III).

Other Nonferrous Metals

This classification is essentially a catch-all for metal mining other than iron ore and copper (both of which are discussed above). It includes especially lead, zinc, gold, silver, mercury, bauxite, pyrites and manganese. Employment at milling establishments as well as at mines is covered. As already explained, placer mining has not been included. Much the most important industries in the group are lode gold and silver, and lead and zinc. However, the only breakdown by industries in which separate employment and output figures can be related is a partial one, viz., lead and zinc mining (not including milling) in the Mississippi Valley, and mercury mining and recovery. For these two divisions separate employment data are given in Table A-4 below.

In good part the figures for employment at other nonferrous metal mines in Table A-3 have been derived by subtracting data given there for iron ore and copper from the totals for metal mining and milling. Here we shall note only those cases where this procedure was not followed, and where figures for the group were obtained separately. Thus the derivation of the figures for 1902 has already been given in Worksheet III above. There remains the question of manhours.

For 1919 we estimated manhours by multiplying our manday figure by an estimate of hours per day from the Census of that year. For 1929 and 1930 we obtained manhours in mining by multiplying mandays in mining by a figure for average hours per shift derived from data in the accident reports. This computation was made separately for the following accident bulletin classifications: lead and zinc (Mississippi Valley); and gold, silver and miscellaneous metal mines. Manhours in milling in 1929 and 1930 were derived by subtracting estimated manhours in copper and iron ore milling from manhours in all metal milling. (Manhours in all metal mills and auxiliaries were estimated in these years in the manner described for 1929 in the note on "Metal mining" above.)

For 1911–15 employment at mills is not available. For these years we derived the manday index in Table A-5 by extrapolating the 1916 figure, using employment data relating to mines only. The figures, based on "Metal-Mine Accidents in the United States," are:

Footnotes to Table A-3 continued on next page.

Footnotes to Table A-3, continued.

	Men (thous.)	*Mandays* (mil.)
1911	58.2	15.88
1912	53.7	14.67
1913	61.5	17.01
1914	49.0	13.43
1915	48.3	13.69
1916	69.8	19.19

Pennsylvania Anthracite

Data for men employed are from *Minerals Yearbook* and its predecessor *Mineral Resources*. These figures are available also in U. S. Bureau of Mines, "Coal-Mine Accidents in the United States," but for the years 1909, 1911, 1933-35 and 1938 the two sources differ slightly. For 1909 both took their figures from the Census of Mines and Quarries of that year, but the latter used a preliminary figure only. In 1911 the two sources made separate canvasses; the same is true for years after 1930. Where slight differences occurred between the two sources, we chose the *Minerals Yearbook* data, in order to obtain employment figures from the same source as those for output.

Mandays were derived as follows. For 1899–1911, the average number employed was multiplied by average days active, both from *Mineral Resources*. For 1912–32, the data were taken directly from "Coal-Mine Accidents." For 1933–34, the average number employed was multiplied by average days active, both from *Minerals Yearbook*. For 1935–39, mandays were derived directly from *Minerals Yearbook*.

Manhours in 1901 and 1902 were obtained by multiplying mandays by 9.5, the average hours per shift derived by the National Research Project from 1902 Census material (Vivian E. Spencer, *Mineral Extractive Industries, 1880–1938*, Philadelphia, 1940, p. 154). For 1903–29, the figures represent multiplication of mandays by the established length of the shift: 9.0 hours from 1903 to 1915, 8.5 for 1916 (hours per shift changed from 9 to 8 in May), 8.0 from 1917 to 1929. (See *ibid.*, p. 117.) For 1930–39, data are from accident bulletins; where our manday figure differed from the bulletin figure, we adjusted manhours according to the ratio of the two.

Bituminous Coal

Data for men employed are from *Minerals Yearbook* and its predecessor *Mineral Resources*. These figures are also available in "Coal-Mine Accidents," but for the years 1909, 1911, 1913, 1931 and 1933–39 the two sources differ slightly. For 1909 both sources took their figures from the Census of that year, but the latter used a preliminary figure only. In 1911 the two sources made separate canvasses, and in 1913 the bulletins printed an unrevised *Mineral Resources* figure. From 1930 onward the two sources again made separate canvasses. Where slight differences occurred between the sources, we chose the *Minerals Yearbook* (or National Research Project) data, in order to obtain employment figures from the same source as those for output.

Mandays were derived as follows. For 1899–1911 and 1913, the average number employed was multiplied by average days active, both of which came from *Mineral Resources*. For 1912 and 1914 to 1925, the data were taken directly from "Coal-Mine Accidents." For 1926–33, mandays were taken from a special Bureau of Mines tabulation whose results appear in Willard E. Hotchkiss and others, *Bituminous-Coal Mining* (National Research Project, Philadelphia, 1939), Vol. II, p. 358. For 1934–38, *Minerals Yearbook*. Through 1925 days active or mandays were apparently derived by states; for 1926 and later years by individual mines.

To obtain manhours in 1902 we multiplied mandays by 8.8, a figure for hours per shift derived from the 1902 Census. For 1903–29 mandays were multiplied by the U.S. Geological Survey's series on average hours per day. ("Coal-Mine Accidents" also gives a manhour figure for most of these years, but we have preferred the former method. The manday figure used in the accident calculations is simply

the product of average numbers employed and average days active for each state, summed to yield a United States total. See William W. Adams, "Coal-Mine Fatalities in the United States, 1927," U. S. Bureau of Mines, *Bulletin 293*, pp. 62-63. For years since 1926 the manday figures we have used are presumably derived for individual mines.) For 1930–38, manhours were taken from "Coal-Mine Accidents," but were adjusted by the ratio of *Minerals Yearbook* mandays to accident bulletin mandays, for comparability with the former.

For 1939, only accident bulletin data are available. We have used them without adjustment, since they differ only slightly from *Minerals Yearbook* data through 1938.

Oil and Gas Wells

Prior to the Census of Mineral Industries for 1939 there was no comprehensive survey of employment in the petroleum and natural gas industry. Bureau of Mines statistics similar to those we have used for most other important mineral industries are not available except for a few recent years. For years prior to 1939, information from the decennial Censuses is either lacking altogether, or deficient. In 1929, for instance, no attempt whatever was made to cover the industry. In the reports on the industry in 1909 and 1919 a very important part of total operations —that conducted by contractors—remain untouched. Only in the Census of 1902 was information collected in anything approaching as comprehensive a fashion as that of the Census of 1939. Since we wish to cover the operations of contractors as well as of regular producers (see the discussion in Chapter 10), 1902 and 1939 represent benchmarks in our employment estimates for this industry.

In relatively recent years data purporting to cover the industry have appeared in several places. For the period 1935–38, for example, figures on employment at oil and gas wells and at natural gasoline plants were published in *Minerals Yearbook*. These figures represent a brave beginning, but unfortunately they suffer from deficiencies common to most surveys of the industry—incomplete coverage of contract employment. The same defect is found to exist in the Bureau of Labor Statistics index of employment in crude petroleum production. This defect could be overlooked if contract employment were of relatively small magnitude, or if its relative importance remained unchanged over the period. We know that neither of these conditions is satisfied. Hence the level of contract employment must somehow be estimated. The Petroleum Code Authority under NRA made an attempt to do this. The estimates made covered contract employment in drilling (the chief activity of contractors) and related to representative dates in 1929, 1933 and 1934. These estimates can be found in the Temporary National Economic Committee hearings on the petroleum industry (Part 16, 1940, p. 9285), together with comparable figures for 1936 and 1938 estimated by regional production committees of the American Petroleum Institute. Unfortunately we know too little of the methods used in making these estimates to find them useful here. It is difficult, moreover, to convert them into annual averages.

The most ambitious attempt yet made to estimate total industrial employment (including that incidental to work performed on a contract basis) is that by the National Research Project (O. E. Kiessling and others, *Petroleum and Natural-Gas Production*, Philadelphia, 1939), in Table A-11 (p. 327) of its report. The figures in this table represent the abstract of an enormous amount of research, details of which are to be found in underlying worksheets placed at our disposal by Dr. Kiessling. For the most part we have reproduced the NRP data. In some cases we have chosen to make slight alterations, indicated in the following notes. In other cases we have preferred to omit data for certain years as apparently less reliable.

The data relate to wage earners only. In this regard they differ from figures for other industries which are based on mine accident statistics, and include all persons subject to mine hazards. Figures for men employed are full year averages. Since the production of petroleum and natural gas is a continuous process, there

Footnotes to Table A-3 continued on next page.

Footnotes to Table A-3, continued.

is little if any difference between a full year and an active period average in this industry. (The Census reported a full year average of 153,559 persons and an active period average of 163,717 for 1939. These figures exclude nonproducing operations and some small producers.) For reasons set forth in Chapter 3, no figures are presented for mandays. The derivation of the data is explained in Worksheet v. Estimates for employment in 1909 and 1919 will be found in the NRP report. We have not reproduced the NRP figures for these years because we believe that the basic data used for the estimate of contract manhours, although the best available, were not really adequate for our purpose.

Worksheet v

Derivation of Employment Estimates for Petroleum, Natural Gas and Natural Gasoline

	Regular Producers		*Contractors*		*Total*	
Year	Wage Earners	Manhours (thous.)	Wage Earners	Manhours (thous.)	Wage Earners	Manhours (thous.)
1902	22,230[a]	81,824[b]	10,040[c]	36,955[d]	32,270	118,779
1929	..	328,032[b]	..	85,288[b]	179,000[b]	413,320
1935	108,735[b]	187,727[b]	30,870[e]	48,533[b]	139,610	236,260
1936	119,100[b]	228,600[b]	35,870[e]	62,700[f]	155,000	291,300
1937	126,800[b]	250,700[b]	40,370[e]	72,700[f]	167,200	323,400
1938	122,400[g]	247,700[g]	41,050[e]	75,700[f]	163,400	323,400
1939	113,498[h]	206,712[h]	40,061[h]	66,479[h]	153,559	273,191

[a] U. S. Bureau of the Census, *Special Reports,* "Mines and Quarries, 1902," p. 93.

[b] O. E. Kiessling and others, *Petroleum and Natural-Gas Production* (National Research Project, Philadelphia, 1939), p. 327.

[c] The 11,217 employees reported by contractors ("Mines and Quarries, 1902," p. 104) apparently include some salary earners. We assumed this figure included at least foremen, supervisors, etc. For regular producers this class of salaried worker represented 10.49 percent of wage earners plus foremen, supervisors, etc. We therefore reduced the count of 11,217 employees reported by contractors by this percentage, i.e., to 10,040.

[d] Calculated on the assumption that average hours per year were the same as for wage earners engaged in regular production.

[e] Derived from manhour data in the next column. The 1939 Census reports hours per year at 1,659 for contract wage earners and 1,821 for regular wage earners. For 1935–38 hours per year for regular wage earners, derived from the two preceding columns, were adjusted downward in the ratio mentioned to yield an estimate of hours per year for contract wage earners.

[f] Derived from manhours of wage earners employed by regular producers in a preceding column. The ratio of manhours in contract employment to manhours in regular employment was interpolated between 1935 and 1939 along a straight line. There is evidence that the share of contract operations in oil and gas well operations as a whole has increased rather steadily in recent years.

[g] For 1938, *Minerals Yearbook* reports 117,570 persons working 237,857 thousand manhours in petroleum, 8,090 persons working 16,416 thousand manhours in natural gas, and 9,205 persons working 18,818 thousand manhours in natural gasoline production. These figures apparently include salary earners. If we exclude the latter, using ratios for 1935 from Kiessling and others, *op. cit.,* p. 318, we have 108,365 wage earners working 219,235 thousand manhours in petroleum, 5,856 wage earners working 11,884 thousand manhours in natural gas, and 8,134 wage earners working 16,629 thousand manhours in natural gasoline production.

[h] From preliminary releases of Census of Mineral Industries, 1939; see also Table A-19 below. For the sake of comparability with other years employment at nonproducing operations, and at enterprises classed by the Census as "small producers," has been excluded. In general small producers have a value of products less than $2,500.

Stone Quarrying

Some peculiarities of this industry ought first to be noted. Employment at noncommercial operations—during the past decade these have been of increasing importance in the case of crushed stone—is still largely unrecorded. The statistics shown here are therefore confined to commercial quarries. Employment reported at "outside works" (i.e. stone dressing plants) has been included in the case of nondimension, and excluded in the case of dimension, stone. It so happens that dimension trap rock (basalt) is mainly a byproduct of nondimension quarrying, and that, contrariwise, crushed marble and slate come chiefly from dimension quarries. Employment reported for dimension trap rock quarries has therefore been included with the nondimension industry; while nondimension marble and slate quarries (such as they are) have been classified with the corresponding dimension establishments. (A corresponding treatment was adopted in constructing the indexes of output, all basalt being classed as crushed, all marble and slate as dimension; see Table A-1.)

The construction of indexes of employment for the stone industries actually involved a more complicated series of operations than in the case of nonferrous metals, although the latter are much larger employers of labor. The difficulties we encountered stemmed from the generally unsatisfactory character of the data, and especially from their obvious and serious variations in coverage. A critique of the data, and a discussion of the problem of matching output and employment in these industries, will be found in Appendix C. In the following notes we shall merely indicate the steps actually performed in the derivation of the estimates, without making any detailed attempt to explain why particular assumptions were chosen. The methods adopted were, for the most part, the result of extensive correspondence, both with authors of National Research Project reports and with officials of the Bureau of Mines. The reader who is interested in the general question of ways and means to estimate employment at stone quarries, rather than in the derivation of the actual estimates offered here, should turn to Appendix C.

The computations were carried out mainly in terms of mandays; figures for the number of men employed (active period averages) and for the number of manhours worked were usually obtained indirectly from the manday estimates. Moreover, in discussing productivity, we have relied mainly on manday measures. For these reasons, and for the sake of brevity, the detailed description to follow will be confined to mandays, with only the barest indication as to how figures for men or manhours were derived.

For 1902, no employment estimates are offered here (see, however, Chapter 3, where some figures for quarry employment in 1902 will be found). The omission is to be charged to the impossibility of constructing satisfactory output indexes for stone in that year.

