BEFORE THE UNITED STATES ANTHRACITE COAL COMMISSION

EMPLOYES EXHIBIT NUMBER_____

The Relationship Between Rates of Pay and Earnings and the Cost of Living in the Anthracite Industry of Pennsylvania

Presented by
W. JETT LAUCK

On behalf of

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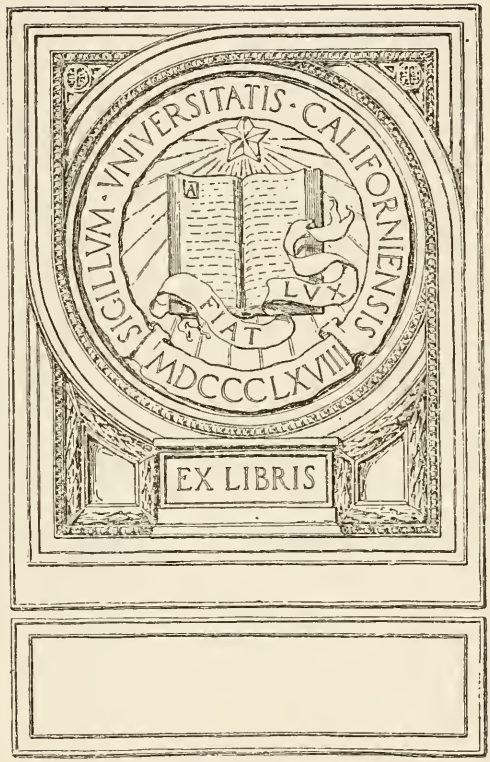
Of the

United Mine Workers of America

WASHINGTON
1920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BEFORE THE UNITED STATES ANTHRACITE COAL COMMISSION

EMPLOYES EXHIBIT NUMBER 6

The Relationship Between Rates of Pay and Earnings and the Cost of Living in the Anthracite Industry of Pennsylvania

Presented by

W. JETT LAUCK

On behalf of

United Mine Workers of America

WASHINGTON

1920

THE RELATIONSHIP BETWEEN RATES OF PAY AND EARNINGS AND THE COST OF LIVING IN THE ANTHRACITE INDUSTRY OF PENNSYLVANIA

By far the largest single group of employees in the anthracite mines is that of contract miners, constituting as they do about 30 per cent. of the entire number of employees. The rates of these men vary from colliery to colliery, and even from vein to vein. No attempt has ever been made to classify or standardize their rates, and all wage adjustments made since the great strike of 1902 have accepted the old rates as they stood and added thereto a specified percentage increase. Thus rates exist today the basis of which probably were first established twenty years ago or more.

The table below gives the relative rates since 1902, that is the rates based on the pre-strike rate of 100.

1902 pre-strike	100.0
1903	114.40
1904	114.95
1905	114.31
1906	114.58
1907	114.22
1908	114.40
1909	114.49
1910	114.40
1911	114.95
1912 after April	121.00
1913	121.00
1914	121.00
1915	121.00
1916 after April	129.5
1917 after April	142.50
1917 after November	161.90
1918 after November	181.30
1919	181.30
1920 to April	181.30

The award of the Anthracite Coal Strike Commission gave these employees a 10 per cent. increase in rates. It also provided that for each 5-cent advance in the wholesale price of coal at

New York City the miners should have a 1 per cent. increase in rate over the new base established by the Commission.

This agreement remained in effect nine years. During that time the sliding scale was responsible for increases in rate above the 1902 rate varying from 4.22 per cent. in 1907 to 4.95 per cent. in 1904 and 1911. The average increase for the nine years was 4.2 per cent. A new agreement was entered into on May 20, 1912. Under this agreement the sliding scale was abolished and in its place was granted an increase of 10 per cent. over the rate of 1911. This increased the basic relative from 110, which it had been from 1903 to 1911, to 121. The basic rate for 1911 plus the additional wage received under the sliding scale made the index number for that year 114.95. Therefore, the actual increase brought about by the agreement of 1912 was 6.05 points. The wage of 1912, therefore, shows an increase of 5.2 per cent. over that of 1911, and a total increase of 21 per cent. over the pre-strike rate of 1902. On May 5, 1916, a new agreement was entered into under which tonnage rates were raised 7 per cent. above the rates in 1915. This made a total increase of 29.5 per cent. over the rate of 1902. Since 1916 three new voluntary agreements have been entered into, each of which provided an increase in rates. These increases, however, were given not in the form of rate increases, but in the form of additions to gross earnings. Thus the agreement of April 26, 1917, provided for the addition of 10 per cent. to the gross earnings of each miner as determined by the agreement of May 5, 1916. On November 17, 1917, this was superseded by an agreement giving a 25 per cent. increase on gross earnings, based on the agreement of 1916. Finally, on November 15, 1918, the percentage bonus was raised to 40 per cent. Under these last three agreements it will be seen that the net increase in miners' rates above the 1902 base has been 42.5, 61.9 and 81.3 per cent.

The agreement of November 15, 1918, according to its terms, was to remain in effect until the declaration of peace, or until March 31, 1920, if peace was not declared before that day. By a subsequent agreement entered into September 29, 1919, the conditional clause was eliminated and the duration of the agreement until March 31, 1920, made unconditional.

No satisfactory figures exist for changes in the cost of living prior to the studies made by the United States Bureau of Labor Statistics. As explained elsewhere, these figures do not go back of the war period, so in order to compare them with the wage rates of contract miners it is necessary to take the rates that

existed in 1914 as a base (that is as equal to 100.0) and compute from that the relatives since. These rates are as follows:

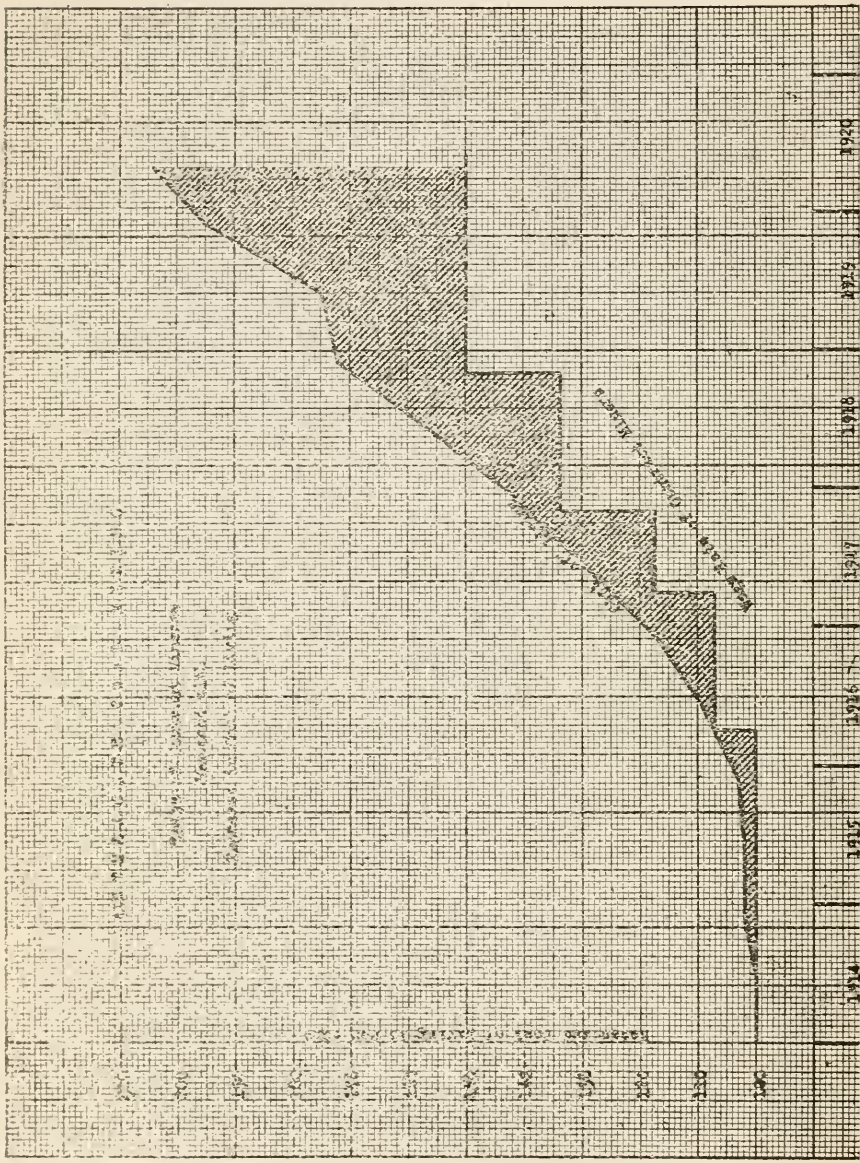
	Rates of Contract Miners 1914 as base = 100.0
1914	100.0
1915	100.0
1916 after April	107.0
1917 after April	117.7
after November	133.75
1918 after November	149.8
1919	149.8
1920 to April	149.8

As the cost of living from 1914 up to May, 1920, has risen 104 per cent., while the contract rates have risen only 49.8 per cent., it is evident that the contract miners are not today as well off as they were at the beginning of the war in 1914.

This is shown graphically on the following chart:

ANTHRACITE COAL MINING

Rates of Contract Miners Compared with Increase in Cost of Living



DATA FOR CHART ON RATES OF CONTRACT MINERS AND ON COST OF LIVING

	Wage Rates of Contract Miners Per Cent.		Cost of Living Per Cent.
1914	100.0	July, 1914	100
1915	100.0	Dec., 1914	102
1916 (After April)	107.0	June, 1915	102
1917 (After April)	117.7	Dec., 1915	103
1917 (After Nov.)	133.75	June, 1916	109
1918 (After Nov.)	149.8	Dec., 1916	117
1919	149.8	June, 1917	129
1920 (To April)	149.8	Dec., 1917	141
		June, 1918	156
		Dec., 1918	172
		June, 1919	175
		Dec., 1919	195
		May, 1920	204

In order to restore the rates of the contract miner to the same relationship to the cost of living that was established by the wage adjustment in 1912, it would be necessary to increase the present rates by 36.2 per cent.

A very common rate for coal (gangway and airway) in 1914, established in 1912, was close to $1.00 per car. This rate, with the subsequent increases, has now become $1.498, but in order to raise it up to the point where the day's earnings will buy the same necessities of life that they would buy in 1914, it would have to be increased now to $2.04 per car, an increase amounting, as explained above, to 36.2 per cent.