For 1911–39, the basic source of employment data for the stone industries is the Bureau of Mines annual publication "Quarry Accidents in the United States." The manner in which the figures there given were converted into estimates suitable for our purpose is shown in the series of Worksheets VI–XI.

For the years 1911–21 employment at dimension and nondimension quarries is combined for the several kinds of stone (granite, limestone, etc.). The reports began to show employment separately at the two kinds of quarry from the year 1922. Since we wished to include employment at nondimension "outside works" (especially crushing plants), but to exclude the operations of outside works at dimension quarries (the latter engaged in stone dressing—a form of manufacturing), a segregation between the two kinds of outside works had to be attempted. The various steps in the construction of estimates for these years are indicated in Worksheet VI.

Footnotes to Table A-3 continued on next page.

Worksheet VI

Derivation of Mandays at Dimension and Nondimension Stone Quarries, 1911–21[a]

Thousand mandays

	Cement Rock[b]		*Granite*				*Limestone*[c]				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Year	At Quarries	At Quarries and Crushers[f]	At Quarries	At All Outside Works	At Non-dimension Outside Works[g]	Total (3) + (5)	At Quarries	At All Outside Works	At Non-dimension Outside Works Including Limekilns[h]	At Limekilns[i]	Total (7) + (9) — (10)
1911	1,651	1,929	3,004	1,524	408	3,412	9,137	3,104	2,747	1,508	10,376
1912	1,034	1,208	2,976	1,684	451	3,427	10,080	3,787	3,352	1,543	11,889
1913	1,354	1,582	2,799	1,485	398	3,197	9,491	3,607	3,193	1,547	11,137
1914	1,142	1,334	2,509	886	237	2,746	7,626	2,318	2,052	1,432	8,246
1915	1,190	1,391	2,871	1,500	402	3,272	8,015	2,226	1,970	1,512	8,473
1916	1,189	1,390	2,380	1,161	311	2,692	7,739	2,704	2,393	1,676	8,456
1917	1,180	1,379	2,102	1,090	292	2,394	7,371	2,651	2,346	1,536	8,181
1918	902	1,054	1,494	749	201	1,695	6,790	2,410	2,133	1,282	7,641
1919	938	1,096	1,761	736	197	1,959	6,711	3,206	2,838	1,314	8,235
1920	1,232	1,440	2,093	794	213	2,306	7,343	3,812	3,374	1,541	9,176
1921	959	1,121	1,572	531	142	1,714	5,728	3,091	2,736	1,206	7,258

For footnotes see pp. 330-31.

Worksheet VI (concluded)

Derivation of Mandays at Dimension and Nondimension Stone Quarries, 1911–21[a]

Thousand mandays

Year	*Marble*[d]	*Sandstone*				*Slate*[d]	*Trap Rock*[e]	*Grand Total*
	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
	At Quarries	At Quarries	At All Outside Works	At Nondimension Outside Works[j]	Total (13) + (15)	At Quarries	At Quarries and Outside Works	(2) + (6) + (11) + (12) + (16) + (17) + (18)
1911	639	1,758	551	195	1,953	1,005	1,359	20,673
1912	942	1,535	533	189	1,724	1,072	1,459	21,721
1913	737	1,602	448	158	1,760	947	2,000	21,360
1914	693	1,611	248	88	1,699	955	1,563	17,236
1915	744	1,405	537	190	1,595	1,019	1,386	17,880
1916	596	1,001	403	142	1,143	877	1,080	16,234
1917	458	718	502	178	896	831	1,300	15,439
1918	272	547	391	138	685	488	781	12,616
1919	333	575	212	75	650	579	1,207	14,059
1920	453	820	243	86	905	765	1,459	16,504
1921	569	551	167	59	610	626	1,147	13,045

For footnotes see pp. 330-31.

Footnotes to Table A-3, continued.

[a] Columns (1), (3), (4), (7), (8), (12), (13), (14), (17) and (18) are transcribed directly from U. S. Bureau of Mines, "Quarry Accidents in the United States," with the following exceptions. For 1911–14 employment between quarries and outside works is distinguished only in terms of men. Where necessary, therefore, we allocated total mandays as published for these years between quarries and outside works in the proportion in which men employed were so divided for the year in question. For 1917 all California quarries were reported in the totals for granite, and for 1918 in the figures for sandstone. Accordingly we reduced the published data for granite in 1917 and for sandstone in 1918, and increased the other categories correspondingly, as follows (figures in thousands of mandays are based on the known distribution of California employment at different types of quarry in 1916):

	1917		*1918*	
	At Quarries	At Outside Works	At Quarries	At Outside Works
Deducted from published figures:				
Granite	280	413	..	..
Sandstone	..	..	404	1,055
Added to published figures:				
Cement rock	82	326	73	653
Granite	..	..	155	228
Limestone	77	46	69	93
Marble	7	..	6	..
Sandstone	3	..	..	..
Trap rock	111	40	99	79

In 1919 and 1920 employment at trap rock quarries in California is included in the reported figure for granite. On the basis of the relative values of granite and trap rock produced in California in these years, the following adjustments were made (in thousand mandays):

	1919		*1920*	
	At Quarries	At Outside Works	At Quarries	At Outside Works
Deducted from granite as published and added to trap rock	96	56	202	109

In 1917 and 1918 all Colorado quarries are included under limestone, but we considered the distortion so introduced too slight to warrant an adjustment.

[b] Consists chiefly of limestone used for making cement.

[c] Except limestone for cement.

[d] Since marble and slate quarries produce little but dimension stone, no allowance is made for employment at nondimension outside works.

[e] Because trap rock quarries produce little but nondimension stone, all outside works are regarded as nondimension, and all of such employment is included.

[f] Column (1) multiplied by 1.1686. This is the ratio of mandays at quarries and crushers to mandays at quarries, from "Quarry Accidents in the United States, 1925." (An alternative procedure would be to distribute employment recorded for outside works between crushers and cement mills, using a similar ratio; but figures for cement rock outside works, prior to 1925, exhibit symptoms of undercoverage, and the method indicated was chosen.)

[g] Column (4) multiplied by .26787. This is the ratio of 175,485 mandays reported for nondimension outside works in 1922 to 655,123 mandays for all outside works in that year. (Employment reported at "all other and not stated" outside works in 1922 was allocated to dimension.)

[h] Column (8) multiplied by .88510. This is the ratio of 3,284,197 mandays reported for nondimension and "all other and not stated" outside works in 1922 to 3,710,537 mandays for all outside works in that year. (Employment at "all other and not stated" outside works was allocated to nondimension in all years.)

[i] See Worksheet VII.

[j] Column (14) multiplied by .35379. This is the ratio of 95,744 mandays reported

for nondimension outside works in 1922 to 270,626 mandays for all outside works in that year. (The category "all other and not stated" does not appear for sandstone in 1922, in which year all employment was definitely distributed between dimension and nondimension.)

In the case of limestone, employment at all outside works through 1921, and at nondimension outside works for 1922 and later years, includes the operation of limekilns—a form of fabrication. Estimates of the limekiln employment which has to be deducted are offered in Worksheet VII.

Although dimension and nondimension quarries and outside works began to be segregated in 1922, it happens that employment in the two kinds of production was not always clearly distinguished in the reports submitted, for in all years since 1922 figures are given also for employment at a group of establishments labeled "all other and not stated." Fortunately it is often possible to judge by inspection whether "all other and not stated" employment for a particular variety of stone is predominantly either dimension or nondimension in character. Such a judgment is based upon the distribution given for this employment between quarries (proper) and outside works (i.e. stone dressing plants). For outside works are far more important in connection with dimension than with nondimension operations. Frequently we included "all other and not stated" employment either in the total for dimension, or for nondimension, on this basis. In other years or for other kinds of stone the distribution could not be made by inspection, whereupon we adopted what seemed to us the simplest assumption, as follows. Let a and b be ratios of mandays in quarries to mandays in quarries and outside works, for dimension and nondimension quarries respectively, as determined in each year and for each kind of stone by that portion of the data for which the distribution is available. We know in each case Q and O, mandays reported as "all other and not stated" at quarries and outside works respectively. Put $D = \frac{bO - (1 - b)Q}{b - a}$ and $N = \frac{(1 - a)Q - aO}{b - a}$,

where D and N are the "all other and not stated" mandays to be allocated respectively to dimension and to nondimension quarries. This assumes that the ratios a and b are the same for "all other and not stated" as for the establishments for which the distribution between quarries and outside works is reported. D may then be apportioned aD to quarries, and $(1 - a)D$ to outside works; and N apportioned bN to quarries and $(1 - b)N$ to outside works.

With the help of this device the figures reported in "Quarry Accidents" for "all other and not stated" in 1922–39 are segregated into nondimension quarries and outside works (crushers) in Worksheet VIII and dimension quarries in Worksheet XI. (Employment at dimension outside works we exclude from the totals.)

There remains the question of changing coverage, discussed in Appendix C below. Adjustment of the data on this account is possible only for nondimension stone and for the years 1929–39 alone. The elaborate study undertaken by the National Research Project (see Harry S. Kantor and Geoffrey A. Saeger, *Crushed-Stone Industry*, Philadelphia, 1939) makes it very clear that the "Quarry Accident" coverage of nondimension stone (including neither cement rock nor limestone for lime) increased rapidly from but 50 to nearly 100 percent during the 1930's; and comparison with the Census of Mineral Industries for 1939 suggests that the coverage of the accident data is now substantially complete. For cement rock a Bureau of Mines canvass of cement manufacturers makes possible a similar analysis of changing coverage in this branch of quarrying. Adjustments, based upon these investigations, to the accident data in Worksheet VIII are carried out for 1929–39 in Worksheets IX and X.

The above discussion, in conjunction with the accompanying worksheets, describes the construction of our manday estimates. For men employed (active period averages) we made rough estimates for 1929–39 only. The data are not used to construct indexes of employment and productivity, but only to obtain totals for men

Footnotes to Table A-3 continued on next page.

Footnotes to Table A-3, continued.

employed in mining as a whole. They were derived by adjusting the accident bulletin figures for men employed by the ratios of our manday totals for dimension and nondimension stone to the "Quarry Accident" totals.

Manhours are shown for all the years for which estimates could be made. For 1919, we derived them by multiplying our manday figures by a figure for average hours per shift (9.45) from Vivian E. Spencer, *Mineral Extractive Industries* (National Research Project, Philadelphia, 1940), p. 137. For dimension stone in 1931–39 manhours are for the most part given explicitly in "Quarry Accidents." However, the division of "all other and not stated" between dimension and nondimension was carried out in manday terms (see Worksheets VIII and XI). The mandays affected we converted to manhours, using separate data for hours per shift at "all other and not stated" for each variety of stone. For 1929 and 1930 hours per shift data for each variety were extracted from "Quarry Accidents."

For nondimension stone in 1929–39 manhours were derived as follows. For 1929–36 granite, sandstone, trap rock and limestone (except limestone for lime and cement rock) are from the National Research Project (see Worksheet IX); for 1937–39 mandays were multiplied by an average hours per shift for each year, from "Quarry Accidents." For cement rock manhours come from the same source as mandays. The same is true of limestone for lime and dimension trap rock for the years 1931–39. For 1929 and 1930 manhours at quarries and crushers producing limestone for lime are from U. S. Bureau of Mines, "Health and Safety Statistics," No. 141. Mandays in dimension trap rock for the same two years were multiplied by figures on hours per shift for such operations from "Quarry Accidents." A figure for nondimension manhours in 1929, comparable with earlier years, is shown only because it was used in obtaining the corresponding item for total stone. It was derived by multiplying the manday figure by an average hours per shift for nondimension stone from data comparable with later years.

Worksheet VII

Derivation of Mandays at Limekilns, 1911–39

Year	(1) *Average Number*[a] *Employed*	(2) *Lime Sales*[b] (th.s.t.)	(3) *Output per Wage Earner*[c] (s.t.)	(4) *Mandays at Limekilns*[d] (thous.)
1909	13,725	3,485	253.9	..
1910	13,579	3,506	258.2	..
1911	12,926	3,393	262.5	1,508
1912	13,231	3,530	266.8	1,543
1913	13,261	3,595	271.1	1,547
1914	12,275	3,381	275.4	1,432
1915	12,967	3,623	279.4	1,512
1916	14,367	4,073	283.5	1,676
1917	13,169	3,786	287.5	1,536
1918	10,995	3,206	291.6	1,282
1919	11,264	3,330	295.6	1,314
1920	13,212	3,570	270.2	1,541
1921	10,345	2,532	244.8	1,206
1922	12,630	3,640	288.2	1,473
1923	12,290	4,076	331.7	1,433
1924	11,464	4,072	355.2	1,337
1925	12,095	4,581	378.8	1,410
1926	11,639	4,560	391.8	1,357
1927	10,903	4,415	404.9	1,271
1928	9,863	4,458	452.0	1,150
1929	8,554	4,270	499.2	997[e]
1930	7,504	3,388	451.5	875[e]
1931	6,706	2,708	403.8	782
1932	..	..	..	540
1933	..	..	..	680
1934	..	..	..	808
1935	..	..	..	877
1936	..	..	..	1,072
1937	..	..	..	1,141
1938	..	..	..	992
1939	..	..	..	1,073

[a] For 1909, 1914, 1919, 1921, 1923, 1925, 1927, 1929 and 1931, Census of Manufactures. For other years, column (2) divided by column (3).

[b] U. S. Bureau of Mines, *Mineral Resources* and *Minerals Yearbook*.

[c] For 1909, 1914, 1919, 1921, 1923, 1925, 1927, 1929 and 1931, column (2) divided by column (1). For other years, by straight line interpolation.

[d] 1931–39, "Quarry Accidents in the United States," extrapolated back to 1911 by means of column (1).

[e] Figures for 1929 and 1930 more accurately comparable with later years are 1,083 th. and 969 th. mandays respectively. This extrapolation is based on manhour figures in U. S. Bureau of Mines, "Health and Safety Statistics," Nos. 141 and 235.

Footnotes to Table A-3 continued on next page.

Worksheet VIII

Derivation of Mandays at Nondimension Stone Quarries, Before Adjustment for Changing Coverage, 1922–39[a]

Thousand mandays

Year	*Cement Rock*[b]					*Granite*			*Limestone*[f]						
						At Quarries and Outside Works			At Quarries and Outside Works						
	At Quarries (1)	At All Outside Works (2)	At Cement Mills (3)	At Crushers[c] (4)	Total[d] (5)	As Given (6)	Not Stated[e] (7)	Total (6) + (7) (8)	As Given[g] (9)	Not Stated[h] (10)	At Lime-kilns[i] (11)	Cement Rock to be Ex-cluded[j] (12)	Total[k] (13)	For Lime[l] (14)	Total, excl. Limestone for Lime (15)
1922	1,072	..	..	..	1,253	727	..	727	8,766	76	1,473	..	7,369	..	..
1923	1,301	..	..	..	1,520	743	..	743	11,080	205	1,433	..	9,852	..	..
1924	1,340	..	..	..	1,566	575	..	575	10,494	620	1,337	..	9,777	..	..
1925	1,388	5,356	..	234	1,622	860	..	860	8,402	752	1,410	..	7,744	..	..
1926	1,474	5,854	..	256	1,730	409	..	409	8,265	742	1,357	..	7,649	..	..
1927	1,309	5,962	..	260	1,569	463	..	463	7,831	1,092	1,271	..	7,652	..	..
1928	1,185	5,957	..	260	1,445	353	..	353	7,926	644	1,150	..	7,420	..	..
1929	1,057	5,456	..	238	1,296	396	..	396	7,119	934	997 1,083	.. 1,301	7,056 5,669	.. 1,469	.. 4,200
1930	918	5,047	..	221	1,139	279	..	279	6,568	585	969	1,529	4,655	1,315	3,340
1931	814	4,143	3,962	..	995	260	..	260	4,426	601	782	329	3,916	1,061	2,855
1932	597	2,961	2,813	..	745	157	..	157	3,116	565	540	..	3,141	658	2,483
1933	604	3,357	3,197	..	764	225	..	225	3,818	190	680	..	3,328	557	2,771
1934	772	4,784	4,522	..	1,034	341	53	394	4,163	333	808	..	3,688	695	2,993
1935	746	4,800	4,504	..	1,042	345	53	397	3,354	59	877	..	4,725	1,312	3,413
1936	1,073	5,993	5,641	..	1,425	510	..	510	4,198	60	1,072	..	5,818	1,561	4,258
1937	1,042	6,522	6,041	..	1,523	556	135	691	4,435	60	1,141	..	6,263	1,768	4,495
1938	843	5,673	5,260	..	1,256	542	180	722	3,601	89	992	..	5,074	1,384	3,690
1939	890	6,202	5,730	..	1,362	619	126	745	3,779	99	1,073	..	5,515	1,638	3,878

For footnotes see p. 336.

Worksheet VIII (concluded)

Derivation of Mandays at Nondimension Stone Quarries, Before Adjustment for Changing Coverage, 1922–39[a]

Thousand mandays

Year	*Sandstone*			*Trap Rock*				*Grand Total* (23)	
	At Quarries and Outside Works			At Quarries and Outside Works		Reported for Dimension Quarries			
	As Given (16)	Not Stated[e] (17)	Total (16) + (17) (18)	As Given (19)	Not Stated[h] (20)	(21)	Total (22)		
1922	390	..	390	754	359	42	1,156	10,895	
1923	573	3	576	946	641	15	1,601	14,292	
1924	482	10	492	1,165	17	95	1,277	13,687	
1925	385	66	451	749	172	15	937	11,614	
1926	439	16	455	725	132	18	875	11,118	
1927	358	52	410	742	159	14	915	11,009	
1928	281	60	340	699	134	23	856	10,414	
1929	301	23	324	633	121	43	796	9,868	
1930	211	10	220	600	83	28	712	..	See Worksheet x
1931	114	35	149	454	116	10	581	..	
1932	79	8	88	428	43	0	472	..	
1933	112	10	122	340	35	12	387	..	
1934	135	10	145	406	33	4	443	..	
1935	231	30	261	522	15	0	537	..	
1936	376	15	391	565	16	0	580	..	
1937	422	11	433	537	0	3	540	..	
1938	284	22	306	542	8	2	552	..	
1939	343	2	345	513	1	3	517	..	

For footnotes see p. 336.

Footnotes to Table A-3, continued.

[a] The coverage of the data in this table, taken with minor exceptions from "Quarry Accidents in the United States," is not complete. For years prior to 1929 it does not seem possible to make any adjustment on this score. But in Worksheet x (see below) the figures for cement rock, granite, limestone, sandstone and trap rock are adjusted to what appears to be 100 percent coverage. Columns (1), (2), (3), (6), (9), (10), (16), (19), (20) and (21) are transcribed directly from "Quarry Accidents."

[b] Consists chiefly of limestone used for making cement.

[c] Column (2) multiplied by .0437. This is the ratio of mandays at crushers (995 th. — 814 th. = 181 th.) to mandays at all outside works (4,143 th.) in 1931.

[d] For 1922–24, column (1) multiplied by 1.1686. This is the ratio of total mandays (1,622 th.) to mandays at quarries (1,388 th.) in 1925. (See note f to Worksheet vi.) For 1925–30, column (1) plus column (4). For 1931–39, columns (1) plus (2) minus (3).

[e] Shows portion of "all other and not stated" allocated to nondimension stone according to formula already given.

[f] Except limestone for cement.

[g] 1922–34, includes limestone for lime; 1935–39 no longer includes limestone for lime which is for the first time given separately for these years (columns 11 and 14).

[h] We allocated the whole of employment designated "all other and not stated" to nondimension quarries, and this column is therefore a simple transcription from "Quarry Accidents."

[i] See Worksheet vii.

[j] Correspondence with the Bureau of Mines established that some cement rock employment is included with limestone in these years. The amount to be deducted was derived from a comparison of "Quarry Accidents" and *Minerals Yearbook* data, and, so far as it consists of quarry employment, is added back in column (2) of Worksheet x.

[k] 1922–34, columns (9) plus (10) minus (11) minus (12). 1935-39, columns (9) plus (10) plus (14).

[l] Obtained by deducting mandays at limekilns (Worksheet vii) from total mandays engaged in the production of limestone for lime. For 1929–34 the latter were estimated by dividing corresponding figures for manhours (U. S. Bureau of Mines, "Health and Safety Statistics," Nos. 141 and 235) by hours per day at limekilns derived from "Quarry Accidents."

Worksheet IX

Derivation of Coverage Adjustment for Nondimension Stone, 1929–36[a]

Year	(1) Granite	(2) Limestone[b]	(3) Sandstone	(4) Trap Rock	(5) Resulting Total	(6) Full Coverage[c]	(7) Adjustment Ratio (6) ÷ (5)
			Thousand mandays				
1929	396	4,200	324	754	5,673	..	..
1930	279	3,340	221	683	4,523	..	..
1931	260	2,855	149	570	3,834	..	..
			Thousand manhours				
1929	..	..	..	..	52,759	95,873	1.8172
1930	..	..	..	..	41,159	84,496	2.0529
1931	2,247	24,090	1,317	4,894	32,548	64,591	1.9845
1932	1,279	20,943	782	4,023	27,028	47,535	1.7587
1933	1,882	22,286	1,006	3,059	28,232	42,220	1.4955
1934	2,994	23,829	1,146	3,450	31,419	43,911	1.3976
1935	3,075	27,029	2,113	4,234	36,451	39,838	1.0929
1936	4,337	34,753	3,287	4,788	47,165	50,390	1.0684

[a] The derivation of columns (1) to (5) is as follows. For mandays in granite, limestone and sandstone see Worksheet VIII. Mandays in trap rock quarries are transcribed directly from "Quarry Accidents," and differ from figures for trap rock in Worksheet VIII because they do not cover dimension quarries. For 1931–36 manhours were obtained by methods similar to mandays: see notes to Worksheet VIII. For 1929 and 1930 manhours were derived from mandays as follows. Hours per day as shown were 8.5 in 1931. From Vivian E. Spencer, *Mineral Extractive Industries* (National Research Project, Philadelphia, 1940), Table A-26, columns (7) and (8) corresponding figures of 8.6, 9.2 and 9.4 may be obtained for 1931, 1930 and 1929 respectively. Accordingly, manhours are found by multiplying mandays by 8.5 × 9.2/8.6 in 1930 and 8.5 × 9.4/8.6 in 1929.

[b] Excluding cement rock and limestone for lime.

[c] Data for commercial operations only, from Harry S. Kantor and Geoffrey A. Saeger, *Crushed-Stone Industry* (National Research Project, Philadelphia, 1939), Table 4, p. 18 (average number of men employed at commercial operations multiplied by average hours per man per year at such operations).

Footnotes to Table A-3 continued on next page.

Worksheet x

Adjustment of Mandays at Nondimension Stone Quarries for Coverage, 1929–39[a]

Thousand mandays

Year	*Cement Rock*[b]			*Unadjusted Data*									
	Un-adjusted (1)	Adjust-ment[c] (2)	Total (3)	Granite (4)	Lime-stone[d] (5)	Sand-stone (6)	Trap Rock (7)	Total (8)	*Adjustment Ratio*[e] (9)	*Column (8) Adjusted*[f] (10)	*Limestone for Lime* (11)	*Dimen-sion Trap Rock*[g] (12)	*Grand Total*[h] (13)
1929	1,296	449	1,745	396	4,200	324	754	5,674	1.8172	10,311	1,469	43	13,567
1930	1,139	500	1,639	279	3,340	221	683	4,523	2.0529	9,285	1,315	28	12,268
1931	995	191	1,186	260	2,855	149	570	3,834	1.9845	7,609	1,061	10	9,866
1932	745	81	826	157	2,483	87	471	3,198	1.7587	5,624	658	..	7,108
1933	764	55	819	225	2,771	122	375	3,493	1.4955	5,224	557	12	6,611
1934	1,034	..	1,034	394	2,993	145	439	3,971	1.3976	5,550	695	4	7,284
1935	1,042	..	1,042	398	3,413	261	537	4,609	1.0929	5,037	1,312	..	7,392
1936	1,425	..	1,425	510	4,258	391	580	5,739	1.0684	6,132	1,561	..	9,118
1937	1,523	..	1,523	691	4,495	433	537	6,156	1.0456	6,437	1,768	3	9,731
1938	1,256	..	1,256	722	3,690	306	550	5,268	1.0228	5,388	1,384	2	8,030
1939	1,362	..	1,362	745	3,878	345	515	5,483	1.0000	5,483	1,638	3	8,486

[a] Since adjustments shown here cannot be applied to years prior to 1929, there is a discontinuity in the data for which we allow by overlap. Columns (1), (4), (5), (6), (7), (11) and (12) are taken from Worksheet VIII.

[b] Consists chiefly of limestone used for making cement.

[c] According to a communication from Mr. W. W. Adams of the U. S. Bureau of Mines, the "Quarry Accidents" data for cement rock for years prior to 1933 include chiefly quarries operated in conjunction with cement mills; they do not fully cover other quarries producing limestone for cement, some of which were probably classified with regular crushed limestone quarries. Figures for employment at quarries and crushers (including miscellaneous employment; especially baggers, truckmen, shippers, and construction workers) obtained by a canvass of cement manufacturers and published in *Minerals Yearbook* (see Table C-4 below) are reported by Mr. Adams to be practically complete. Accordingly, for 1929–33 we have substituted these figures (column 3) for the "Quarry Accidents" data (column 1); the adjustment shown is the difference between the two sets of data for these years. In part we are adding back employment deducted in column (12) of Worksheet VIII; that deduction consisted partly of cement mill employment, and was therefore larger than the adjustment shown here.

[d] Except limestone for cement and limestone for lime.

[e] For 1929–36 see Worksheet IX. Comparison with employment data from the Census of Mineral Industries, 1939, suggests that coverage of our figures (based on "Quarry Accidents") for commercial operations had become virtually complete in that year, the ratio consequently being unity. We assumed coverage increased steadily between 1936 and 1939, and the ratios shown for 1937 and 1938 are therefore interpolated along a straight line.

[f] Column (8) multiplied by column (9); assumed to represent complete coverage.

[g] Quarries only; does not include outside works. Only small amounts of employment are reported for dimension trap rock quarries, and these are included with nondimension (as dimension trap rock output is included with nondimension).

[h] Columns (3) + (10) + (11) + (12).

Footnotes to Table A-3, continued.

Worksheet XI

Derivation of Mandays at Dimension Stone Quarries, 1922–39[a]

Thousand mandays

	Granite				*Marble*			
Year	As Given (1)	Not Stated[b] (2)	Total (3)	*Limestone*[c] As Given (4)	As Given (5)	Not Stated[d] (6)	Reported for Nondimension Quarries[e] (7)	Total (8)
1922	867	38	905	849	602	22	143	767
1923	1,462	85	1,547	984	655	38	41	734
1924	1,635	143	1,778	1,355	658	3	104	766
1925	1,324	102	1,426	792	638	44	28	710
1926	924	358	1,282	489	586	70	30	686
1927	881	429	1,310	571	696	62	35	793
1928	952	444	1,396	537	742	6	33	780
1929	920	291	1,211	589	636	111	25	772
1930	807	260	1,067	545	588	14	25	627
1931	581	233	815	265	430	5	15	450
1932	426	98	524	136	269	5	14	288
1933	365	147	511	121	234	3	28	265
1934	401	129	530	58	120	1	20	141
1935	438	102	540	78	137	6	27	170
1936	565	140	704	152	180	7	31	219
1937	640	32	672	218	250	7	31	288
1938	511	15	526	171	249	39	24	313
1939	515	35	549	205	282	34	16	332

Worksheet XI (concluded)

Derivation of Mandays at Dimension Stone Quarries, 1922–39[a]

Thousand mandays

	Sandstone			*Slate*				
Year	As Given (9)	Not Stated[b] (10)	Total (11)	As Given (12)	Not Stated[d] (13)	Reported for Non-dimension Quarries[e] (14)	Total (15)	*Grand Total* (16)
1922	439	..	439	742	2	..	744	3,704
1923	483	..	483	836	..	..	836	4,584
1924	626	8	634	774	24	..	798	5,331
1925	545	9	554	697	18	20	735	4,217
1926	505	28	532	837	20	0	858	3,847
1927	322	..	322	626	16	4	646	3,642
1928	307	..	307	567	24	1	592	3,612
1929	232	23	255	526	12	0	538	3,365
1930	274	19	293	325	15	5	345	2,877
1931	146	2	147	233	22	2	257	1,934
1932	83	..	83	111	2	3	116	1,147
1933	42	..	42	104	3	3	110	1,049
1934	54	..	54	74	3	14	90	873
1935	74	..	74	117	0	75	193	1,055
1936	119	..	119	174	..	89	263	1,457
1937	121	..	121	233	18	89	341	1,640
1938	122	..	122	168	37	69	274	1,406
1939	141	1	141	224	31	74	329	1,556

[a] For dimension stone, employment reported at quarries is included, but not employment at outside works (i.e. stone dressing establishments). Columns (1), (4), (5), (7), (9), (12) and (14) are transcribed directly from "Quarry Accidents."