But simply increasing the rate *up to* the cost of living at infrequent intervals does not result in even approximate justice to the worker on account of the amount of purchasing power that he has lost in the past through the fact that his earnings have lagged behind the cost of living. As an illustration, assume that the wage is so adjusted at the start of a period that one day's earnings will be sufficient to purchase, say, 100 pounds of flour. During the period, and before the next adjustment, if flour rises in price 50 per cent., the worker will find that he can purchase with one day's earnings only 66.67 pounds of flour, and that he is obliged to work a day and a half in order to obtain the needed 100 pounds. The result must be that he and his family go without something they formerly enjoyed, or else he runs into debt. When the next wage adjustment comes, even if his rate is increased 50 per cent. so that he can once more purchase his 100 pounds of flour with one day's earnings, he is not recompensed

for his forced self-denial during the period, nor is he able to pay the debts he has contracted.

Another way of expressing this is as follows: At any wage fixation, both parties to the fixation have their attentions focused, consciously or unconsciously, upon the purchasing power of the wage as fixed. *The number of dollars is important only as compared with the amount of commodities that may be purchased.* At the wage fixation of 1916 (which forms the basis of all subsequent increases) a certain definite purchasing power was given to the mine workers. It was, of course, the intention that the mine workers should continue to receive this purchasing power. It was decided that they needed at least this purchasing power in order to pay their bills. But, owing to the great increase in prices, the mine workers have not received what the wage fixation decreed they should receive. No one of the subsequent increases has been sufficient even to bring their wage back to the purchasing power fixed in 1916. The result is, then, that the mine workers have actually lost.

The shaded area on the chart shows the amount that has been lost by the contract miner through this failure of his rate to keep pace with the cost of living. A glance at the chart shows that in April, 1916, the rate was raised just up to the cost of living line, but not above it, so although he could then purchase all that he could in 1914, he was not repaid for his losses already incurred. Since April, 1916, none of the increases has brought the rate up to a reasonable distance of the cost of living, and the increase of November, 1918, was notably inadequate.

If we disregard all losses incurred by the miner prior to the increase of November, 1917, we can compute his loss per car by taking any of the rates and subtracting it from what it should have been in each of the succeeding months. Thus if we take the rate that was $1.00 per car in 1914 and is $1.498 per car now, his losses per car have been for each month as follows:

	Amount lost by Contract miner per car through failure of wage rate to keep pace with the cost of living.
November, 1917	$0.05
December	.07
January, 1918	.09
February	.12
March	.14
April	.17
May	.19
June	.22
July	.24
August	.27
September	.30
October	.32
November	.19
December	.22
January, 1919	.22
February	.23
March	.23
April	.24
May	.24
June	.25
July	.28
August	.31
September	.35
October	.38
November	.41
December	.45
January, 1920	.47
February	.49
March	.50
April	.52
May	.54
Total	$8.70
Average—31 months	0.281
One twenty-fourth of total	0.362

If it were intended to repay the miner for these accumulated losses within *one month*, it would be necessary to add the above total to his rate per car during that month. This, however, manifestly is far too much to ask.

If, on the other hand, a wage agreement is signed up for the twenty-four months commencing April 1, 1920, there should be added to his rate one-twenty-fourth of the above total, or $0.362 per car.

This amount added to the rate as brought up to the cost of living ($2.04) gives the rate of $2.402 per car as a fair and equitable rate superseding the rate that was $1.00 in 1912 and is $1.498 now. This is an increase amounting to 60.3 per cent. of the present rates.

In precisely a similar way, the losses incurred by any contract miner, working at any rate, may be computed, and if these losses are pro-rated through a period of twenty-four months from April, 1920, an increase amounting to 60.3 per cent. must be made to each and every contract rate.

In this connection, also, it will be well to remember that no losses incurred before November, 1917, are taken into account in the above calculation, and also that it is assumed that the rise in the cost of living that may take place in the future will be compensated for at some future adjustment.

Elsewhere is shown, in the exhibit on the irregularity of employment, the average days worked during the past year by the anthracite mines. As explained there, no one definitely knows what the average for the year 1919 was, but the indications are that it was not far from 252. Using this figure, the opportunity to work during the past few years has been as follows:

Year	Average Number of days worked
1913	257
1914	245
1915	230
1916	253
1917	285
1918	293
1919	252

With the exception of the abnormal years of 1917 and 1918, the year 1919 does not appear to have been out of the ordinary except, perhaps, to the extent of a few per cent. It is shown elsewhere that the present outlook for work in the future seems to indicate that about 245 to 255 will be the average number of days worked per year during the future, and therefore it is fair to expect that the rates of wage, both contract and day, should be increased from time to time at least enough to balance the effect of rising prices and to compensate for losses already suffered.

The fact must not be lost sight of that in 1916 there was a reduction in hours from nine to eight per working day. This was a reduction of time amounting to 11 per cent., but it is not claimed that the rates should be increased by that amount in comparing the wage rate with the cost of living because the reduction of hours brought about such an increase in productive efficiency that the actual daily output per man day was greater under the eight-hour day than under the nine-hour day. (See Monthly Review, Bureau of Labor Statistics, August, 1917.)

Wage Rates of Employees Other Than Contract Miners

The Pennsylvania Department of Internal Affairs reported the following distribution of employees at the anthracite mines from 1908 to 1912 (no report of distribution made since):

AVERAGE NUMBER OF WAGE EARNERS

	1912	1911	1910	1909	1908
Miners	42,201	44,290	42,897	43,343	43,482
Miners—laborers	33,292	32,691	32,536	32,778	38,896
Other inside—men	48,024	46,784	44,750	46,034	45,485
Other inside—boys	7	201	5	315	160
Outside—men	29,554	28,082	28,092	27,217	27,323
Outside—boys	135	1,310	1,044	2,794	3,432
Breaker employees	16,238	16,271	16,310	16,855	17,600
Total	170,451	169,629	165,634	169,336	176,377

From this table it appears that about half the total employees of the industry are contract miners and their laborers, and about half are engaged in miscellaneous occupations in and outside the mines. These other occupations are many, and no one is comparable in regard to numbers of men employed to that of contract miners. Most of them are paid by the day.

The wage rates of these occupations are extremely numerous, each company, and even each colliery, having its own set of rates which differs from all other sets of rates in effect elsewhere. To show the variation in rates among men engaged in pratically identical work the following table is prepared, giving the rates in effect after the application of the November, 1918, increase, for the principal occupations in the larger collieries of District 1.

DAY RATES FOR PRINCIPAL OCCUPATIONS IN THE LARGER COLLIERIES OF DISTRICT I

In Effect in November, 1918

	Company Miner	Company Miner's laborers	Laborers Inside	Laborers Outside	Carpenters 1st class	Ash men
Old Forge Colliery—Penn. Coal Co.	$4.40	.....	$4.09	$3.84	$4.855	$3.635
Nat. Col.—D. L. & W.	.....	.....	4.40	3.61	4.53	3.61
Van Storch Colliery	4.47	.....	4.11	3.61	4.685	3.61
Boston Colliery—D. & H. Coal Co.	4.47	4.11	4.11	3.61	.....	3.61
So. Wilkesbarre Colliery—L. & W. B.	4.80	4.34	.....	3.67	4.62	3.67
Pine Brook Colliery—Scranton Coal Co.	5.48	4.85	.....	3.49	4.64	3.61
Westmoreland Colliery—L. V. Coal Co.	4.74	4.47	4.47	3.35	4.48	3.47
No. 5 Colliery—Susquehanna Coal Co.	4.78	4.12	.....	3.355	4.62	3.67
Average	$4.73	$4.38	$4.236	$3.567	$4.633	$3.611

	Slate pickers 1st class men	Brattice men	Blacksmiths 1st class	Blacksmiths helpers	Carpenter helpers	Trackmen (inside)	Trackmen helpers
Old Forge Colliery, Penn. Coal Co.	$3.43	$4.09	$4.855	$3.635	$3.84	$4.855	$4.09
National Col.—D. L. & W.	2.42	4.77	4.685	3.61	3.79	4.775	4.40
Van Storch Col.	2.45	4.11	4.685	3.78	3.78	4.685	4.11
Boston Col.—D. & H. Coal Co.	.....	4.47	4.685	3.61	.....	4.73	4.11
So. Wilkesbarre Co. L. & W. B.	2.45	4.49	4.67	3.67	3.67	4.80	4.34
Pine Brook Colliery —Scranton C. C.	2.45	4.39	4.69	3.93	3.79	4.78	4.02
Westmoreland Col., L. V. Coal Co.	2.44	.....	4.79	3.67	3.62	4.51	4.10
No. 5 Col.—Susquehanna C. C.	3.355	4.49	4.80	3.60	3.60	4.78	4.17
Average	$2.713	$4.401	$4.732	$3.688	$3.727	$4.737	$4.167

This table illustrates at once the great need of some standardization of rates within the industry, and also the practicability of such standardization. The ashmen, to take a single instance, have an average rate of $3.61 per day, and this is also the rate at four out of the eight collieries. Manifestly, inasmuch as all are performing the same work, all should be brought to one rate.

While there may be considerable difference between the work of a miner in the anthracite field and the work of a miner in the bituminous field, there is no great difference between the two

industries in the work of the miscellaneous men—that is, of the day men employed at such occupations as blacksmith, brattice-men, trackmen, engineers, firemen, carpenters, laborers, and the like. The bituminous industry has for some years standardized within broad areas its employees, fixing rates effective respectively for all blacksmiths, for all engineers, for all trackmen, and so forth. It is evident that if this was possible in the bituminous industry, it is trebly possible in the anthracite industry, because here (1) the geographical area covered is smaller, insuring greater uniformity of living conditions, competing wage rates of other industries, and prices of commodities; (2) the control of the anthracite industry is much more highly concentrated than the control of the bituminous industry; (3) the working conditions of the different collieries are more nearly similar each to each than is the case in the bituminous industry.

The increase that these miscellaneous occupations have received since 1912 has been greater than the increase that took place in the cost of living; though even so their present rates are below what they should be for the maintenance of a proper standard. Of course this is because the rates they received before 1912 were so fearfully inadequate, that even with the comparatively large increases they are not receiving a living wage.

The following table gives the daily wage for inside and outside day labor for District No. 7, in effect in April, 1912, and in November, 1918:

DISTRICT No. 7

	Daily Wage		Increase in	Relative Wage		Increase in
	1913	1920	Dollars	1913	1920	Per Cent.
INSIDE:						
Day Wage Miners.....	2.54	4.60	2.06	100.0	181.1	81.1
Day Wage Laborers....	2.20	4.25	2.05	100.0	193.2	93.2
Skilled Labor	2.45	4.50	2.05	100.0	183.7	83.7
Semi-skilled labor.....	2.30	4.35	2.05	100.0	189.1	89.1
OUTSIDE:						
Common labor	1.54	3.31	1.77	100.0	214.9	114.9
Semi-skilled	1.54	4.25	2.71	100.0	275.9	175.9
Skilled	2.20	4.25	2.05	100.0	193.2	93.2

The increase in per cent. since the 1912 rate has been 81.1 for the day wage miner and 175.9 per cent. for the semi-skilled outside labor. The inside workers have not in general received quite the increase in the cost of living (which has been about 100 per cent. or a little more), but they have very nearly done

so. The outside workers, on the other hand, have received considerably in excess of this cost of living increase.