[b] Mandays reported for "all other and not stated" (i.e. not distributed between dimension and nondimension quarries) were allocated according to the formula already given.

[c] Mandays reported for "all other and not stated" were allocated wholly to nondimension establishments: see Worksheet VIII.

[d] Mandays reported for "all other and not stated" were distributed between dimension and nondimension establishments according to the formula already given. Although, in the case of marble and slate, both dimension and nondimension employment are included, the allocation has still to be made, in order that (small amounts of) employment at nondimension outside works may be included.

[e] The nondimension output of marble and slate is mostly a byproduct of dimension; few marble and slate quarries are classified as nondimension establishments. Therefore employment reported for nondimension marble and slate quarries and outside works (like the output of nondimension marble and slate) has been included with dimension.

Gypsum

Employment covers the mining, but not the calcining or processing, of the mineral. For 1911, 1916 and 1919–38, data are derived from Robinson Newcomb and Knute Peterson, "Production, Employment and Output per Man in Gypsum Mining," Information Circular 7134 (U. S. Bureau of Mines, 1940). This survey covers between 67 and 100 percent of output; accordingly employment figures there given were written up by the ratio of total output to output covered by the survey. The 1902 figures are based on output and are derived from the same source, it being assumed that productivity in 1902 was equal to productivity in 1900. (The Census report for 1902 does not clearly distinguish between mining and manufacturing, and for this reason was not used.) Figures for 1912–15 and 1917–18 are based on output, with the help of productivity ratios interpolated along straight lines between 1911 and 1916, and 1916 and 1919, respectively. The 1939 data come from a preliminary release of the Census of Mineral Industries, 1939.

Phosphate Rock

For 1902, figures were derived from the Census of Mines and Quarries. For 1919–37, we employed Bureau of Mines sample data as given in A. P. Haskell, Jr. and O. E. Kiessling, *Phosphate-Rock Mining* (National Research Project, Philadelphia, 1938), p. 99. We derived figures for mandays and manhours by stepping up sample mandays and manhours by the ratio of total numbers employed to sample numbers employed. For 1939, the data come from a preliminary release of the Census of Mineral Industries, 1939. For 1938 mandays and manhours are based on output, output per manday and per manhour being taken as the mean of 1937 and 1939.

Owing to the absence of comparable data for 1911, figures shown for phosphate rock employment in 1902 are not included in the totals.

TABLE A-4

ADDITIONAL EMPLOYMENT DATA[a]

Year	*Lead and Zinc Mining, Mississippi Valley*[b]		*Mercury Mining*[c]	
	Mandays (mil.)	Manhours (mil.)	Mandays (mil.)	Manhours (mil.)
1902	..	..	.450	4.28
1911	3.20	..	..	..
1912	3.78	..	..	..
1913	3.23	..	..	..
1914	2.78	..	..	..
1915	3.35	..	..	..
1916	5.44	..	..	..
1917	4.99	..	.415	..
1918	3.52	..	..	..
1919	3.27	..	..	..
1920	3.30	..	..	..
1921	1.63	..	..	..
1922	2.50	..	..	..
1923	2.96	..	..	..
1924	3.70	..	.123	.985
1925	3.61	..	.107	.860
1926	3.83	..	.112	.899
1927	3.18	..	.200	1.60
1928	2.60	..	.257	2.09
1929	2.74	22.0	.325	2.63
1930	1.84	14.8	.284	2.46
1931	1.17	9.46	.297	2.42
1932	.683	5.53	.122	.979
1933	.703	5.66	.109	.864
1934	.985	7.85	.142	1.06
1935	1.19	9.59	.160	1.23
1936	1.53	12.3	..	..
1937	1.83	14.7	..	..
1938	1.33	10.6	..	..
1939	1.57	12.4	.180	1.41

[a] Data in this table are included in, but do not exhaust, the category "Metal mining and ore dressing—other nonferrous metals" in Table A-3.

[b] Arkansas, Illinois, Iowa, Kansas, Kentucky, Missouri, Oklahoma, Tennessee, Wisconsin. Data are from U. S. Bureau of Mines, "Metal-Mine Accidents in the United States," and include fluorspar mining in Illinois and Kentucky. Figures cover mining only and do not include milling.

[c] The 1902 data are from the Census: see notes to metal mining, Table A-3. For 1939 figures are from preliminary releases of the Census of Mineral Industries. Data for other years are from sample material collected by the Bureau of Mines and published in *Minerals Yearbook;* data were adjusted by us to full coverage by ratios (varying from 1.049 to 1.380) of total output to output covered by study. Employment at recovery plants is included.

TABLE A-5

TOTAL MINING AND INDIVIDUAL MINING INDUSTRIES

Indexes of Output,[a] Employment[b] and Productivity[c]
1929:100

Year	Total, Including Oil and Gas Wells[d]			Total, Excluding Oil and Gas Wells[e]				
	Output	Manhours of Employment	Output per Manhour	Output	Mandays of Employment	Manhours of Employment	Output per Manday	Output per Manhour
1899	26.3	..	..	43.0	..	..	..	..
1900	28.4	..	..	46.0	..	..	..	..
1901	30.0	..	..	48.6	..	..	..	..
1902	31.3	73.3	43	49.8	78.1	84.5	64	59
1903	35.4	..	..	56.6	..	..	..	..
1904	36.0	..	..	56.9	..	..	..	..
1905	40.2	..	..	63.6	..	..	..	..
1906	41.8	..	..	66.4	..	..	..	..
1907	45.4	..	..	71.6	..	..	..	..
1908	42.1	..	..	65.0	..	..	..	..
1909	47.8	..	..	74.5	..	..	..	..
1910	50.8	..	..	78.6	..	..	..	..
1911	50.0	..	..	76.9	116.5	..	66	..
1912	53.4	..	..	82.4	119.7	..	69	..
1913	56.6	..	..	87.0	130.7	..	67	..
1914	52.7	..	..	78.8	112.2	..	70	..
1915	57.7	..	..	86.8	111.1	..	78	..
1916	66.6	..	..	101.1	127.3	..	79	..
1917	70.0	..	..	104.6	137.7	..	76	..
1918	70.5	..	..	104.4	137.4	..	76	..
1919	61.0	..	..	83.6	112.9	113.6	74	74
1920	70.8	..	..	96.4	123.5	..	78	..
1921	57.7	..	..	70.0	91.4	..	77	..
1922	61.9	..	..	71.7	85.5	..	84	..
1923	85.5	..	..	99.8	116.0	..	86	..
1924	80.3	..	..	91.0	106.7	..	85	..
1925	83.0	..	..	91.8	102.7	..	89	..
1926	89.9	..	..	102.4	114.5	..	89	..
1927	92.0	..	..	96.1	103.8	..	93	..
1928	91.8	..	..	94.6	97.0	..	97	..
1929	100.0	100.0	100	100.0	100.0	100.0	100	100
1930	88.1	..	..	85.6	84.8	..	101	..
1931	73.8	..	..	66.8	65.0	64.7	103	103
1932	60.1	..	..	49.4	49.3	48.8	100	101
1933	65.3	..	..	52.1	54.1	53.1	96	98
1934	70.8	..	..	59.1	63.9	58.2	92	101
1935	76.3	58.8	130	62.6	66.0	59.2	95	106
1936	89.0	68.9	129	76.6	76.0	68.4	101	112
1937	100.1	71.9	139	83.8	78.9	70.3	106	119
1938	85.6	59.0	145	64.2	61.0	54.1	105	119
1939	94.7	60.6	156	75.7	66.8	59.2	113	128

For footnotes see pp. 351-52.

TABLE A-5—INDEXES (continued)

Year	Metal Mining and Ore Dressing — Total[f] Output	Man-days of Employment	Man-hours of Employment	Output per Man-day	Output per Man-hour	Iron Ore Output	Man-days of Employment	Man-hours of Employment	Output per Man-day	Output per Man hou
1899	39.1	..	..	..	..	33.6	..	..	..	..
1900	42.8	..	..	..	..	37.3	..	..	..	..
1901	43.2	..	..	..	..	39.1	..	..	..	..
1902	47.2	97.9	110.6	48	43	48.3	139.0	154.2	35	3
1903	47.1	..	..	..	..	47.6	..	..	..	..
1904	49.1	..	..	..	..	37.6	..	..	..	..
1905	55.4	..	..	..	..	57.9	..	..	..	..
1906	58.2	..	..	..	..	65.2	..	..	..	..
1907	56.9	..	..	..	..	70.7	..	..	..	..
1908	54.3	..	..	..	..	49.0	..	..	..	..
1909	66.6	..	..	..	..	70.2	..	..	..	..
1910	68.3	..	..	..	..	78.1	..	..	..	..
1911	64.9	129.5[g]	..	50	..	60.2	162.7[g]	..	37	..
1912	72.2	132.5[g]	..	55	..	75.7	166.4[g]	..	46	..
1913	75.3	150.5	..	50	..	85.1	192.3[g]	..	44	..
1914	67.4	117.7	..	57	..	56.8	149.9[g]	..	38	..
1915	83.4	122.2	..	68	..	76.0	136.7	136.8	56	5
1916	104.2	169.0	..	62	..	103.0	181.0	182.5	57	5
1917	102.3	169.6	..	60	..	103.2	196.4	199.2	53	5
1918	98.7	159.1	..	62	..	95.3	188.7	192.7	51	4
1919	72.7	117.0	121.0	62	60	83.5	167.6	170.0	50	4
1920	77.1	115.6	..	67	..	92.6	168.3	173.1	55	5
1921	38.4	59.2	..	65	..	40.4	78.1	79.3	52	5
1922	61.3	81.6	..	75	..	64.5	103.7	103.0	62	6
1923	84.6	104.8	..	81	..	94.8	136.6	139.5	69	6
1924	82.1	104.2	..	79	..	74.2	118.1	118.4	63	6
1925	89.7	107.6	..	83	..	84.6	111.9	111.9	76	7
1926	93.2	108.0	..	86	..	92.6	108.8	109.2	85	8
1927	88.4	98.5	..	90	..	84.7	106.2	106.4	80	8
1928	91.3	92.4	..	99	..	85.2	92.7	92.6	92	9
1929	100.0	100.0	100.0	100	100	100.0	100.0	100.0	100	10
1930	78.2	78.7	..	99	..	80.2	93.0	92.9	86	8
1931	53.6	51.6	51.6	104	104	42.7	53.2	53.1	80	8
1932	29.3	28.6	28.4	102	103	13.5	21.2	21.3	64	6
1933	34.0	28.9	28.1	118	121	24.0	24.6	23.2	98	10
1934	43.2	38.0	36.7	113	118	33.7	36.9	33.0	91	10
1935	56.1	54.5	52.2	103	107	41.9	38.0	34.1	110	12
1936	76.0	68.8	66.7	110	114	66.9	53.4	48.3	125	13
1937	98.2	84.6	81.5	116	121	98.8	74.0	66.7	133	14
1938	67.2	63.5	61.2	106	110	38.9	44.2	39.7	88	9
1939	86.2	71.4	68.3	121	126	70.7	56.3	50.6	126	14

For footnotes see pp. 351-52.

TABLE A-5—INDEXES (continued)

Year	METAL MINING AND ORE DRESSING (continued) COPPER[h] Output	Man-days of Employment	Man-hours of Employment	Output per Man-day	Output per Man-hour	OTHER NONFERROUS METALS[i] Output	Man-days of Employment	Man-hours of Employment	Output per Man-day	Output per Man-hour
1899	..	..	..	..	..	..	..	..	..	..
										..
1900	..	..	..	..	..	..	..	..	..	..
1901	..	..	..	..	..	..	..	..	..	..
1902	35.6	57.5	63.0	62	56	66.2	116.1	133.0	57	50
1903	37.6	..	..	..	..	63.5	..	..	..	..
1904	43.7	..	..	..	..	66.9	..	..	..	..
1905	47.3	..	..	..	..	68.4	..	..	..	..
1906	48.8	..	..	..	..	70.0	..	..	..	..
1907	45.0	..	..	..	..	68.1	..	..	..	..
1908	50.4	..	..	..	..	66.0	..	..	..	..
1909	59.5	..	..	..	..	75.4	..	..	..	..
1910	57.1	..	..	..	..	76.9	..	..	..	..
1911	57.3	112.6[g]	..	51	..	79.8	149.7[g]	..	53	..
1912	63.9	128.2[g]	..	50	..	81.9	138.3[g]	..	59	..
1913	63.5	140.8[g]	..	45	..	85.1	160.3[g]	..	53	..
1914	58.6	103.7[g]	..	57	..	86.7	126.6[g]	..	68	..
1915	72.8	114.3	..	64	..	102.8	129.1[g]	..	80	..
1916	97.4	151.5	..	64	..	114.6	180.9	..	63	..
1917	92.6	157.0	..	59	..	115.3	165.8	..	70	..
1918	94.2	153.3	..	61	..	105.8	145.6	..	73	..
1919	59.5	94.3	96.9	63	61	81.5	108.7	112.2	75	73
1920	58.7	91.2	..	64	..	87.4	107.7	..	81	..
1921	20.9	33.6	..	62	..	62.0	75.7	..	82	..
1922	45.4	61.2	..	74	..	80.9	90.0	..	90	..
1923	71.2	83.7	..	85	..	94.1	107.4	..	88	..
1924	78.6	86.6	..	91	..	95.8	114.9	..	83	..
1925	82.6	87.5	..	94	..	104.7	127.7	..	82	..
1926	85.0	90.9	..	94	..	106.2	126.9	..	84	..
1927	81.6	81.8	..	100	..	101.1	112.2	..	90	..
1928	90.2	85.1	..	106	..	98.2	100.4	..	98	..
1929	100.0	100.0	100.0	100	100	100.0	100.0	100.0	100	100
1930	70.6	70.2	..	101	..	86.4	78.7	78.9	110	109
1931	52.6	44.9	44.6	117	118	66.6	58.2	58.6	114	114
1932	23.8	20.3	21.2	117	118	53.7	43.2	43.5	124	124
1933	20.1	14.7	14.3	137	140	58.8	48.0	47.7	122	123
1934	25.4	16.5	16.1	154	158	71.0	63.4	63.5	112	112
1935	40.1	25.0	24.4	161	164	86.9	99.2	98.1	88	89
1936	63.5	38.1	37.4	167	170	100.2	114.1	114.5	88	88
1937	86.4	57.7	56.5	150	153	114.0	122.2	121.6	93	94
1938	58.2	38.2	37.3	152	156	104.0	105.5	105.1	99	99
1939	77.0	46.5	45.5	166	169	111.7	110.0	108.2	102	103

For footnotes see pp. 351-52.