In more detail, the following table shows the increases received in the more important occupations of the collieries of Districts No. 1 and No. 9.

(Note:—In spite of different conditions, the average wage of the day wage men in Districts Nos. 1 and 9 are nearly the same. This is shown by the following tabulation of the day wages in the two districts after April, 1912.

	District No. 1	District No. 9
Company Miner	$2.654	$2.499
Co. Miner Lab	2.374	2.129
Inside Laborer	2.101	2.064
Outside Laborer	1.745	1.812
Carpenters 1 C	2.575	2.562
Blacksmiths 1 C	2.653	2.636
Ashmen	1.760	1.638
Slaters, men	1.289	1.287
Bratticemen	2.332	2.448

Thus the average of either district may be taken with accuracy as holding substantially true for both.)

AVERAGE RATES IN THE LARGER COLLERIES OF DISTRICTS NOS. 1 AND 9

	1912 (After April)	1918 (After Nov.)	Increase in Dollars	Increase in Per Cent
Company miner	$2.654	$4.73	2.08	80.1
Company miner, laborer	2.374	4.38	2.01	84.5
Inside laborer	2.101	4.236	2.13	101.6
Outside laborer	1.745	3.567	1.82	104.4
Carpenter—1st class	2.575	4.633	2.06	79.9
Carpenter—helper	1.891	3.727	1.83	97.1
Blacksmith—1st class	2.653	4.732	2.08	78.3
Blacksmith—helper	1.811	3.688	1.87	103.6
Ashmen	1.760	3.611	1.85	105.2
Slate pickers—1st class men	1.289	2.713	1.52	110.5
Bratticemen	2.332	4.401	2.07	88.7
Trackmen (inside)	2.661	4.737	2.07	78.0
Trackmen—helpers	2.115	4.167	2.05	96.7

It will be noticed that in the above table, and in the table for District No. 7, the inside workers and the higher paid outside workers received an increase averaging a little over $2.00 per day, while the lower paid outside workers received an increase averaging only about $1.85 per day. In spite of this difference in the amounts of the increase, the lower paid workers figure out a larger per cent. increase because the $1.85 forms a larger proportion of their former wage than the $2.00 of the higher paid men forms of theirs.

It might well be urged that clothing, food and other necessities have advanced as much more for the lower paid men as for the higher, and that therefore all should receive *the same* flat increase, but in addition to that something is due the lower paid men as recompense for losses during the past few years, and this is true in spite of the fact that their percentage increases have been greater than the percentage increases in the cost of living.

The operators frequently claim that the rate for common labor outside the mines is the "yard-stick" by which all other rates have been measured and fixed. This, of course, is by no means the case, any more than the rate of building laborers determines the rate paid to brick masons and carpenters. There is no objection, however, to this method of determinations provided the rate for common labor is set with due regard to the necessary standard of living, and that the differentials to be paid for added experience and skill are sufficiently high.

The present rate for common labor is on the average about 41 cents to 44 cents per hour for an eight-hour day. This rate was set by the adjustment made in November, 1918, and, of course, is far too low under present conditions of prices. The minimum wage rate established by the National War Labor Board in June, 1918, was for localities similar to Pennsylvania either 42 cents or 42½ cents per hour assuming an average ten-hour day. The ruling in the street railway cases, for instance, was that "The intent of the award is to give every adult male employee affected engaged in an occupation essential to the operation of the company and whose rate is not specifically fixed by the award *a daily wage of at least* $4.25 *for ten hours' work.*" With an increased cost of living of about 32 per cent. since June, 1918, this daily wage should be increased as of today to $5.61.

This minimum rate fixed by the War Labor Board was not intended to give common labor an unusual rate, but was granted in accordance with the ruling of the Board that, "The period of the war is not a normal period of industrial expansion from which the employer should expect unusual profits or the employees abnormal wages; that it is an interregnum in which industry is pursued only for common cause and common ends."

Earnings

The most recent investigation into the earnings of anthracite mine workers was made in January, 1919, by the United States Bureau of Labor Statistics. A half month payroll period, ending January 31, 1919, was selected. In its report, the Bureau says, "The ideal method of arranging the field work of a survey of this kind would be to have all the schedules cover the same payroll period. It was possible to carry this out in the anthracite field. All schedules in that branch of the industry are for the payroll period ending January 31, 1919." * * * "In January mines were still running full time, though with diminished intensity. *Thus all the mines included in the anthracite field were running full time on the date of the survey.*" * * * "No mines working less than full time were included in the survey" (in the anthracite field).

The half month period of the survey included 14 working days. Therefore, in order to compute the average earnings of the year, all that is necessary is to divide the total average earnings of the half month period by 14, in order to obtain the average daily wage, and then multiply the resulting figure by 252, which was the average number of days worked during the year 1919.

In the following table is shown for each of the occupations the full time daily earnings (Column A). This is the average wage that would be earned per day while the mine was open if the employee worked. Column C gives the average actual daily wage, that is the average wage earned per week day. It is found, as explained above, by dividing the total average earnings for the 14-day period by 14. Where the figures in Column C are lower than Column A it means that the workers in that occupation did not work the full time for every day. Where C is higher than A it means that overtime was worked.

Column B is the estimated full time earnings for the year 1919. It is found by multiplying the full time daily earnings by 252, which was the estimated average number of days worked in the year.

Column D is the estimated actual yearly earnings for the year 1919. It is found by multiplying the actual daily earnings by 252.

AVERAGE FULL-TIME AND ACTUAL YEARLY EARNINGS BASED ON ONE-HALF MONTH PERIOD IN JANUARY, 1919

Occupation	Number of Employes	Full-time Daily Earnings *A*	Estimated Full-time Yearly Earnings 252 Days *B*	Actual Daily Earnings *C*	Estimated Actual Yearly Earnings *D*
Inside:					
Blacksmiths	30	$4.733	$1193.	$5.254	$1324.
Bratticemen	116	4.488	1131.	4.486	1130.
Cagers	234	4.160	1048.	4.699	1184.
Car runners	342	4.061	1023.	3.973	1001.
Company miners	656	4.651	1172.	3.914	987.
Co. miners, laborers	632	4.208	1060.	3.876	977.
Consideration miners	498	5.085	1281.	4.586	1156.
Contract miners	4,887	6.735	1697.	5.683	1432.
Cont. miners, laborers	1,855	5.112	1288.	3.571	900.
Door tenders (boys)	247	2.509	632.	2.404	606.
Drivers	479	3.990	1006.	3.761	948.
Engineers	121	4.518	1138.	5.024	1266.
Laborers	1,200	4.200	1058.	3.939	993.
Machinists	67	4.985	1256.	4.592	1157.
Masons	41	4.614	1162.	4.611	1162.
Motormen	247	4.462	1124.	5.199	1310.
Motor brakemen	190	4.014	1012.	4.274	1077.
Pumpmen	104	5.221	1315.	5.030	1267.
Timbermen	170	5.562	1402.	4.250	1071.
Trackmen	163	4.564	1150.	4.674	1177.
Total inside occupations	12,279	$5.407	$1363.	$4.655	$1173.
Outside:					
Ashmen	72	$3.886	$979.	$4.059	$1023.
Blacksmiths	60	4.573	1152.	5.140	1295.
Cagers	119	3.701	932.	4.332	1092.
Carpenters	250	4.516	1138.	5.306	1337.
Car runners	83	3.629	915.	3.552	895.
Dumpers	88	3.591	905.	3.559	897.
Engineers	248	4.500	1134.	5.271	1328.
Firemen	314	4.570	1151.	4.616	1163.
Laborers	1,211	3.549	894.	3.710	935.
Loaders	199	3.581	902.	3.923	989.
Machinists	112	4.132	1041.	5.200	1310.
Oilers	77	3.470	874.	4.041	1018.
Repairmen	113	3.879	977.	4.279	1079.
Timber cutters	115	3.619	912.	4.208	1060.
Trackmen	28	3.814	961.	3.947	995.
Outside—Breaker:					
Jig runners	81	3.281	827.	3.837	966.
Platemen	180	3.441	867.	3.652	920.
Slaters (boys)	580	2.386	601.	2.139	539.
Total outside occupations	3,930	$3.629	$914.	$3.884	$979.
Grand Total—Inside and Outside Occupations	16,209	$4.976	$1254.	$4.467	$1126.

While it is probable that 252 working days a year is rather more than can reasonably be expected for an average of the future, it is a less number than was worked during 1918 and 1917. This matter is fully discussed in the exhibit on the irregularities of employment.

The above table shows average yearly earnings for anthracite mine workers as follows:

	1919 Full Time Earnings 252 Days	1919 Actual Earnings 252 Days
Inside occupations	$1,363	$1,173
Outside occupations	914	979
All occupations	1,254	1,126

Note that the average actual earnings for outside occupations is larger than the full time earnings. This is because of the large amount of overtime put in by the outside men. The chief difference between full time and actual earnings comes in the case of contract miners and their laborers, that is to say these two occupations apparently worked a smaller proportion of the full time than any other occupations. These figures are really meaningless, however, as these two occupations depend not on hours, but on tonnage. If the contract miners had worked the full time, the number of days worked by the mines would have been cut down, and the outside occupations would also have been forced to put in more overtime during the days worked than was actually the case.