TABLE A-5—INDEXES (continued)

Year	Coal Mining Total				
	Output	Mandays of Employment	Manhours of Employment	Output per Manday	Output per Manhour
1899	45.5	60.6	..	75	..
1900	47.7	65.9	..	72	..
1901	52.3	72.7	..	72	..
1902	51.1	70.8	78.3	72	65
1903	63.0	86.2	93.9	73	67
1904	62.0	82.8	89.4	75	69
1905	68.7	91.9	99.3	75	69
1906	71.4	93.2	99.7	77	72
1907	83.0	108.6	117.1	76	71
1908	72.8	93.1	100.5	78	72
1909	79.5	103.2	111.3	77	71
1910	86.2	110.3	119.0	78	72
1911	86.1	109.7	118.5	78	73
1912	91.1	112.5	121.4	81	75
1913	97.4	123.1	132.9	79	73
1914	88.8	109.3	118.1	81	75
1915	91.3	106.3	114.8	86	80
1916	100.1	117.5	125.0	85	80
1917	110.7	131.8	134.6	84	82
1918	115.1	136.0	136.5	85	84
1919	94.6	112.6	112.4	84	84
1920	111.3	124.9	124.4	89	90
1921	87.3	98.5	98.1	89	89
1922	79.0	84.1	84.0	94	94
1923	111.2	116.4	116.2	96	96
1924	97.8	103.8	103.7	94	94
1925	93.7	99.7	99.8	94	94
1926	109.2	116.2	116.1	94	94
1927	100.1	104.5	104.5	96	96
1928	96.0	97.3	97.3	99	99
1929	100.0	100.0	100.0	100	100
1930	89.2	85.8	86.1	104	104
1931	74.0	67.8	68.2	109	109
1932	60.5	54.6	54.7	111	111
1933	63.4	61.5	61.5	103	103
1934	69.7	72.2	66.3	96	105
1935	69.7	70.8	63.4	99	110
1936	80.0	79.4	70.8	101	113
1937	79.9	78.7	69.0	102	116
1938	64.7	60.8	53.1	106	122
1939	72.8	66.4	57.9	110	126

For footnotes see pp. 351-52.

TABLE A-5—INDEXES (continued)

Year	COAL MINING (continued) PENNSYLVANIA ANTHRACITE Output	Man-days of Employment	Man-hours of Employment	Output per Man-day	Output per Man-hour	BITUMINOUS COAL Output	Man-days of Employment	Man-hours of Employment	Output per Man-day	Output per Man-hour
1899	81.8	70.8	..	116	..	36.1	57.5	..	63	..
1900	77.7	70.2	..	111	..	39.7	64.6	..	61	..
1901	91.4	83.5	99.2	109	92	42.2	69.4	..	61	..
1902	56.0	50.4	59.8	111	94	48.6	77.1	84.0	63	58
1903	101.1	90.9	102.3	111	99	52.9	84.8	91.3	62	58
1904	99.1	91.4	102.8	108	96	52.1	80.2	85.3	65	61
1905	105.2	104.3	117.3	101	90	58.9	88.1	93.8	67	63
1906	96.6	92.8	104.5	104	92	64.1	92.4	98.3	69	65
1907	116.0	107.9	121.4	107	96	73.8	108.8	115.8	68	64
1908	112.8	102.2	114.9	110	98	62.2	90.3	96.1	69	65
1909	109.8	104.3	117.4	105	94	71.0	102.9	109.5	69	65
1910	114.4	113.8	128.1	101	89	78.0	109.2	116.3	71	67
1911	122.5	124.5	140.1	98	87	75.9	105.1	111.9	72	68
1912	114.3	117.9	132.6	97	86	84.2	110.9	118.0	76	71
1913	124.0	132.5	149.0	94	83	89.4	120.2	128.0	74	70
1914	123.0	129.1	145.2	95	85	79.0	103.1	109.8	77	72
1915	120.5	119.0	133.8	101	90	82.8	102.3	108.9	81	76
1916	118.6	118.7	126.1	100	94	94.0	117.1	124.7	80	75
1917	134.9	128.8	128.8	105	105	103.2	132.8	136.4	78	76
1918	133.9	126.5	126.5	106	106	108.3	138.9	139.6	78	78
1919	119.3	120.5	120.5	99	99	87.1	110.2	109.9	79	79
1920	121.4	115.4	115.4	105	105	106.3	127.8	127.1	83	84
1921	122.6	126.6	126.6	97	97	77.7	89.8	89.4	87	87
1922	74.0	69.3	69.3	107	107	78.9	88.6	88.4	89	89
1923	126.4	123.8	123.8	102	102	105.5	114.1	113.9	92	93
1924	119.1	128.8	128.8	92	92	90.4	96.1	96.1	94	94
1925	83.7	85.4	85.4	98	98	97.2	104.2	104.2	93	93
1926	114.4	118.2	118.2	97	97	107.2	115.5	115.4	93	93
1927	108.5	109.1	109.1	99	99	96.8	103.0	103.0	94	94
1928	102.1	102.0	102.0	100	100	93.6	95.9	95.9	98	98
1929	100.0	100.0	100.0	100	100	100.0	100.0	100.0	100	100
1930	94.0	92.6	92.6	102	102	87.4	83.6	84.1	104	104
1931	80.8	76.0	76.4	106	106	71.4	65.3	65.7	109	109
1932	67.5	57.2	57.5	118	117	57.9	53.8	53.9	108	107
1933	67.1	55.8	55.8	120	120	62.4	63.3	63.3	99	99
1934	77.4	66.2	66.2	117	117	67.2	74.0	66.3	91	101
1935	70.6	57.2	57.1	124	124	69.6	75.0	65.3	93	107
1936	73.9	57.4	57.2	129	129	82.1	86.1	75.0	95	109
1937	70.2	55.0	49.8	128	141	83.3	86.1	74.9	97	111
1938	62.4	48.5	42.5	129	147	65.1	64.6	56.3	101	116
1939	69.7	50.0	43.9	140	159	73.5	71.5	62.2	103	118

For footnotes see pp. 351-52.

TABLE A-5—INDEXES (continued)

Year	Oil and Gas Wells[j]			Stone Quarrying[k] Total				
	Output	Manhours of Employment	Output per Manhour	Output	Mandays of Employment	Manhours of Employment	Output per Manday	Output per Manhour
1899	8.1	..	..	..	..	..	..	..
1900	9.0	..	..	..	..	..	..	..
1901	9.6	..	..	..	..	..	..	..
1902	11.1	28.7	39	..	..	..	..	..
1903	12.0	..	..	..	..	..	..	..
1904	13.0	..	..	..	..	..	..	..
1905	14.3	..	..	..	..	..	..	..
1906	14.2	..	..	62.9	..	..	..	..
1907	16.3	..	..	64.5	..	..	..	..
1908	16.8	..	..	62.2	..	..	..	..
1909	18.3	..	..	69.9	..	..	..	..
1910	20.1	..	..	73.0	..	..	..	..
1911	20.4	..	..	72.2	156.2	..	46	..
1912	21.4	..	..	72.6	164.1	..	44	..
1913	23.0	..	..	76.2	161.4	..	47	..
1914	24.0	..	..	70.4	130.2	..	54	..
1915	25.2	..	..	69.4	135.1	..	51	..
1916	27.9	..	..	73.5	122.7	..	60	..
1917	31.4	..	..	63.2	116.7	..	54	..
1918	32.5	..	..	48.6	95.3	..	51	..
1919	34.7	..	..	50.8	106.2	108.5	48	47
1920	40.3	..	..	59.0	124.7	..	47	..
1921	42.6	..	..	51.1	98.6	..	52	..
1922	50.0	..	..	64.1	110.3	..	58	..
1923	66.7	..	..	79.6	142.6	..	56	..
1924	66.6	..	..	80.9	143.7	..	56	..
1925	71.7	..	..	89.0	119.6	..	74	..
1926	74.0	..	..	91.6	113.1	..	81	..
1927	86.3	..	..	97.6	110.7	..	88	..
1928	87.8	..	..	97.2	106.0	..	92	..
1929	100.0	100.0	100	100.0	100.0	100.0	100	100
1930	91.3	..	..	89.1	89.4	87.6	100	102
1931	84.5	..	..	65.8	69.7	64.3	94	102
1932	77.4	..	..	44.5	48.8	44.6	91	100
1933	86.5	..	..	40.8	45.2	38.8	90	105
1934	88.4	..	..	46.4	48.2	39.8	96	117
1935	96.8	57.2	169	43.6	49.9	41.6	87	105
1936	106.9	70.5	152	63.7	62.5	54.1	102	118
1937	123.8	78.2	158	66.1	67.2	58.1	98	114
1938	118.2	78.2	151	57.2	55.7	47.4	103	121
1939	123.2	66.1	186	67.2	59.3	50.3	113	134

For footnotes see pp. 351-52.

TABLE A-5—INDEXES (continued)

Year	Stone Quarrying[k] (continued) — Dimension Stone: Output	Man-days of Employment	Man-hours of Employment	Output per Man-day	Output per Man-hour	Nondimension Stone: Output	Man-days of Employment	Man-hours of Employment	Output per Man-day	Output per Man-hour
1899	..	..	..	..	..	..	..	..	..	..
1900	..	..	..	..	..	..	..	..	..	..
1901	..	..	..	..	..	..	..	..	..	..
1902	..	..	..	..	..	..	..	..	..	..
1903	..	..	..	..	..	..	..	..	..	..
1904	..	..	..	..	..	..	..	..	..	..
1905	..	..	..	..	..	..	..	..	..	..
1906	111.0	..	..	..	..	41.2	..	..	..	..
1907	106.8	..	..	..	..	46.3	..	..	..	..
1908	112.6	..	..	..	..	39.4	..	..	..	..
1909	117.3	..	..	..	..	49.2	..	..	..	..
1910	110.0	..	..	..	..	57.2	..	..	..	..
1911	107.5	..	..	..	..	57.1	..	..	..	..
1912	101.3	..	..	..	..	60.9	..	..	..	..
1913	100.3	..	..	..	..	66.9	..	..	..	..
1914	97.3	..	..	..	..	59.2	..	..	..	..
1915	87.0	..	..	..	..	63.0	..	..	..	..
1916	95.6	..	..	..	..	64.9	..	..	..	..
1917	71.5	..	..	..	..	59.6	..	..	..	..
1918	47.0	..	..	..	..	48.6	..	..	..	..
1919	59.5	..	..	..	..	47.1	..	..	..	..
1920	64.0	..	..	..	..	56.6	..	..	..	..
1921	61.8	..	..	..	..	46.6	..	..	..	..
1922	75.5	110.1	..	69	..	59.1	110.4	..	54	..
1923	91.8	136.2	..	67	..	74.2	144.8	..	51	..
1924	93.8	158.4	..	59	..	75.1	138.7	..	54	..
1925	100.2	125.3	..	80	..	83.9	117.7	..	71	..
1926	95.6	114.3	..	84	..	89.7	112.7	..	80	..
1927	98.5	108.2	..	91	..	97.2	111.6	..	87	..
1928	98.7	107.3	..	92	..	96.4	105.5	..	91	..
1929	100.0	100.0*	100.0	100	100	100.0	100.0	100.0	100	100
1930	88.5	85.5	84.6	104	104	89.3	90.4	88.3	99	101
1931	60.2	57.5	54.4	105	111	68.4	72.7	66.6	94	103
1932	40.6	34.1	31.5	119	129	46.0	52.4	47.7	88	96
1933	31.1	31.2	27.5	100	113	45.8	48.7	41.5	94	110
1934	29.1	25.9	21.3	112	137	55.3	53.7	44.2	103	125
1935	29.5	31.4	26.9	94	109	50.8	54.5	45.1	93	113
1936	40.5	43.3	38.4	93	105	75.7	67.2	57.8	113	131
1937	42.7	48.7	44.1	88	97	78.0	71.7	61.4	109	127
1938	40.1	41.8	37.5	96	107	66.0	59.2	49.8	112	133
1939	48.8	46.2	41.1	106	119	76.8	62.6	52.5	123	146

For footnotes see pp. 351-52.

TABLE A-5—INDEXES (concluded)

Year	Gypsum					Phosphate Rock				
	Output	Man-days of Employment	Man-hours of Employment	Output per Man-day	Output per Man-hour	Output	Man-days of Employment	Man-hours of Employment	Output per Man-day	Output per Man-hour
1899	9.7	..	..	..	..	40.0	..	..	..	..
1900	11.8	..	..	..	..	44.9	..	..	..	..
1901	12.6	..	..	..	..	38.0	..	..	..	..
1902	16.3	47.4	53.6	34	30	39.6	197.1	198.0	20	20
1903	20.8	..	..	..	..	42.7	..	..	..	..
1904	18.8	..	..	..	..	52.6	..	..	..	..
1905	20.8	..	..	..	..	56.5	..	..	..	..
1906	30.7	..	..	..	..	52.8	..	..	..	..
1907	34.9	..	..	..	..	62.5	..	..	..	..
1908	34.3	..	..	..	..	70.3	..	..	..	..
1909	44.9	..	..	..	..	64.5	..	..	..	..
1910	47.4	..	..	..	..	69.4	..	..	..	..
1911	46.3	80.2	87.3	58	53	81.9	..	..	..	..
1912	49.9	..	..	..	..	84.2	..	..	..	..
1913	51.8	..	..	..	..	83.2	..	..	..	..
1914	49.4	..	..	..	..	70.0	..	..	..	..
1915	48.8	..	..	..	..	51.1	..	..	..	..
1916	55.0	83.5	90.3	66	61	57.3	..	..	..	..
1917	53.8	..	..	..	..	75.3	..	..	..	..
1918	41.0	..	..	..	..	60.3	..	..	..	..
1919	48.2	82.3	90.6	59	53	48.9	119.2	117.7	41	42
1920	62.4	97.8	106.2	64	59	105.0	219.7	217.4	48	48
1921	57.6	84.9	93.3	68	62	64.1	125.6	123.9	51	52
1922	75.4	109.8	121.4	69	62	61.7	95.8	95.2	64	65
1923	94.8	129.5	143.0	73	66	77.7	98.7	97.6	79	80
1924	100.5	140.0	154.5	72	65	75.1	112.6	110.7	67	68
1925	113.2	159.0	160.6	71	70	85.9	106.5	103.9	81	83
1926	112.3	149.9	147.5	75	76	94.8	101.4	100.5	93	94
1927	106.6	131.6	128.1	81	83	82.6	96.6	95.6	85	86
1928	101.7	117.6	115.2	86	88	93.0	96.9	97.0	96	96
1929	100.0	100.0	100.0	100	100	100.0	100.0	100.0	100	100
1930	69.2	62.5	60.3	111	115	106.6	99.9	101.2	107	105
1931	51.0	52.2	49.9	98	102	70.4	65.5	63.0	108	112
1932	28.2	26.8	24.4	105	116	44.8	40.5	37.8	111	118
1933	26.6	28.6	25.7	93	104	62.3	55.0	48.9	113	127
1934	30.6	35.6	30.8	86	99	76.5	74.0	62.2	103	123
1935	38.0	37.6	33.9	101	112	83.4	80.7	69.0	103	121
1936	54.1	53.7	47.8	101	113	91.4	94.1	81.5	97	112
1937	61.0	56.9	51.3	107	119	112.5	101.9	86.0	110	131
1938	53.5	46.4	41.7	115	128	101.9	89.0	72.5	114	141
1939	64.3	59.9	53.5	107	120	105.3	88.2	69.5	119	152

For footnotes see pp. 351-52.

[a] The indexes of output shown in this table were computed from data in Tables A-1 and A-2 after the fashion described at the beginning of this appendix. They are set up on an industry rather than a product basis (a distinction important only in the case of nonferrous metals), and include only those industries for which both output and employment data are available. More comprehensive output indexes (especially for industries omitted from this table owing to absence of employment data), and indexes on a product basis (in the case of nonferrous metals), will be found in Table A-7.

[b] The indexes of employment, in terms of mandays and of manhours, are computed from the data in Table A-3.

[c] The indexes of productivity (output per manday and output per manhour) are obtained in every case by dividing the index of output by the corresponding index of employment—and multiplying by 100. This operation implies a degree of comparability between our measures of output and employment which unfortunately cannot be taken for granted. The results are probably most reliable in the case of iron ore and coal mining. The data on productivity in copper mining and other nonferrous metals appear to be somewhat less satisfactory, owing to uncertainties in measuring both output and employment. Least securely founded, perhaps, are the indexes for oil and gas wells (owing to uncertainties of employment coverage), and for stone quarrying (in which both output and employment are difficult to measure). For further details the reader is referred to the notes to Tables A-1 and A-3 in this appendix; and to Appendices B, C and D.

[d] Includes all industries shown in this table, i.e., those numbered (1) through (5), (7) through (16), (19), (21) and (22) in Table A-1. Excluded are: the stone industries prior to 1906 for lack of output data; the placer mining of gold and silver, and numerous minor nonmetals, for lack of employment data.

[e] Includes all industries shown in this table except oil and gas wells.

[f] Combination of iron ore, copper, and other nonferrous metal mining. Does not include placer gold mining; includes pyrites and the production of fluorspar in Illinois and Kentucky.

[g] For these years mandays of employment at beneficiating plants are not available; the index is extrapolated by means of data for the mining section of the industry only. See notes to Table A-3.

[h] The indexes are for the copper mining industry—(3) in Table A-1—and not for the product "copper": for further explanation, see Appendix B. Some doubts arise concerning the reliability of the indexes of productivity obtained for this industry. Changes may have occurred in the quality of the product (ore or concentrates) which are not reflected in our output index (see Appendix D); also, the segregation of employment between milling (included) and smelting (excluded) is somewhat artificial (see notes to Table A-3).

[i] Includes the industries numbered (2), (4), (5), (7) through (11), and (21) in Table A-1. Indexes for output, employment and productivity for two constituents of this group, lead and zinc mining in the Mississippi Valley and mercury mining, will be found in Table A-6. The data for this industry are weakened by some uncertainties of coverage. In particular, numerous minor nonferrous metals are included in the output index whose coverage in the employment statistics may be more ostensible than real. In 1902 correction was made for undercoverage of employment data at small lead and zinc and gold and silver mines (see notes to Table A-3).

[j] Manhours at oil and gas wells refer to wage earners only. The series shown for output includes petroleum, natural gas and natural gasoline. Output data for this industry appear to be satisfactory, but employment figures leave much to be desired. As explained in notes to Table A-3, employment given by contractors was canvassed only in 1902 and in 1939; the 1902 canvass was probably defective. The reader should note, however, that if employment in 1902 is understated, the rise in productivity was even greater than that reported in the table.

[k] After 1929 noncommercial production of crushed stone, for which we have no employment data, is excluded. If this production is included, the output indexes for total and crushed, or nondimension, stone read as follows:

Footnotes to Table A-5 continued on next page.

Footnotes to Table A-5, concluded.

	Total	*Nondimension*
1929	100.0	100.0
1930	89.6	89.9
1931	67.1	70.2
1932	47.1	49.8
1933	43.2	49.0
1934	52.2	63.6
1935	49.1	58.6
1936	74.7	91.5
1937	76.4	92.8
1938	71.1	86.2
1939	84.8	102.4

The indexes of productivity in stone quarrying are among the least satisfactory we have, because of the problem of weighting different kinds of dimension stone which vary greatly in unit value; the difficulty of excluding employment in stone dressing establishments; and undercoverage of the employment data, especially for crushed stone. For further comment on these matters, see Appendix C.

TABLE A-6

LEAD AND ZINC, AND MERCURY MINING

Indexes of Output, Employment and Productivity[a]

1929:100

Year	Lead and Zinc Mining, Mississippi Valley[b]					Mercury Mining[c]				
	Output	Man-days of Employment	Man-hours of Employment	Output per Man-day	Output per Man-hour	Output	Man-days of Employment	Man-hours of Employment	Output per Man-day	Output per Man-hour
1902	..	..	..	..	..	145.8	138.3	162.5	105	90
1911	55.6	117.0	..	47	..	88.6	..	..	..	..
1912	59.1	138.3	..	43	..	104.4	..	..	..	..
1913	57.6	117.9	..	49	..	84.2	..	..	..	..
1914	58.3	101.6	..	57	..	69.0	..	..	..	..
1915	71.5	122.5	..	58	..	87.6	..	..	..	..
1916	86.8	198.9	..	44	..	124.7	..	..	..	..
1917	98.6	182.5	..	54	..	150.7	127.4	..	118	..
1918	95.4	128.6	..	74	..	137.0	..	..	..	..
1919	90.0	119.5	..	75	..	89.2	..	..	..	..
1920	97.9	120.6	..	81	..	55.8	..	..	..	..
1921	66.1	59.6	..	111	..	26.4	..	..	..	..
1922	93.0	91.4	..	102	..	26.6	..	..	..	..
1923	103.3	108.3	..	95	..	33.1	..	..	..	..
1924	111.4	135.1	..	82	..	42.0	37.8	37.4	111	112
1925	122.4	132.0	..	93	..	38.2	33.0	32.7	116	117
1926	122.8	140.0	..	88	..	31.8	34.6	34.2	92	93
1927	104.5	116.1	..	90	..	47.0	61.6	60.9	76	77
1928	96.5	95.0	..	102	..	75.5	79.1	79.2	95	95
1929	100.0	100.0	100.0	100	100	100.0	100.0	100.0	100	100
1930	77.2	67.1	67.2	115	115	91.0	87.4	93.3	104	98
1931	50.8	42.8	42.9	119	118	105.3	91.1	92.0	116	114
1932	37.3	25.0	25.1	149	149	53.3	37.6	37.2	142	143
1933	42.6	25.7	25.7	166	166	40.8	33.4	32.8	122	124
1934	46.3	36.0	35.6	129	130	65.2	43.6	40.4	150	161
1935	56.3	43.6	43.5	129	129	74.0	49.2	46.6	150	159
1936	65.9	56.0	55.9	118	118	70.0	..	..	..	..
1937	75.9	67.0	66.7	113	114	69.7	..	..	..	..
1938	58.7	48.6	48.0	121	122	76.0	..	..	..	..
1939	73.2	57.2	56.5	128	130	78.7	55.2	53.5	143	147

[a] Data in this table are included in, but do not exhaust, the category "Metal mining and ore dressing—other nonferrous metals" in Table A-5. The indexes of output were computed from data in Tables A-1 and A-2 after the fashion described at the beginning of the appendix. The indexes of employment are derived from Table A-4.

[b] Arkansas, Illinois, Iowa, Kansas, Kentucky, Missouri, Oklahoma, Tennessee, Wisconsin. Includes fluorspar mining in Illinois and Kentucky. Employment data cover mining alone and do not include milling.

[c] Employment at recovery plants is included.

TABLE A-7

GROUPS AND INDIVIDUAL MINERALS

Indexes of Output[a]

1929:100

Year	*Total Mining*[b]	*Metals*[c]	*Fuels*[d]	*Other Nonmetals*[e]	*Copper, Lead and Zinc*	*Copper*	*Lead*
1899	25.7	39.7	23.0	19.7	27.9	29.2	32.0
1900	27.8	43.4	24.5	21.3	30.4	31.1	41.4
1901	29.4	44.0	26.8	20.7	30.5	30.9	41.0
1902	30.6	47.7	27.1	22.8	33.2	33.8	42.4
1903	34.5	47.7	32.5	25.3	34.9	35.7	44.5
1904	35.4	49.7	32.8	29.4	40.0	41.6	47.2
1905	39.6	56.1	36.2	36.3	43.3	45.3	48.8
1906	41.2	59.1	37.3	43.7	44.7	46.6	53.3
1907	44.6	57.7	43.3	45.5	42.9	43.0	55.9
1908	41.6	55.3	39.5	44.0	45.7	48.7	50.6
1909	47.4	67.7	43.1	50.3	54.4	57.4	59.0
1910	50.2	69.4	46.8	52.0	53.7	55.5	58.6
1911	49.4	66.0	47.0	51.5	55.0	55.6	65.3
1912	53.0	73.2	49.6	54.8	61.3	62.4	67.7
1913	55.9	76.3	53.0	55.4	62.6	62.1	74.0
1914	52.1	68.5	50.3	50.8	60.0	57.7	77.3
1915	56.7	84.3	52.1	49.9	75.6	71.7	83.0
1916	65.4	105.0	57.2	54.9	96.0	96.5	92.0
1917	69.0	102.9	63.6	55.5	94.2	92.4	96.1
1918	69.4	99.1	66.0	48.3	92.0	94.2	86.1
1919	60.1	73.3	59.6	46.4	63.5	59.6	65.7
1920	69.8	77.5	70.3	56.8	65.9	59.0	76.0
1921	57.2	39.3	61.6	48.7	30.7	20.9	63.4
1922	61.5	61.5	61.9	59.2	54.0	45.4	73.1
1923	84.8	85.1	86.1	75.6	75.6	71.2	83.8
1924	79.8	82.3	79.8	76.1	82.1	78.4	91.2
1925	82.7	89.9	81.1	83.3	89.3	82.1	104.7
1926	89.6	93.5	89.0	88.2	92.7	84.8	104.7
1927	91.9	88.7	92.3	93.6	88.6	81.6	101.8
1928	91.8	91.4	91.4	95.1	92.5	90.5	96.9
1929	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1930	88.4	78.4	90.5	90.4	75.2	70.5	85.3
1931	73.6	54.0	79.6	67.8	55.4	53.0	61.7
1932	59.2	30.2	69.3	43.6	30.9	23.9	44.7
1933	64.2	35.0	75.4	43.9	31.1	19.5	41.6
1934	69.7	44.2	79.8	49.4	36.1	24.3	43.9
1935	75.4	57.4	84.1	52.2	48.0	38.1	50.6
1936	88.5	77.4	94.5	71.4	64.4	61.0	57.0
1937	99.6	99.7	103.4	78.0	82.5	84.4	71.1
1938	85.3	70.0	92.7	66.9	59.4	55.6	56.5
1939	94.3	89.0	99.1	75.3	74.1	74.5	63.3

[a] This table provides output indexes additional to those given in Tables A-5 and A-6. All data in this table are derived from Tables A-1 and A-2. In the case of many series shown, comparable employment data are not available. Indexes of output comparable with employment will be found in Tables A-5 and A-6.

[b] Includes all items shown in Table A-1.