While we have included earnings for overtime in the above table, we have done so simply because we had no data whereby we could segregate these earnings and show what the daily and yearly earnings would be without overtime. It seems but fair, and in accordance with the best thought of economists and with recent decisions of arbitration boards and commissions, to base wage rates upon possible earnings during a reasonable number of hours per day and a reasonable number of days per year. *"The amount of money to be earned by anticipated overtime should not be included in the amount to be established as a fair return to the worker."*

The Pennsylvania Workmen's Compensation Commission in a report compiled jointly by the Insurance Department of Pennsylvania and the Statistical Department of the Pennsylvania Compensation Rating and Inspection Bureau give the average weekly earnings of all employees in the anthracite industry as follows:

Year	Average Weekly Earnings
1916	$13.98
1917	15.02
1918	17.69

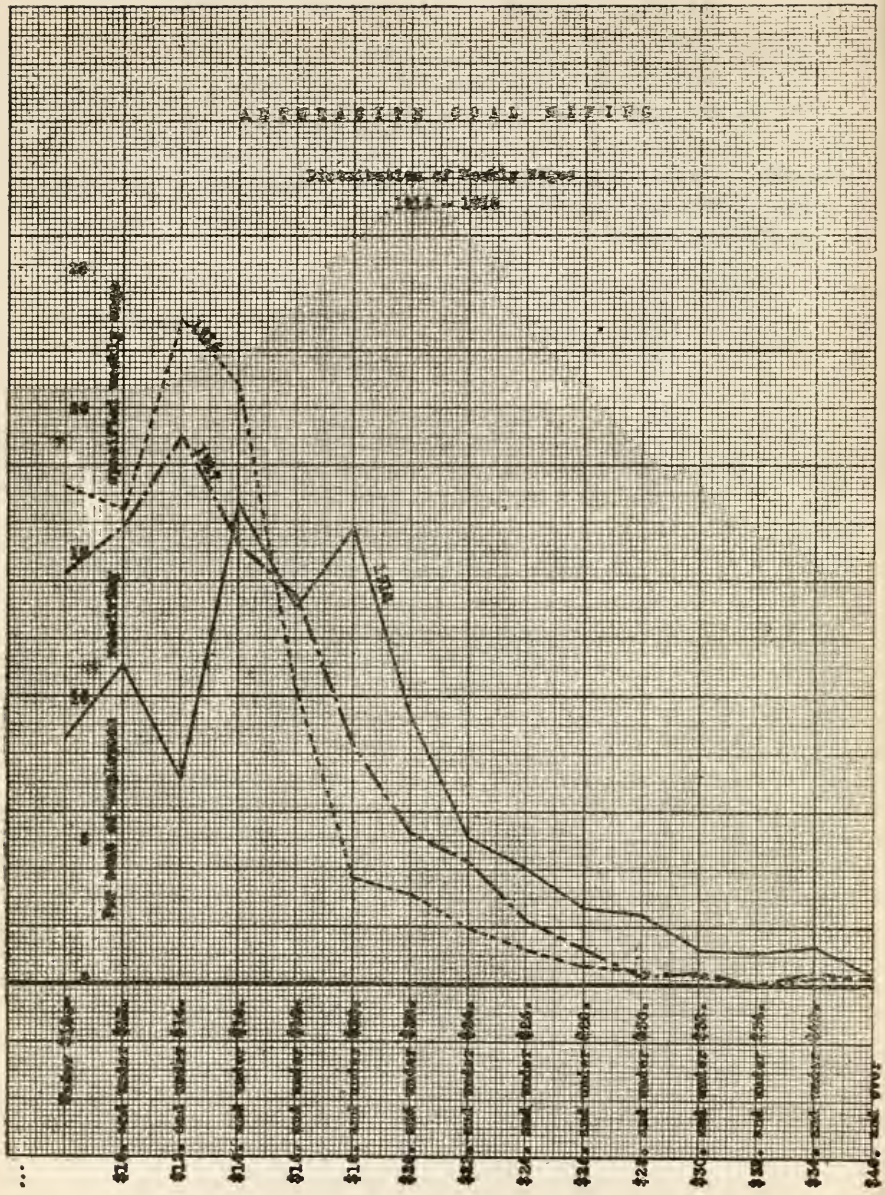
These earnings, however, are full-time earnings, assuming the mines to be open. They are computed by taking the six-months' actual earnings and dividing by the days worked during the period. On this basis, taking the days worked from the reports of the United States Geological Survey, the actual average yearly earnings would be:

Year	Average Yearly Earnings
1916	$590.00
1917	713.00
1918	863.00

The distribution of the weekly earnings is shown by the table below. This table shows the number of employees receiving weekly wages below $10, and in groups of $2 increments, for 1916, 1917 and 1918. The chart following the table shows the same figures graphically.

ANTHRACITE EARNINGS REPORTED BY PENNSYLVANIA WORKMEN'S COMPENSATION COMMISSION

Employees Receiving	1916		1917		1918	
	Number	Per Cent	Number	Per Cent	Number	Per Cent
Under $10	289	17.2	279	14.3	133	8.5
$10. and under $12	277	16.5	311	15.9	172	11.1
$12. and under $14	387	23.1	372	19.1	111	7.1
$14. and under $16	348	20.8	297	15.2	260	16.7
$16. and under $18	172	10.3	263	13.5	203	13.1
$18. and under $20	63	3.8	144	7.4	246	15.8
$20. and under $22	53	3.2	102	5.2	144	9.3
$22. and under $24	33	2.0	84	4.3	79	5.1
$24. and under $26	21	1.2	44	2.3	64	4.1
$26. and under $28	11	0.7	25	1.3	41	2.6
$28. and under $30	9	0.5	7	0.3	38	2.4
$30. and under $32	5	0.3	9	0.4	19	1.2
$32. and under $34	0	....	3	0.1	18	1.2
$34. and under $40	4	0.2	9	0.5	21	1.3
$40. and over	4	0.2	4	0.2	6	0.4
Total	1,696	100.0	1,953	100.0	1,555	100.0


ANTHRACITE COAL MINING
Distribution of Yearly Rates
1914 - 1916
Per cent of operations
Under $10.
$10. and under $12.
$12. and under $14.
$14. and under $16.
$16. and under $18.
$18. and under $20.
$20. and under $22.
$22. and under $24.
$24. and under $26.
$26. and under $28.
$28. and under $30.
$30. and under $32.
$32. and under $34.
$34. and over

The Pennsylvania Department of Internal Affairs reported average yearly earnings for anthracite workers for the years from 1903 to 1912, inclusive. A table of these earnings follows. The figures, however, are not as reliable as the figures computed from the survey of the United States Bureau of Labor Statistics nor are they as reliable as the figures reported by the Workmen's Compensation Commission.

AVERAGE YEARLY EARNINGS

PENNSYLVANIA ANTHRACITE MINES

	1912	1911	1910	1909	1908	1907	1906	1905	1904	1903	1902
Miners	729	744	711	651	673	717	641	690	685	701	496
Miners' laborers	496	510	468	441	387	489	421	458	462	447	....
Other inside men	541	558	526	489	505	574	463	530	781	461	363
Boys, inside	286	272	182	220	229	267	241	242	241		
Outside workmen	527	535	541	482	500	558	494	543	542	480	306
Breaker employees	358	374	329	323	329	422	351	287	277	284	....
Boys, outside	242	232	209	192	206	278					
Average	560	573	544	498	496	574	494	521	574	491	....

BEFORE THE UNITED STATES ANTHRACITE COAL COMMISSION

EMPLOYES EXHIBIT NUMBER 7

Comparison of Earnings and Wage Rates in the Anthracite and Bituminous Mines of Pennsylvania

Presented by
W. JETT LAUCK

On behalf of

John L. Lewis, President
Philip Murray, Vice-President
F. P. Hanaway, International Representative
Percy Tetlow, Statistician

John Dempsey
Thomas Kennedy
Chris. J. Golden
} Committee Representing Districts 1, 7 and 9

Of the

United Mine Workers of America

WASHINGTON
1920

This exhibit was prepared under the
supervision of
W. JETT LAUCK
by Arthur Sturgis

BEFORE THE UNITED STATES ANTHRACITE COAL COMMISSION

EMPLOYES EXHIBIT NUMBER_____

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5 A

COMPARISON OF EARNINGS AND WAGE RATES IN THE ANTHRACITE AND BITUMINOUS MINES OF PENNSYLVANIA

The present yearly earnings in the anthracite mines are considerably lower than they are in the bituminous mines of Pennsylvania, although in former years there was very little difference between the two industries. This is shown in the table below.

COMPARATIVE YEARLY EARNINGS—ALL EMPLOYEES PENNSYLVANIA ANTHRACITE AND PENNSYLVANIA BITUMINOUS MINES.

	Average earnings Pennsylvania anthracite.	Average earnings Pennsylvania bituminous.
1903	491	541
1904	574	452
1905	521	503
1906	494	545
1907	574	604
1908	496	458
1909	498	524
1910	544	574
1911	573	584
1912	560	663
1913	No data	No data
1914		
1915		
1916	590	689
1917	713	877
1918	863	1216
1919	1126	1337

The sources from which this table is compiled are as follows: The figures for the years 1903 to 1912, inclusive, are taken from the reports of the Pennsylvania State Department of Internal Affairs, and are computed by the Statistical Bureau of that Department by dividing the total yearly payroll by the average number of total employees.

The basic figures upon which this Statistical Bureau made its report were furnished by the operators of the coal mines, and it is to

be presumed, therefore, that the figures are accurate. Of course, the resulting earnings in the table cannot be compared from year to year—that is, the year 1903 cannot be compared with the year 1916, nor the year 1916 with the year 1919, because, as shown below, the source is different and the method of computing the figures is different. But each year presents comparable figures as between the anthracite and the Pennsylvania bituminous fields, because in each year the figures for the two fields are derived from the same source and the same method of computation is used. It is doubtless true, moreover, that the figures from the Department of Internal Affairs reflect accurately the *relative* conditions as to earnings between the two fields, though the *absolute* earnings cannot be so confidently relied upon.

The figures for 1916 to 1918, inclusive, are derived from a report of the Pennsylvania State Workmen's Compensation Commission, compiled jointly by the Insurance Department of Pennsylvania and the Statistical Department of the Pennsylvania Compensation Rating and Inspection Bureau. These figures are published as average full-time weekly earnings, from which the yearly earnings are derived by first finding the daily earnings and then multiplying by the number of days worked in the respective fields in Pennsylvania as reported by the United States Geological Survey.

Here, again, the same method of computation is followed for both anthracite and bituminous earnings, so a comparison between the two fields for any one year presents the relative difference during that year.

The figures for 1919 are based upon a survey made by the United States Bureau of Labor Statistics. The survey of the anthracite mines was made at a time when all the mines covered by the survey were working full time, and the yearly earnings given in the table are the average daily earnings found by the survey multiplied by the average number of days worked (252) in the anthracite field during 1919. These figures include a large amount of overtime earnings that should preferably be omitted. The survey of the bituminous mines was made at a time when the mines were operating from one-half to full time, the actual proportion of full time that the mines were in operation being 73.3 per cent. The figures in the table are twenty-four times the weighted average of the actual earnings for Pennsylvania found for a half month payroll period by the survey, and correspond to an average of 246 days worked during the year.

During the year 1919 there was a strike in the bituminous field of Pennsylvania that disorganized the industry for about two

months. In making the comparison of yearly earnings between anthracite and bituminous workers it is thought preferable to eliminate this strike from the computations. Before the President's Bituminous Coal Commission, the soft coal operators produced figures of days worked in the Pittsburgh thick-vein district and the Pittsburgh thin-vein district for the first ten months of 1919, as follows:

	Days worked first 10 months of 1919.
Pittsburgh thick vein district	217
Pittsburgh thin vein district	197

At this rate, the days worked during a year of twelve months would be for 1919 from 261 to 236, the simple average of which is 248, or substantially the same as the 246 figure in which our computation results.

The above table of bituminous earnings includes also a small number of coke workers in the years 1904 to 1912, inclusive, an occupation that has no parallel in the anthracite industry. The effect of this inclusion is minute, however, as the coke workers form less than 7 per cent. of the total number of bituminous workers, and, as their average wage is not far from the average wage of all the employees, the maximum variation being from 7.16 per cent higher to 7.99 per cent lower than the average wage. The effect of the inclusion of the coke workers is, therefore, less than one-half of 1 per cent.

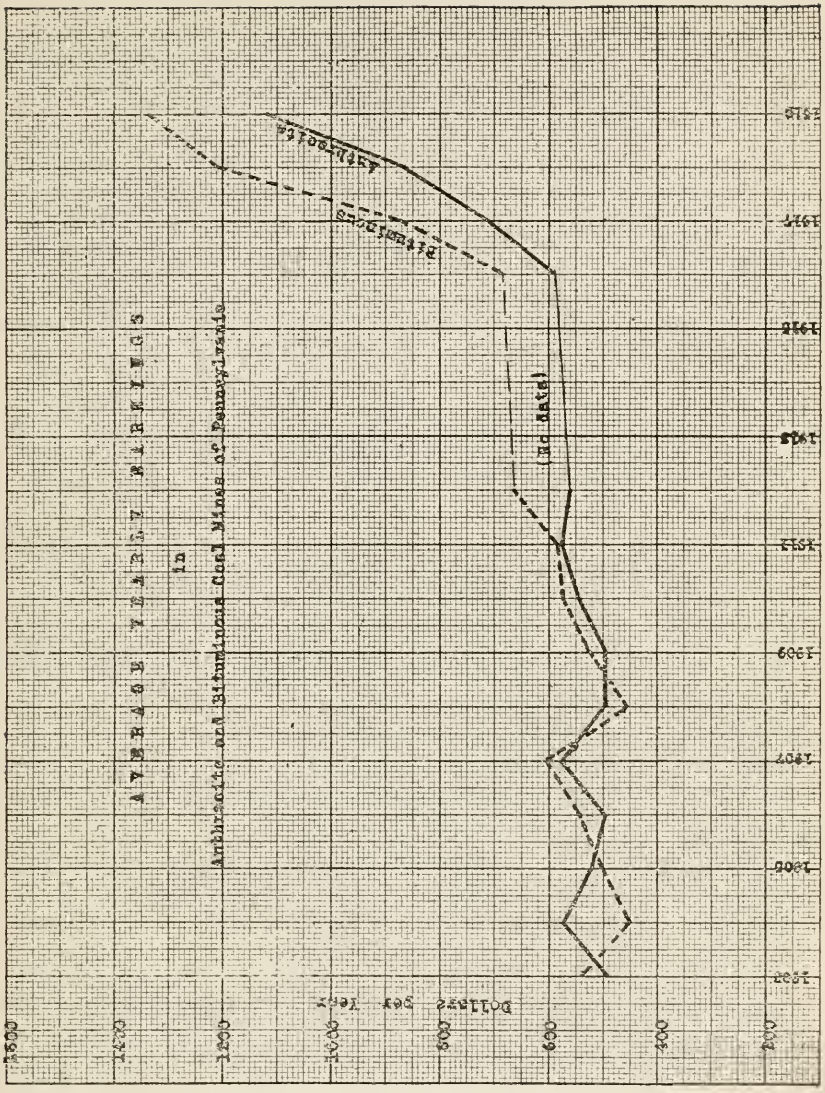
Attention is called to the fact that the anthracite average earnings include those of boys to a greater extent than do the bituminous earnings. This fact makes the table a conservative one, because the fact that is brought out below is that in the early years the anthracite earnings were on an average about the same as the bituminous earnings, whereas in the recent years the bituminous earnings have become considerably greater than the anthracite earnings. The number of boys employed during the early years was much greater than now, and their age (and proportionate earnings) were formerly lower than it now is. Thus if the boys had been omitted from the table, the *relative change* that has taken place between the anthracite and the bituminous earnings would be shown to be greater than is shown in the table. In support of this statement, the following table gives the percentage of boys for the year 1902 (in the collieries of

the Lehigh Coal & Navigation Company, according to the report of the Anthracite Strike Commission) and for the year 1919 (from the report of the Bureau of Labor Statistics of its survey in January, 1919):

	Number of boys.		Per cent of total employees.	
	1902.	1919.	1902.	1919.
Inside mines	114	247	2.227	1.524
Outside mines	761	580	14.864	3.578
Total	875	827	17.091	5.102

Thus during the years when the number of boys was relatively high the earnings of the two fields were about the same, while for the years when the number of boys was low the anthracite earnings (which include the earnings of these boys) was lower than the bituminous earnings, so if the boys were omitted from the total average, the relative change that has taken place would be, as stated above, greater than is shown in the table.

The figures in the table are shown graphically in the following chart:



It is evident that from 1903 to 1911 the earnings in the anthracite mines were approximately the same as they were in the bituminous mines of Pennsylvania. Sometimes one is higher, and sometimes the other. In recent years, however, the bituminous earnings have been considerably higher than in the anthracite mines, the average exceeding the anthracite average by the following yearly amounts:

	Amounts and percentages by which yearly average earnings in the bituminous mines of Pennsylvania exceed the yearly average earnings in the anthracite mines.	
	Amounts.	Percentages.
1916	$ 99	16.8
1917	164	23.0
1918	353	40.9
1919	211	18.7

Thus in order to raise the earnings of the anthracite workers to the same level as that of the bituminous workers on the basis of the number of days worked in the respective fields during 1919, it would be necessary to increase the basic rates in the anthracite mines by 18.7 per cent.

The recent increase awarded to the bituminous mine workers by the President's Bituminous Coal Commission was stated by that Commission to be an average of about 27 per cent (the award amounted to between 27 per cent and 34 per cent for the miners and to 20 per cent for the day men). In order, then, to bring the existing anthracite rates up to the level of the bituminous rates as thus increased, it would be necessary to increase the present anthracite rates by 18.7 per cent, and then by 27 per cent on top of that, or a total increase of 50.74 per cent.

Subdividing the mine workers into groups of occupations, the average yearly earnings for each group from 1903 to 1912 is shown by the following two tables:

AVERAGE YEARLY EARNINGS PENNSYLVANIA ANTHRACITE MINES.

	1912	1911	1910	1909	1908
Miners	729	744	711	651	673
Miners' laborers	496	510	468	441	387
Other inside men	541	558	526	489	505
Boys—inside	286	272	182	220	229
Outside workmen	527	535	541	482	500
Breaker employees	358	374	329	323	329
Boys—outside	242	232	209	192	206
Average	560	573	544	498	496

AVERAGE YEARLY EARNINGS PENNSYLVANIA ANTHRACITE MINES—(Continued).

	1907	1906	1905	1904	1903	1902
Miners	717	641	690	685	701	496
Miners' laborers	489	421	458	462	447	...
Other inside men	574	463	530	781		
Boys—inside	267	241	248	241	461	363
Outside workmen	558	494	543	542	480	306
Breaker employees	422					
Boys—outside	278	351	287	277	284	...
Average	574	494	521	574	491	...

AVERAGE YEARLY EARNINGS PENNSYLVANIA BITUMINOUS MINES.

	1912	1911	1910	1909	1908
Miners—pick	674	573	588	524	447
Miners—machine	654	554	537	507	447
Other inside men (over 16)	709	659	641	564	592
Other inside boys (under 16)	421	293	254	251	275
Outside men (over 16)	631	615	518	529	539
Outside boys (under 16)	314	259	277	216	169
Coke workers	610	553	538	501	424
Average	663	584	574	524	458

AVERAGE YEARLY EARNINGS PENNSYLVANIA BITUMINOUS MINES—(Continued).

	1907	1906	1905	1904	1903	1902
Miners—pick	602	519	491			
Miners—machine	540	496	495	443	538	504
Other inside men	721	666	525	488	474	547
Other inside boys	256	223	221	173	223	...
Outside men	650	624	525	488	530	454
Outside boys	425	212	222	176	240	...
Coke workers	586	570	539	445	...	...
Average	604	545	503	452	541	...

The figures in the above two tables are from the reports of the Pennsylvania State Department of Internal Affairs.

It should be noted that the earnings of the anthracite miners exceeded each year the earnings of the bituminous miner, both pick and machine, the percentage difference being as follows:

Year.	Percentage by which yearly earnings of anthracite miner formely exceeded yearly earnings of bituminous pick miner.
1903	30.3
1904	54.6
1905	40.5
1906	23.5
1907	19.1
1908	50.5
1909	24.2
1910	20.9
1911	29.8
1912	10.0
Simple average	30.3

If the work done by the anthracite contract miner and the bituminous pick miner is at all comparable, it seems as though the anthracite miner necessarily requires more experience and skill. Nevertheless, the anthracite miner has lost the differential in earnings that he formerly possessed, as is shown by a study made by the United States Bureau of Labor Statistics in June, July and August of 1918. At that time it was found that the average earnings per day that the mine is open (per "start") of the anthracite contract miner was $5.62. The correctness of this figure was checked by inquiries, made of the principal anthracite companies of Pennsylvania, asking for a statement of the number of contract miners employed in all the collieries of each company and the average net earnings per "start"—that is, the earnings after deductions for mine supplies and blacksmithing. Returns were received from 69 companies, representing 33,395 contract miners. The average earnings for all of these 69 companies was $5.59, against $5.62, as shown by the data collected by the Bureau's agents.

In November, 1918, an increase was granted in the contract rates of the anthracite mines amounting to 12 per cent, and this 12 per cent raised the average earnings of $5.59 to $6.26.

The study of the Bureau was also extended to the bituminous field of Pennsylvania, and it was found that the average earnings of the bituminous pick miner was $6.22, or substantially the same as the earnings of the anthracite contract miner after the increase of November, 1918, so the anthracite contract miner, instead of receiving greater earnings than the bituminous miner, as he did through all the years from 1903 to 1912, was in 1919 on substantially the same basis per day, while, owing to the award of the President's

Coal Commission, he is now considerably behind the bituminous miner.

The study of the Bureau in 1918 showed the following amounts by which the day men in the bituminous mines exceeded the day men in the anthracite mines. In considering the table it should be noted that there are more unskilled outside workers in proportion in the anthracite than in the bituminous industry, and that it is these men who are the most behind the bituminous scale, though formerly their yearly earnings were about on an equality.