[c] Gold, silver, copper, lead, zinc, iron ore, manganese, tungsten, molybdenum, mercury, bauxite. For separate indexes of copper, lead, zinc, gold, silver and manganese, see columns to right. For iron ore, see Table A-5.

Zinc	*Gold*	*Silver*	*Manganese*	*Petroleum*	*Natural Gas*	*Sand and Gravel*[f]	*Clay*[g]
20.1	192.6	93.6	12.7	8.7	11.6	..	12.0
19.3	206.3	99.6	24.4	9.8	12.4	..	17.0
22.0	209.0	95.8	29.9	10.4	13.8	..	19.2
24.5	208.7	95.6	21.2	12.4	14.7	..	23.8
24.9	192.1	93.0	19.0	13.4	15.5	..	27.5
29.1	206.0	92.4	12.4	14.9	16.2	..	26.0
31.8	208.4	93.0	13.4	16.1	18.3	12.1	30.1
31.2	216.0	94.7	11.2	15.3	20.3	16.9	33.3
34.9	195.5	86.7	11.2	18.2	21.2	21.1	34.7
32.3	208.0	84.0	7.2	19.2	21.0	18.7	27.8
41.7	226.4	94.7	6.6	20.0	25.1	29.5	34.3
44.8	226.0	95.1	6.1	22.4	26.6	33.6	38.1
45.8	229.9	100.4	4.7	23.1	26.8	33.0	36.3
53.2	216.0	108.5	4.7	23.7	29.3	33.4	40.5
57.1	211.2	117.3	7.6	26.0	30.3	38.4	42.9
57.4	217.1	114.6	9.7	27.2	30.9	38.2	37.6
81.2	234.4	118.0	20.3	28.5	32.8	36.8	40.1
97.1	212.8	128.3	54.5	30.2	39.3	42.6	51.2
98.5	189.5	115.0	125.4	33.4	41.5	37.1	54.6
87.8	163.6	111.3	231.6	35.3	37.6	30.0	52.5
75.8	136.5	84.9	56.9	37.6	38.9	34.0	44.0
81.1	117.5	92.0	106.2	44.0	41.6	39.7	59.3
35.4	116.1	75.5	9.0	46.9	34.5	38.2	37.4
65.2	114.9	100.2	44.8	55.3	39.8	45.8	55.8
84.3	125.6	115.2	105.1	72.7	52.5	67.0	69.3
88.1	127.1	105.0	85.1	70.9	59.5	74.3	74.2
98.1	118.8	109.3	140.4	75.8	62.0	80.5	83.0
106.9	113.3	102.3	101.7	76.5	68.5	85.5	86.2
99.2	108.1	97.7	108.0	89.5	75.4	92.0	87.7
96.0	107.9	95.1	92.1	89.5	81.8	96.9	93.0
100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
82.2	102.7	78.4	81.7	89.1	101.3	85.7	95.4
56.6	104.8	48.9	39.2	84.5	87.9	62.6	68.5
39.4	109.1	37.3	10.2	77.9	81.1	41.4	43.2
53.0	109.0	38.0	20.6	89.9	81.1	32.0	51.8
60.6	133.1	54.0	26.3	90.1	92.3	36.5	57.5
71.5	164.4	79.9	46.1	98.9	99.9	41.0	72.7
79.4	192.6	100.5	72.8	109.2	113.0	58.1	89.3
86.5	207.2	117.4	101.4	127.0	125.5	60.7	98.6
71.3	214.0	101.4	32.2	120.6	119.7	51.2	68.3
80.6	237.4	106.3	63.5	125.6	129.2	57.5	89.6

[d] Pennsylvania anthracite, bituminous coal, petroleum, natural gas and natural gasoline. For breakdown, see columns to right and Table A-5.

[e] Asbestos, asphalt, barite, borates, bromine, fluorspar, tripoli, garnet, pumice, ground sand, sand, gravel, sodium salts, calcium chloride, abrasive sandstone, clay, fuller's earth, stone (dimension and nondimension), talc, gypsum, pyrites, sulfur, mica, potash, magnesite, other magnesium compounds, graphite, feldspar, phosphate rock. Indexes for stone, gypsum and phosphate rock will be found in Table A-5.

[f] For 1923–39 the series covers commercial production only.

[g] Does not include common clay.

TABLE A-8

COPPER, LEAD AND ZINC: SECONDARY OUTPUT, 1907-39[a]

Thousand short tons

Year	Copper			Lead	Zinc[b]
	New	Old	Total		
1907	..	..	30	26	..
1908	..	..	12	18	..
1909	..	..	45	42	42
1910	..	..	94	55	62
1911	..	..	107	54	68
1912	..	..	138	67	85
1913	..	..	136	73	80
1914	..	..	128	61	72
1915	..	..	196	79	93
1916	..	..	350	96	114
1917	..	..	383	94	116
1918	176	177	353	97	121
1919	135	153	287	122	108
1920	143	169	312	125	116
1921	85	132	217	104	78
1922	133	203	336	160	140
1923	140	271	411	194	139
1924	122	266	388	204	132
1925	129	291	420	227	128
1926	143	337	480	277	141
1927	151	339	490	276	140
1928	171	365	536	309	149
1929	222	404	627	311	143
1930	125	342	467	256	99
1931	86	261	347	235	72
1932	67	181	248	198	48
1933	78	260	338	224	88
1934	66	311	377	208	66
1935	87	362	449	270	94
1936	102	383	485	263	122
1937	123	409	532	275	127
1938	93	267	360	225	87
1939	213	287	500	242	135

[a] All data are from U. S. Bureau of Mines, *Minerals Yearbook,* or its predecessor *Mineral Resources.*

[b] Amount recovered as metal or in alloys; does not include zinc recovered in chemical products.

TABLE A-9

BITUMINOUS COAL: UNDERGROUND AND OPEN PIT MINES, 1914–36[a]

Output, Employment and Productivity

	Underground Mines			*Open Pit Mines*			*All Mines*		
Year	Output[b] (thous. tons)	Employment, Mandays[b] (thous.)	Output per Manday (tons)	Output[c] (thous. tons)	Employment, Mandays[d] (thous.)	Output per Manday[e] (tons)	Output[f] (thous. tons)	Employment, Mandays[g] (thous.)	Output per Manday (tons)
1914	421,423	113,531	3.71	1,281	253	5.06	422,704	113,784	3.71
1915	439,791	112,441	3.91	2,832	478	5.93	442,623	112,919	3.92
1916	498,626	128,618	3.88	3,881	625	6.21	502,507	129,243	3.89
1917	546,253	145,500	3.75	5,484	999	5.49	551,737	146,499	3.77
1918	571,361	151,831	3.76	7,949	1,456	5.46	579,310	153,287	3.78
1919	460,413	120,569	3.82	5,386	974	5.53	465,799	121,543	3.83
1920	560,430	139,619	4.01	8,176	1,358	6.02	568,606	140,977	4.03
1921	411,239	98,482	4.18	4,606	630	7.31	415,845	99,112	4.20
1922	412,891	96,456	4.28	9,298	1,361	6.83	422,189	97,817	4.32
1923	553,358	124,468	4.45	11,087	1,478	7.50	564,445	125,946	4.48
1924	470,403	104,517	4.50	13,184	1,500	8.79	483,587	106,017	4.56
1925	503,473	113,371	4.44	16,497	1,550	10.64	519,970	114,921	4.52
1926	557,197	125,785	4.43	16,083	1,702	9.45	573,280	127,487	4.50
1927	499,792	111,878	4.47	17,867	1,792	9.97	517,659	113,670	4.55
1928	481,488	104,086	4.63	19,131	1,698	11.27	500,619	105,784	4.73
1929	515,121	108,822	4.73	19,767	1,519	13.01	534,888	110,341	4.85
1930	448,468	90,941	4.93	18,938	1,360	13.92	467,406	92,301	5.06
1931	363,459	70,881	5.13	18,524	1,174	15.78	381,983	72,055	5.30
1932	290,148	58,121	4.99	19,459	1,242	15.67	309,607	59,363	5.22
1933	315,470	68,425	4.61	18,065	1,415	12.77	333,535	69,840	4.78
1934	338,791	80,014	4.23	20,469	1,690	12.11	359,260	81,704	4.40
1935	348,987	80,703	4.32	23,267	2,076	11.21	372,254	82,779	4.50
1936	411,472	92,871	4.43	27,479	2,181	12.60	438,951	95,052	4.62

[a] This table underlies the discussion of Chapter 8 and contains material on which Chart 38 is based. No output was recorded from open pit mines prior to 1914. Figures for 1937 and later years not available. Tons are short tons.

[b] By difference.

[c] Willard E. Hotchkiss and others, *Bituminous-Coal Mining* (National Research Project, Philadelphia, 1939), Vol. I, p. 106.

[d] Derived from adjacent columns.

[e] Hotchkiss and others, *op. cit.*, Vol. II, p. 366.

[f] Table A-1.

[g] Table A-3.

TABLE A-10

COPPER MINING: UNDERGROUND AND OPEN PIT MINES, 1914–36[a]

Output, Employment and Productivity

Year	*Underground Mines*			*Open Pit Mines*			*All Mines*		
	Output, Recoverable Content (mil. lb.)	Employment, Mandays (mil.)	Output per Manday (lb.)	Output, Recoverable Content (mil. lb.)	Employment, Mandays (mil.)	Output per Manday (lb.)	Output, Recoverable Content (mil. lb.)	Employment, Mandays (mil.)	Output per Manday (lb.)
1914	909	11.64	78	223	1.21	185	1,132	12.85	88
1915	1,175	12.98	91	281	1.24	226	1,456	14.22	102
1916	1,630	17.61	93	358	1.32	270	1,988	18.93	105
1917	1,507	17.61	86	386	1.48	261	1,893	19.09	99
1918	1,517	17.61	86	393	1.50	263	1,910	19.10	100
1919	979	10.90	90	231	.957	241	1,210	11.86	102
1920	975	10.25	95	237	.934	253	1,212	11.18	108
1921	390	4.28	91	64.1	.184	349	454	4.46	102
1922	765	7.14	107	162	.363	445	927	7.50	124
1923	1,036	9.11	114	352	1.19	295	1,388	10.31	135
1924	1,115	8.83	126	415	1.40	297	1,531	10.23	150
1925	1,175	8.82	133	425	1.60	265	1,600	10.42	154
1926	1,143	8.90	128	479	1.61	297	1,622	10.51	154
1927	1,089	8.28	131	461	1.34	343	1,550	9.63	161
1928	1,139	8.40	136	552	1.51	367	1,691	9.90	171
1929	1,279	10.27	125	561	1.71	328	1,840	11.98	154
1930	1,003	7.18	140	339	1.07	319	1,343	8.25	163
1931	757	4.35	174	292	.729	401	1,049	5.08	207
1932	352	1.95	180	122	.341	358	474	2.29	207
1933	258	1.41	183	120	.281	425	377	1.69	224
1934	298	1.46	204	172	.381	452	470	1.84	255
1935	438	2.33	188	251	.455	551	689	2.79	247
1936	677	3.61	187	452	.740	612	1,129	4.35	259

[a] This table underlies the discussion of Chapter 12 and contains material on which Charts 38 and 46 are based. Data are from Y. S. Leong and others, *Copper Mining* (National Research Project, Philadelphia, 1940), pp. 252-53. Owing to difficulty of segregation, figures for output and employment at open pit mines are minimum estimates, for figures for underground mines contain some open pit output and employment. However, figures for output and employment are comparable as shown. Data for other years are not available. Since this table covers mining only and does not include ore dressing, figures for employment run lower than in Table A-3.

TABLE A-11

COPPER: CONSUMPTION BY USE, 1919–40[a]

Thousand short tons

Year	*Electrical Industries*[b]	*Automobiles*[c]	*Buildings*	*Manufactures for Export*	*Other Uses*[d]	*Total*
1919	246	49	31	100	196	621
1920	306	61	34	107	176	684
1921	246	48	22	49	95	460
1922	285	75	37	48	94	539
1923	397	105	38	53	145	738
1924	434	95	40	55	142	766
1925	458	108	47	58	170	840
1926	513	104	50	51	191	910
1927	473	101	53	57	178	862
1928	542	127	62	67	192	991
1929	674	138	59	75	214	1,160
1930	580	87	50	71	168	956
1931	382	62	45	48	113	650
1932	203	32	29	23	81	368
1933	198	49	36	16	116	415
1934	208	63	36	26	131	463
1935	266	95	49	30	136	575
1936	376	108	71	32	162	749
1937	460	112	70	45	172	860
1938	323	55	68	39	124	608
1939	413	85	89	52	162	801
1940	522	103	102	148	195	1,070

[a] See Chart 14. For 1919–26, annual issues for the years 1926 to 1930 of the *Yearbook* of the American Bureau of Metal Statistics. For 1927–31, *Mineral Resources, 1931*, Vol. I, p. 599. For 1932–40, annual issues of *Minerals Yearbook*. Data not available prior to 1919. Figures are for total consumption, whether of primary or of secondary origin.

[b] Electrical manufactures (generators, motors, electric locomotives, switchboards, light bulbs, etc.), telephones and telegraphs, light and power lines (transmission and distribution wire and bus bars), other wire, radio receiving sets.

[c] Does not include starter, generator and transmission equipment.

[d] Wire cloth, ammunition, castings (bearings, bushings, lubricators, valves and fittings), clocks and watches, coinage, copper-bearing steel, fire-fighting apparatus, radiators, railway equipment, refrigerators, shipbuilding, washing machines, water heaters, other uses.