COMPARISON OF DAILY EARNINGS IN 1918 OF ANTHRACITE AND BITUMINOUS MINE WORKERS.

	Anthracite. average.	Bituminous. average.	Average bituminous exceeds average anthracite.	
			Amount.	Percentage.
Outside:				
Blacksmiths	$3.44	$4.96	$1.52	44
Carpenters	3.39	4.89	1.50	44
Hoisting engineers	3.55	4.80	1.25	35
Stationary engineers	3.03	4.93	1.90	63
Power engineers	3.53	4.93	1.40	40
Locomotive engineers	3.25	4.90	1.65	51
Firemen	3.12	4.60	1.48	48
Footmen and headmen	2.77	5.00	2.23	81
Jig runners	2.52	4.67	2.15	85
Laborers	2.78	4.24	1.46	53
Machine repairmen	3.43	4.67	1.24	36
Slaters (boys)	1.89	2.65	.76	40
Stablemen	3.02	4.10	1.08	36
Teamsters	2.82	3.86	1.04	37
Trackmen	2.95	4.89	1.94	65
Drivers	2.47	5.00	2.53	102
Inside:				
Blacksmiths	3.66	4.96	1.30	35
Bratticemen & carpenters	3.46	5.00	1.54	45
Door boys	1.95	2.68	.73	37
Drivers	2.87	5.00	2.13	74
Engineers, locomotive	3.46	5.10	1.64	47
Slope engineers	3.26	5.10	1.84	56
Footmen and headmen	3.05	5.00	1.95	64
Laborers	3.22	4.77	1.55	48
Machine repairmen	3.48	4.67	1.19	34
Company miners	3.71	5.00	1.29	35
Pipemen	3.38	4.92	1.54	46
Pumpmen	3.45	5.51	2.06	60
Car runner	3.11	4.77	1.66	53
Stablemen	3.41	4.10	.69	21
Timbermen	3.60	5.00	1.40	39
Track layers	3.55	5.00	1.45	41

This table of the Bureau of Labor Statistics is not a weighted average, but is a mean between the high and the low rates. The correctness of the Bureau's figures, however, is evidenced by the estimate it made of the 1918 earnings of the contract miner, which later investigation checked, as stated above, within three cents per day.

The above differences between the daily earnings in the two industries fully explain the difference of 40.9 per cent that was shown above to exist in 1918 by the figures of the State Workmen's Compensation Commission. In this connection, it is well to remember that the day men in the anthracite and in the bituminous industries are fairly comparable in their work, though there is, of course, little comparison that can be made in the occupations of miner. Thus there is every reason why the anthracite day man should expect to receive as high a wage as the day man in the bituminous field, and at the same time it is entirely reasonable for the anthracite contract miner to feel that he is entitled to receive as much higher earnings than the bituminous pick miner as he was accustomed to get during the pre-war years from 1903 to 1912.

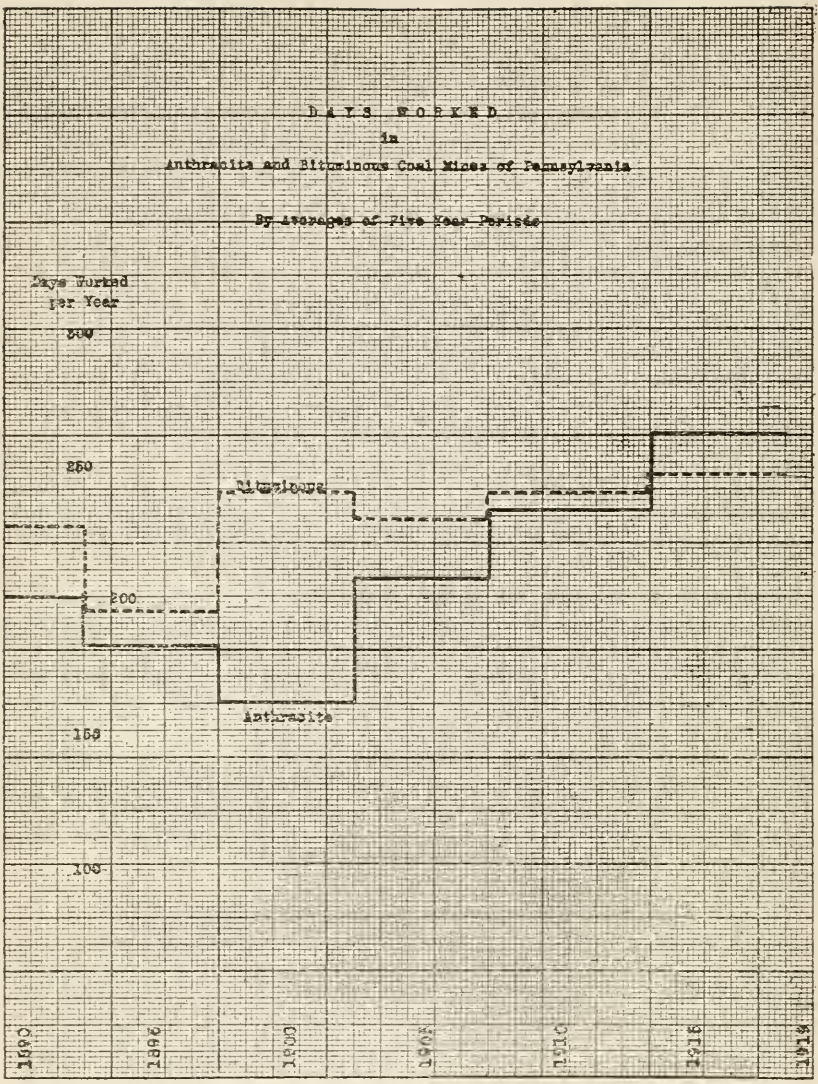
The wage adjustment that was made in November, 1918, added about a dollar a day to the earnings of the anthracite day men. This reduces, as of the year 1919, the amounts by which the bituminous earnings exceed the anthracite earnings by an equal amount. This cuts down the per cent excess of the bituminous men and accounts for the reduction, found above, in the excess that bituminous yearly earnings exceeded anthracite yearly earnings (this reduction was from 40.9 per cent in 1918 to 18.7 per cent in 1919).

Days Worked.

Before the start of the war in 1914 the average days worked in the Pennsylvania bituminous mines exceeded the days worked in the anthracite mines. This is shown in the table below, and graphically in the following chart. The figures are taken from reports of the United States Geological Survey.

DAYS WORKED IN ANTHRACITE AND BITUMINOUS FIELDS.

	Pennsylvania anthracite		Pennsylvania bituminous		Per cent by which anthracite days worked is lower than bituminous
1890	200		232		
1891	203		223		
1892	198		223		
Average for period		200.3		226.0	13%
1893	197		190		
1894	190		165		
1895	196		206		
1896	174		206		
1897	150		205		
Average for period		181.4		194.2	7%
1898	152		229		
1899	173		245		
1900	166		242		
1901	196		230		
1902	116		248		
Average for period		160.6		238.8	49%
1903	206		235		
1904	200		196		
1905	215		231		
1906	195		231		
1907	220		255		
Average for period		207.2		229.6	11%
1908	200		201		
1910	229		238		
1911	246		233		
1912	231		252		
1913	257		267		
Average for period		232.6		238.2	3%
1914	245		214		
1915	230		226		
1916	253		259		
1917	285		261		
1918	293		269		
Average for period		261.2		245.8	
1919 Estimated	252		...		



With the exception of the five-year period from 1914 to 1918, inclusive, the average of days worked during every five-year period back to 1890 in the bituminous field exceeds the average in the anthracite field. The 1919 figures of days worked in the Pennsylvania bituminous field, ignoring the strike, was about 248, but the anthracite figure dropped from the 1918 high point of 293 to 252.

It is probable that with the coming of normal conditions the pre-war comparison between the two fields will once more be restored, though it is not to be expected that the difference will be as great as existed prior to 1903 (that is, prior to the introduction of the summer discount in the anthracite market). If this is the case, then, the average number of days worked in the anthracite field may be expected to be lower than in the bituminous field by from 3 per cent to 11 per cent.

The day rates in the anthracite field, then, should be from 3 per cent to 11 per cent higher than in the bituminous field. Formerly they were higher, but now they are decidedly lower.

Day Rates.

The table below gives the average daily wages in the two fields from 1903 to 1912, inclusive, as reported by the Pennsylvania State Department of Internal Affairs:

AVERAGE DAILY WAGE—PENNSYLVANIA ANTHRACITE MINERS.

	1912	1911	1910	1909	1908
Miners	3.54	3.19	3.15	3.06	3.03
Miners' laborers	2.40	2.19	2.07	2.07	1.74
Other inside men	2.63	2.40	2.33	2.30	2.27
Boys—inside mine	1.39	1.17	.81	1.03	1.03
Outside workmen	2.56	2.30	2.40	2.26	2.25
Breaker employees	1.74	1.61	1.45	1.52	1.48
Boys—outside	1.17	1.00	.93	.90	.93
Average	2.72	2.46	2.41	2.34	2.23

AVERAGE DAILY WAGE—PENNSYLVANIA ANTHRACITE MINERS—(Continued).

	1907	1906	1905	1904	1903	1902
Miners	2.95	3.09	2.97	2.96	2.96	2.83
Miners' laborers	2.01	2.03	1.97	2.00	1.89	....
Other inside men	2.36	2.24	2.29	3.38		
Boys—inside mine	1.10	1.16	1.07	1.05	1.94	2.10
Outside workmen	2.30	2.38	2.34	2.34	2.03	1.73
Breaker employees	1.74					
Boys—outside	1.15	1.69	1.24	1.20	1.20	....
Average	2.36	2.39	2.24	2.48	2.07	....

AVERAGE DAILY WAGE—PENNSYLVANIA BITUMINOUS MINERS.

	1912	1911	1910	1909	1908
Miners—pick	2.52	2.31	2.26	2.01	1.90
Miners—machine	2.44	2.24	2.04	2.01	1.88
Other inside men (over 16)	2.65	2.66	2.24	2.16	2.49
Other inside boys (under 16)	1.57	1.18	.96	.96	1.15
Outside men (over 16)	2.35	2.48	1.97	2.07	2.26
Outside boys (under 16)	1.17	1.04	1.04	.83	.71
Coke workers	2.07	2.23	2.23	1.92	1.78
Average	2.48	2.35	2.19	2.00	1.93

AVERAGE DAILY WAGE—PENNSYLVANIA BITUMINOUS MINERS—(Continued).

	1907	1906	1905	1904	1903	1902
Miners—pick	2.24	2.53	2.18			
Miners—machine	2.01	2.41	2.20	2.17	2.29	2.16
Other inside men	2.31	3.25	2.33	2.39	2.45	2.24
Other inside boys	.95	1.09	.93	.85	95	....
Outside men	2.42	3.04	2.33	2.39	2.26	1.87
Outside boys	1.58	1.03	.98	.86	1.02	....
Coke workers	2.19	2.04	2.06	2.05	....	....
Average	2.25	2.66	2.21	2.26	2.31	....

As seen in this table, the daily wage of the anthracite miner was higher than that of the bituminous miner, while in the other occupations the anthracite wage is either higher or else fluctuates, being sometimes higher and sometimes lower.

As contrasted with this, the average hourly earnings, as found in 1919 by the survey of the United States Bureau of Labor Statistics, are given below:

ANTHRACITE.

Occupation	Average earnings per hour	
Inside:		
Blacksmiths	$0.592	
Brattice men	.561	
Cagers	.517	
Car runners	.507	
Company miners	.581	
Company miners' laborers	.526	
Consideration miners	.636	
Contract miners	.842	
Contract miners' laborers	.639	
Door tenders (boys)	.315	
Drivers	.499	
Engineers	.542	
Laborers	.518	
Machinists	.568	
Masons	.577	
Motormen	.558	
Motor brakemen	.502	
Pumpmen	.413	
Timbermen	.695	
Trackmen	.570	
Total inside occupations	.673	
Outside:		
Ashmen	.444	
Blacksmiths	.572	
Cagers	.458	
Carpenters	.560	
Car runners	.454	
Dumpers	.449	
Engineers	.532	
Firemen	.503	
Laborers	.434	
Loaders	.448	
Machinists	.517	
Oilers	.434	
Repairmen	.485	
Timber cutters	.452	
Trackmen	.477	
Outside Breaker:		
Jig runners	.410	
Platemen	.430	
Slaters (boys)	.298	
Total outside occupations		.442
Grand total, inside and outside occupations		.617

PENNSYLVANIA BITUMINOUS.

Drivers	.634
Laborers, inside	.599
Laborers, outside	.516
Loaders	.835
Miners, hand	.902
Miners, machine	.913
Trackman	.628

In every occupation given, the bituminous hourly earnings are considerably higher than the anthracite.

The basic day rates from the agreements of the two industries are as follows:

Occupation.	Anthracite.	Bituminous. (1919 rates)
Inside:		
Semi-skilled	$4.00 to $4.50	$4.75
Skilled	4.50	5.00
Company miners	4.75	....
Company miners' laborers	4.50	....
Outside:		
Common labor	3.31	4.10
Semi-skilled	4.25	4.75
Skilled	4.25	5.10

In more detail, these rates are:

ANTHRACITE.

Occupation.	Percentage.
Districts 1 and 9:	
Company miner	4.73
Company miner-laborer	4.38
Inside laborer	4.236
Outside laborer	3.567
Carpenter, first class	4.633
Carpenter helper	3.727
Blacksmith, first class	4.732
Blacksmith, helper	3.688
Ashmen	3.611
Slate pickers, first class, men	2.713
Bratticemen	4.401
Trackmen, inside	4.737
Trackmen helpers	4.167
District 7:	
Inside—	
Day wage miners	4.60
Day wage laborers	4.25
Skilled labor	4.50
Semi-skilled	4.35
Outside—	
Common labor	3.31
Semi-skilled	4.25
Skilled	4.25

BITUMINOUS (Pennsylvania, 1919 rates).

Occupation.	Percentage.
Inside:	
Track layers	5.00
Track layer helpers	4.75
Trappers	2.65
Drivers	5.00
Timbermen	5.00
Pipemen	4.92
Wiremen	5.00
Motormen	5.10
Bottom cagers	5.00
Trip riders	5.00
Water and machine haulers	5.00
All other inside	4.75
Outside:	
Dumpers	4.42
Trimmers	4.36
Ram operators	4.60
Pushers	4.18
Car cleaners	4.10

Summary.

As it is probable, judging the future by the past, that the average days worked in the anthracite field will be from 3 per cent to 11 per cent lower than the average number of days worked in the Pennsylvania bituminous field, the anthracite worker, on this basis alone, should receive a wage rate from 3 per cent to 11 per cent higher than the bituminous wage rate for the corresponding occupation in order that his yearly earnings may equal the yearly earnings in the bituminous field.

The occupations that are the more nearly comparable in the two fields are those of the day men, especially outside the mines. In the years from 1903 to 1912 the yearly earnings of these men in the two fields was substantially the same, sometimes the one field being higher, sometimes the other. From 1916 on the yearly earnings of the day men in the bituminous field increased faster than did those in the anthracite field.

In 1918 the bituminous rate was 40 per cent or more in excess of the anthracite rate. This difference in rates was somewhat balanced by the fact that in 1918 the anthracite men worked an abnormal number of days. The November, 1918, anthracite adjustment reduced the difference between the two fields to about 15 per cent

or 20 per cent, but this difference has been recently increased by the bituminous award of 20 per cent to the day men to a total difference between the two fields of about 40 per cent to 50 per cent.

With the bituminous day rates for the day men between 40 per cent and 50 per cent higher than the anthracite day rates, and with the probability that the days worked per year will be slightly lower in the anthracite field than in the Pennsylvania bituminous field, it is evident that the present anthracite day rates should be increased a substantial amount if the old equality between the two fields is to be restored, and the anthracite day men be allowed yearly earnings somewhat similar in amount to the yearly earnings of the bituminous day men.

The anthracite miner during the years 1903 to 1912 received yearly earnings considerably in excess of the yearly earnings of the bituminous miner, the average (unweighted) excess during the year in question being about 30 per cent. His daily earnings in 1918 amounted to about 12 per cent less than the daily earnings of the bituminous pick miner (which was, however, nearly balanced by the abnormal number of days during that year that the anthracite mines worked). The November, 1918, anthracite wage adjustment placed the daily earnings of the miners in the two fields about equal, but the bituminous award, which amounted to about 27 per cent to the Pennsylvania pick miner, has again placed the bituminous miner ahead by that much.

Thus, even assuming that the same number of days may be expected per year in the two fields, the anthracite miner should now receive a 27 per cent increase in his rates, just to place him even with the bituminous miner, and above that, if the former differential is to be restored, he should receive an additional increase of about 30 per cent, or a total increase of 65 per cent in all. This figure checks very closely with the 60 per cent increase found necessary in another exhibit to restore to the anthracite contract miner the purchasing power he formerly possessed.

BEFORE THE UNITED STATES ANTHRACITE COAL COMMISSION

EMPLOYES EXHIBIT NUMBER 6

IRREGULARITY OF EMPLOYMENT IN THE ANTHRACITE INDUSTRY

Presented by
W. JETT LAUCK

On behalf of

John L. Lewis, President
Philip Murray, Vice-President
F. P. Hanaway, International Representative
Percy Tetlow, Statistician

John Dempsey
Thomas Kennedy
Chris. J. Golden
} Committee Representing Districts 1, 7 and 9

Of the

United Mine Workers of America

WASHINGTON
1920

This exhibit was prepared under the
supervision of
W. JETT LAUCK
by Leland Olds

BEFORE THE UNITED STATES ANTHRACITE COAL COMMISSION

EMPLOYES EXHIBIT NUMBER_____

IRREGULARITY OF EMPLOYMENT IN THE ANTHRACITE INDUSTRY

Presented by

W. JETT LAUCK

On behalf of

United Mine Workers of America

WASHINGTON

1920

A

TABLE OF CONTENTS

IRREGULARITY OF EMPLOYMENT IN THE ANTHRACITE INDUSTRY

GENERAL SURVEY.

In the coal mining industry the degree of regularity of operation is today as important a factor in earnings as is the level of hourly rates. As the industry operates on part time basis, the health of the family depends upon annual earnings, which are the product of the hourly rate by the number of hours of actual employment. In determining rates of pay, therefore, it is important to form an estimate as to the probable number of days during which the worker will have an opportunity to earn the rate set.

Data are available as to the number of days worked in the anthracite industry covering the period since 1881. During this period the variation has been very great. This variation is shown graphically on the accompanying table. The greatest number of days worked was 293 in the abnormal year 1918, while 1902, the year of the great anthracite strike, shows only 116 days of operation. For more normal years the greatest number of days worked was 257, in 1913, while the lowest point came in 1897, with only 150 days of operation.

A careful examination of the data presented in this report would seem to point to the following general conclusions in regard to the anthracite coal industry:

(1) The anthracite mine workers have suffered more from irregularity of employment than have the bituminous mine workers. Not only is the average number of working days in anthracite lower than in bituminous mines, but the extremes are greater.

During the period since 1881 the anthracite workers have had an opportunity to work on an average only 212 days out of each year. This means 92 days of idleness, 30 per cent of the working year, during which they have no opportunity to earn a living wage. In obtaining this average the abnormally low figure for 1902 due to the protracted strike has been left out, but the abnormally high figures for 1917 and 1918 have been included. Were the figure for 1902 included, the average for anthracite would be even lower.

This average, 212 working days, compares with 229 days of operation in the bituminous mines of Pennsylvania, and with 216 in those

of the entire country. The bituminous figures represent averages for the period since 1892. If figures for the same period for anthracite had been averaged, the days worked would be found to be 210. Comparison with Pennsylvania bituminous is fairer because all the anthracite fields of major importance are in that State.

(2) Shortage of labor does not enter appreciably into this problem of a part-time industry, the chief difficulty having been oversupply of labor as well as of capital. The sufferings of the workers from unemployment may be directly traced to a bad policy of investment during the days of unregulated competition. This has not only injured the worker, but has also rendered high prices unavoidable.

(3) The problem of car shortage as a cause of irregularity, so much in evidence in the bituminous industry, has played so small a role in the anthracite industry as to be almost negligible.

(4) The fundamental cause of irregularity has been "no market." In other words, the equipment and labor force have been more than adequate to produce the supply which the market has been ready to absorb. The anthracite market has become primarily that of a domestic fuel. The determining factors in this market are, therefore, weather and growth of population. Other fuels are beginning to compete with anthracite in its own domestic sphere. In order to estimate the probable number of days which will be averaged in future years, it will be necessary to form a judgment as to the probable future of the market in relation to possible production. From this and from data for the last decade it would appear that the market for anthracite in the future will remain in a state of equilibrium at about the level for the years 1910 to 1916, inclusive. In other words, growth of population seems to be about balanced by the increasing competition of other fuels.

(5) This will mean that the maximum average days per year which may fairly be expected will be about 242, leaving the worker to face unemployment for 20 per cent of the working year. From the consideration of other factors, discussed more at length in the following pages, this would appear to be a conservative estimate, the probability being that there will be more idle days rather than less.