TABLE A-12

LEAD: CONSUMPTION BY USE, 1919–40[a]

Thousand short tons

Year	Storage Batteries	Cable Coverings	Buildings	White Lead, Red Lead and Litharge[b]	Other Uses[c]	Total
1919	100	53	68	143	184	548
1920	108	79	71	162	185	605
1921	87	67	48	160	159	521
1922	130	93	71	186	203	683
1923	143	131	75	176	243	768
1924	170	138	83	184	237	812
1925	180	156	88	173	259	856
1926	190	185	94	156	276	901
1927	175	161	88	164	253	841
1928	220	180	96	154	281	931
1929	210	220	96	150	297	972
1930	163	208	67	116	215	769
1931	157	117	40	96	158	568
1932	138	56	22	86	115	417
1933	147	31	26	97	148	450
1934	163	35	30	106	153	488
1935	175	39	32	128	166	539
1936	191	61	40	140	202	634
1937	192	90	45	143	209	679
1938	167	60	36	114	169	546
1939	198	74	50	132	212	667
1940	220	107	65	125	264	782

[a] See Chart 15. For 1919, the *Yearbook* for 1927 of the American Bureau of Metal Statistics. For 1920–40, annual issues of *Mineral Resources*, and its successor *Minerals Yearbook*. Data not available prior to 1919. Figures include antimonial lead, and are for total consumption, whether of primary or of secondary origin.

[b] Used chiefly for pigments.

[c] Includes automobiles, railway equipment, shipbuilding, ammunition, terneplate, foil, bearing metal, solder, type metal, calking, castings, tetrethyl lead for motor fuel, and other uses.

TABLE A-13

ZINC: CONSUMPTION BY USE, 1908–40

Thousand short tons

Year	*Galvanizing*	*Brassmaking*	*Rolled Zinc*	*Other Uses*[b]	*Total*
1908	119	33	27	12	192
1909	164	48	33	17	262
1910	162	54	30	24	270
1916	200	175	48	28	450
1917	190	170	57	28	445
1919	163	155	55	29	402
1920	192	144	53	35	424
1921	138	75	30	19	262
1922	205	145	54	36	440
1923	235	175	56	49	515
1924	240	155	61	56	512
1925	283	165	71	60	579
1926	290	180	86	66	622
1927	280	160	74	69	583
1928	291	174	74	88	626
1929	290	185	68	91	634
1930	217	120	51	62	451
1931	168	98	49	55	370
1932	109	66	40	44	259
1933	148	94	41	67	350
1934	152	98	41	69	360
1935	195	124	56	98	473
1936	242	165	55	120	582
1937	256	169	58	127	610
1938	198	102	46	75	421
1939	275	175	62	114	626
1940	287	232	58	142	719

[a] See Chart 16. All data from annual issues of *Mineral Resources* and its successor *Minerals Yearbook*. Data not available prior to 1919 except for years shown. Figures are for total consumption, whether of primary or of secondary origin.

[b] Includes die castings; and slab zinc used for the manufacture of French oxide, zinc for wet batteries, castings and the desilverization of lead.

TABLE A-14

BITUMINOUS COAL: CONSUMPTION BY USE, 1917–40[a]
Million short tons

Year	*Electric Utilities*[b]	*Locomotive Fuel*[c]	*Byproduct Coke*	*Beehive Coke*	*All Other Domestic Uses*[d]	*Exports*	*Total*
1917	34	133	32	52	279	24	553
1918	34	134	37	48	277	22	553
1919	35	120	36	30	261	20	502
1920	37	135	44	32	260	39	547
1921	32	108	29	8	215	23	415
1922	34	113	41	13	225	12	439
1923	39	131	54	30	264	21	540
1924	38	117	49	16	264	17	501
1925	40	118	57	17	267	17	517
1926	41	123	64	19	286	35	568
1927	42	116	63	11	268	18	518
1928	41	112	70	7	268	16	515
1929	45	114	77	10	274	17	537
1930	43	98	66	4	244	16	471
1931	39	82	47	2	203	12	384
1932	30	66	31	1	178	9	316
1933	31	66	39	1	185	9	331
1934	34	70	44	2	197	11	358
1935	35	71	49	1	204	10	370
1936	42	81	63	3	234	11	433
1937	45	83	70	5	227	13	442
1938	40	69	45	1	189	10	355
1939	46	74	61	2	194	12	390
1940	53	79	77	5	217	16	447

[a] See Chart 21. All data from *Mineral Resources,* and its successor *Minerals Yearbook.* Data not available prior to 1917.

[b] Represents all coal consumed by public utility power plants in power generation, including a small amount of anthracite.

[c] Class I railroads only; excludes switching and terminal companies.

[d] Includes colliery fuel, bunker coal, manufacturing, domestic and miscellaneous uses.

TABLE A-15

PETROLEUM: OUTPUT OF PRINCIPAL REFINED PRODUCTS, 1917–40[a]

Million barrels of 42 gallons

Year	*Gasoline*	*Fuel Oil*[b]	*Kerosene*	*Lubricants*
1917	68	155	41	18
1918	85	174	43	20
1919	94	182	56	20
1920	116	211	55	25
1921	123	230	46	21
1922	148	255	55	23
1923	180	287	56	26
1924	213	320	60	27
1925	260	365	60	31
1926	303	365	62	32
1927	334	393	56	32
1928	381	427	59	35
1929	439	449	56	34
1930	441	372	49	34
1931	437	337	42	27
1932	400	301	44	22
1933	408	316	49	24
1934	424	335	54	26
1935	468	360	56	28
1936	516	414	56	31
1937	572	459	65	35
1938	569	447	65	31
1939	611	468	69	35
1940	616	500	74	37

[a] See Chart 22. All data from *Mineral Resources,* and its successor *Minerals Yearbook.* Data not available prior to 1917. Other products not listed are wax and coke.
[b] Includes gas oil.

TABLE A-16

DIMENSION STONE OUTPUT AND BUILDING CONSTRUCTION, 1915–39[a]

Year	*Dimension Stone Output*[b] (1915:100)	*Value of Building Construction, Current Prices*[c] ($ mil.)	*Building Costs*[d] (1913:100)	*Physical Volume of Building Construction*[e] (1915:100)
1915	100	1,646	95.3	100
1916	109.9	1,976	130.9	87.4
1917	82.2	1,867	166.8	64.8
1918	54.0	1,606	159.1	58.4
1919	68.4	2,841	158.8	103.6
1920	73.6	3,675	207.2	102.7
1921	71.0	3,508	166.1	122.3
1922	86.9	4,724	154.9	176.6
1923	105.6	5,861	186.0	182.5
1924	107.8	6,402	185.8	199.5
1925	115.3	7,170	182.7	227.2
1926	109.9	7,650	185.0	239.4
1927	113.2	7,366	186.1	229.2
1928	113.5	7,092	188.0	218.4
1929	115.0	6,705	190.9	203.4
1930	101.8	4,325	185.4	135.1
1931	69.3	3,147	169.4	107.6
1932	46.7	1,590	140.9	65.3
1933	35.8	1,021	147.8	40.0
1934	33.4	1,240	166.7	43.1
1935	33.9	1,639	165.8	57.3
1936	46.5	2,673	172.2	89.9
1937	49.1	3,237	196.2	95.5
1938	46.1	3,056	196.8	89.9
1939	56.1	3,656	197.4	107.2

[a] See Chart 24.

[b] Table A-5.

[c] For 1915–28, Lowell J. Chawner, *Construction Activity in the United States, 1915–37* (U. S. Department of Commerce, 1938), Tables 1 and 3. For 1929–39, *Survey of Current Business,* February 1942, p. 36. Includes new residential and nonresidential private and public building construction; does not include farm, highway, sewage, water supply or other public utility construction, military and naval construction, or conservation projects.

[d] *Engineering News-Record,* April 23, 1942, p. 124.

[e] Value of building construction divided by building costs.

TABLE A-17

CRUSHED STONE OUTPUT AND HIGHWAY CONSTRUCTION, 1905–39[a]

Year	*Crushed Stone Used for Concrete Aggregate and Road Metal*[b] (Th. sh. tons)	(1915:100)	*Value of New Highway Construction, Current Prices*[c] ($ mil.)	*Highway Construction Costs*[d] (1925–29:100)	*Highway Construction, Physical Volume*[e] (1915:100)
1905	17,755	..	..	..	..
1906	19,205	..	..	..	..
1907	23,953	..	..	..	..
1908	26,145	..	..	..	..
1909	29,144	..	..	..	..
1910	33,053	..	..	..	..
1911	34,226	..	..	..	..
1912	34,512	..	..	..	..
1913	36,873	..	..	..	..
1914	37,460	..	..	..	..
1915	37,641	100.0	298	56.1	100
1916	37,421	99.4	308	78.6	74
1917	31,680	84.2	313	109.9	54
1918	22,104	58.7	288	114.7	47
1919	26,868	71.4	415	120.3	65
1920	32,824	87.2	640	152.4	79
1921	36,766	97.7	840	122.4	129
1922	42,426	112.7	851	105.8	151
1923	51,048	135.6	783	117.9	125
1924	57,684	153.2	951	113.1	158
1925	62,824	166.9	1,056	107.3	185
1926	66,893	177.7	1,039	103.4	189
1927	78,544	208.7	1,190	101.9	220
1928	74,384	197.6	1,270	95.3	251
1929	76,175	202.4	1,248	92.1	255
1930	74,293	197.4	1,481	85.7	325
1931	65,812	174.8	1,323	76.8	324
1932	48,021	127.6	916	61.0	283
1933	40,857	108.5	675	74.1	172
1934	55,244	146.8	821	84.0	184
1935	49,488	131.5	622	80.6	145
1936	79,337	210.8	876	82.9	199
1937	80,272	213.3	850	79.4	202
1938	88,787	235.9	837	72.8	217
1939	96,894	257.4	884	72.6	229

[a] See Chart 26.

[b] *Mineral Resources* and its successor, *Minerals Yearbook*. Noncommercial production is included.

[c] For 1915–28, Lowell J. Chawner, *Construction Activity in the United States, 1915–37* (U. S. Department of Commerce, 1938), Table 41; 1929–39, *Survey of Current Business*, February 1942, p. 36.

[d] For 1922–39, *Engineering News-Record*, April 23, 1942, p. 174; extrapolated back to 1915 with the construction cost index, *ibid.*, p. 124.

[e] Value of new highway construction divided by highway construction costs.

TABLE A-18

PETROLEUM: DISCOVERIES AND RESERVES, 1900–42[a]

Billion barrels of 42 gallons

Year	Discoveries During Year	Cumulated Discoveries, January 1	Cumulated Production, January 1	Proved Reserves, January 1
1900	.46	3.4	.9	2.5
1901	.17	3.9	1.0	2.9
1902	.29	4.1	1.1	3.0
1903	.30	4.4	1.2	3.2
1904	.32	4.7	1.3	3.4
1905	.33	5.0	1.4	3.6
1906	.13	5.3	1.5	3.8
1907	.27	5.4	1.6	3.8
1908	.28	5.7	1.8	3.9
1909	.38	6.0	2.0	4.0
1910	.51	6.4	2.2	4.2
1911	.72	6.9	2.4	4.5
1912	.62	7.6	2.6	5.0
1913	.35	8.2	2.8	5.4
1914	.17	8.6	3.1	5.5
1915	.38	8.7	3.3	5.4
1916	.70	9.1	3.6	5.5
1917	.34	9.8	3.9	5.9
1918	.66	10.2	4.3	5.9
1919	.88	10.8	4.6	6.2
1920	.94	11.7	5.0	6.7
1921	1.07	12.6	5.4	7.2
1922	.36	13.7	5.9	7.8
1923	.73	14.1	6.5	7.6
1924	.61	14.8	7.2	7.6
1925	1.76	15.4	7.9	7.5
1926	1.07	17.2	8.7	8.5
1927	2.60	18.2	9.4	8.8
1928	1.40	20.8	10.3	10.5
1929	3.21	22.2	11.2	11.0
1930	1.30	25.5	12.3	13.2
1931	.25	26.7	13.1	13.6
1932	.09	27.0	14.0	13.0
1933	.61	27.1	14.8	12.3
1934	1.09	27.7	15.7	12.0
1935	1.22	28.8	16.6	12.2
1936	1.76	30.0	17.6	12.4
1937	3.72	31.8	18.7	13.1
1938	3.06	35.5	20.0	15.5
1939	2.40	38.5	21.2	17.3
1940	1.89	40.9	22.5	18.5
1941	1.97	42.8	23.8	19.0
1942	..	44.8	25.2	19.6

[a] See Chart 43. Data on discoveries compiled by American Petroleum Institute and reproduced with permission from unpublished material. Figures for production by U. S. Bureau of Mines; see also Table A-1 above. Reserves are obtained by difference.

For a definition of proved reserves, and for a description of the methods used in compiling estimates of the kind shown in this table, see National Resources Committee, *Energy Resources and National Policy* (1939), pp. 127-33.

TABLE A-19

OIL AND GAS WELLS, 1939

Derivation of Employment Estimates in Table 7 and Comparison with Table A-3[a]

Industry	*300-Day Wage Earners*	*Wage Earners, Census Average*	*Salaried Employees*	*Proprietors and Firm Members*	*Total Engaged*[b]	*Wage Earners, Active Period Average*	*Wage Earners, Census Average (Table A-3)*
Petroleum and Natural Gas							
Producing and nonproducing operations, Census figure	..	105,505	30,546	6,294	142,345	112,678	..
Producing and nonproducing operations, 300-day wage earners[c]	105,505	..	..	..	..	..	..
Producing operations only, Census figure	..	..	..	..	..	..	105,166
Small producers, Census figure	2,179	2,179	..	1,242	3,421	2,179	..
Natural Gasoline							
Census figure	..	8,332	2,005	10	10,347	8,608	8,332
300-day wage earners[d]	9,928	..	..	..	..	..	..
Small producers, Census figure	8	8	..	37	45	8	..
Field Services (Contractors)							
Census figure	..	40,061	5,153	1,725	46,939	43,308	40,061
300-day wage earners[e]	41,720	..	..	..	..	..	..
TOTAL	159,340	156,085	37,704	9,308	203,097	166,781	153,559

[a] Except where otherwise indicated, all figures in this table are transcribed directly from preliminary releases of the Census of Mineral Industries, 1939. For small producers, neither value of products, nor expenses, nor outlay for buildings and equipment, nor cost of drilling amounted to as much as $2,500.

[b] Sum of three preceding columns.

[c] Assumed to equal Census average wage earners; no data on number of days in operation are available.

[d] Natural gasoline plants operated 346 days in 1939; $8,608 \times 346 \div 300 = 9,928$.

[e] Field services operated 289 days in 1939; $43,308 \times 289 \div 300 = 41,720$.