(6) It is probable that had there not been overinvestment in the anthracite industry, the problem could have been met by reducing the hours of labor without adding to the present price of anthracite coal.

I.

NUMBER OF DAYS WORKED IN COAL INDUSTRY, 1881 TO 1919.

The following table affords a comprehensive survey of the entire problem. It will serve as a guide to the subsequent tables which consider the problem in greater detail.

The data for this table are taken from Bulletin 115 of the Department of the Interior, Bureau of Mines, Tables 124 and 126, supplemented by material in the annual report on coal in the "Mineral Resources of the United States" and in recent reports of the United States Geological Survey.

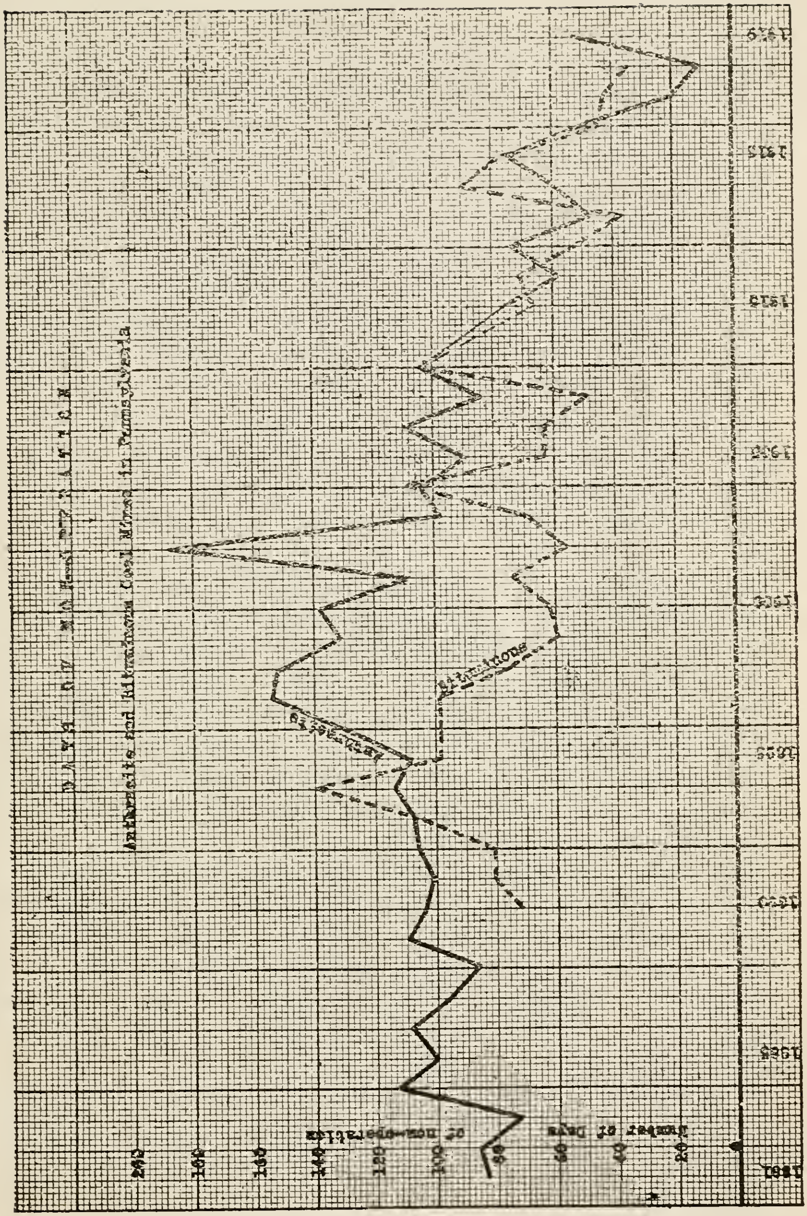
DAYS WORKED IN THE ANTHRACITE COAL INDUSTRY, TOGETHER WITH OTHER DATA FOR COMPARISON.

Year.	Anthracite.				Bituminous.	
	No. men employed.	Av. tonnage per man— day.	Av. tonnage per man— year.	Days worked.	Days worked— Penna.	Days worked— U. S.
1881	76,031	1.90	420	221	...	...
1882	82,200	1.96	427	218	...	...
1883	91,421	1.81	421	232	...	...
1884	101,073	1.92	368	192	...	...
1885	100,324	1.87	382	204	...	...
1886	103,044	1.93	379	196	...	...
1887	106,517	1.90	395	208	...	...
1888	122,218	1.75	381	218	...	...
1889	123,676	1.90	368	194	...	...
1890	126,000	1.85	369	200	232	226
1891	126,350	1.98	401	203	223	233
1892	129,050	2.06	407	198	223	219
1893	132,944	2.06	406	197	190	204
1894	131,603	2.08	395	190	165	171
1895	142,917	2.07	406	196	206	194
1896	148,991	2.10	365	174	206	192
1897	149,884	2.34	351	150	205	196
1898	145,504	2.41	367	152	229	211
1899	138,608	2.50	433	173	245	234
1900	144,206	2.40	398	166	242	234
1901	145,309	2.37	464	196	230	225
1902	148,141	2.41	279	116[1]	248	230
1903	150,483	2.41	496	206	235	225
1904	155,861	2.31	469	200	196	202
1905	163,406	2.19	470	215	231	211
1906	162,355	2.25	439	195[1]	231	213
1907	167,234	2.33	512	220	255	234
1908	174,174	2.39	478	200	201[1]	[1]193
1909[3]	.....	....	...	...	...	...
1910	169,497	2.17	498	229	238	217
1911	173,940	2.11	520	246	233	211
1912	174,030	2.10	485	231[1]	252	233
1913	175,745	2.03	521	257	267	232
1914	179,679	2.06	505	245	214[1]	[2]195
1915	176,552	2.19	504	230	226	203
1916	159,869	2.16	548	253	259	230
1917	154,174	2.27	646	285	261	243
1918	147,121	2.28	672	293	269	249
1919	.....	....	...	252-262[2]	...	[2]208
Average for entire period				212	229	216

[1] Years when there were important stoppages of work pending adjustment of wages, etc.

[2] Estimated.

[3] No data for 1909.


DAYS OF NON-OPERATION
Anthracite and Bituminous Coal Mines in Pennsylvania
Anthracite
Bituminous
Number of Days of non-operation

A cursory glance at this table might lead to the conclusion that irregularity has been largely eliminated. Beginning with the year 1900, a steady improvement is evident, which apparently culminates in the year 1918 with 293 days of employment. From this it might be concluded that with the growth of population the industry has achieved what is practically a full working year. Such a judgment would fail to take account of the actual interplay of forces determining the number of days work. A more thorough study covering the 30-year period ending with the present year will show clearly that the climax of this tendency toward regularity was reached in the years 1910 to 1916, when the mines were operated only 80 per cent of the year, and that the years 1917 and 1918 were abnormal. Today a readjustment to the normal of the years 1910 to 1916 is in process.

In general, a study of this 30-year period makes it possible to see the extent to which a thoroughly anti-social business policy has plunged the anthracite industry into a vicious circle, which will mean the perpetuation of a certain degree of irregularity in employment.

In this table, and throughout the exhibit, the comparison emphasized is that between the number of days worked in anthracite and the number worked in the Pennsylvania bituminous mines. This is done because of the similarity in determining factors between these two fields. Figures are also shown for the bituminous industry for the country as a whole. But it should be pointed out that, whatever comparison with the less comparable regions of the country may show, this will not in any sense vitiate the conclusions drawn from the comparison which is stressed.

Pennsylvania bituminous mines are more comparable with the anthracite industry than are the other bituminous regions of the country not only from the human standpoint, but also from the point of view of market conditions, which tend to determine relative regularity of conditions. In both branches of the Pennsylvania mining industry the element of uncertainty characteristic of a competitive market has been largely eliminated.

From the table above it appears that there are four periods which seem subject to slightly different influences so far as regularity of employment in anthracite is concerned. During the years 1881 to 1891, inclusive, the days worked averaged over 200. Then followed a decade in which the average fell off approximately 30 days, the low point being reached in 1897. During the years immediately following the great strike of 1902 the number of days worked approximated

the average for the 80s, while the decade ending with the present shows a steady improvement. Except for the two abnormal years 1917 and 1918, the average for this decade would appear to be about 243 days of operation to the year, which may probably be taken as a fair index of the present problem in the anthracite industry. This means some 61 days of idleness, or 20 per cent of the working year, in which the anthracite worker, through no fault of his own, is unable to earn a living.

But the chief interest is in the future. Analysis of the past is only to give some basis for estimating the future. In order to gauge whether this average is likely to persist, or whether the decline which followed the abnormal years of war demand is likely to go on until the industry has returned to earlier conditions of greater irregularity, it will be necessary to consider previous periods more closely.

II.

DETAILS OF DAYS WORKED FOR PERIOD 1881 TO 1891.

The following table is drawn to show the factors influencing days worked for the period 1881 to 1891. (Sources as mentioned above.)

DETAILS OF DAYS WORKED FOR PERIOD 1881 TO 1891.

Year.	Anthracite.				Bituminous.
	No. men employed.	Av. tonnage per man— day.	Av. tonnage per man— year.	Days worked.	
1881.....	76,031	1.90	420	221	
1882.....	82,200	1.96	427	218	
1883.....	91,421	1.81	421	232	
1884.....	101,073	1.92	368	192	
1885.....	100,324	1.87	382	204	
1886.....	103,044	1.93	379	196	(No data prior to 1890)
1887.....	106,517	1.90	395	208	
1888.....	122,218	1.75	381	218	
1889.....	123,676	1.90	368	194	
1890.....	126,000	1.85	369	200	
1891.....	126,350	1.98	401	203	
Average.....	.....	.....	.....	208	

The outstanding feature of this table is the rapid increase in the number of men employed in the anthracite industry. In the course of 10 years approximately 66 per cent were added to the number employed in 1881. Between 1882 and 1883 the number increased by nearly 10,000. A similar increase was registered in the following year, while between 1887 and 1888 over 15,000 men were added to the army of anthracite workers. Meanwhile, with slight variations, the production per man per day remains almost constant. On the other hand, the anthracite production of the country increased, but not as rapidly as the working force. The consequence was a steady decrease in the number of days worked.

These facts indicate that the anthracite industry was passing through the speculative period. The rapid growth of population and the cheapening of transportation caused a rapid development of the trade. The development of the West accentuated this increase in demand. Anthracite was looked upon as a good thing in the way of investment. The consequence was rapid expansion, the construc-

tion of new collieries and the building of storage yards. This caused the increase in the number of anthracite workers. But, as is generally the case, this period of competitive speculation caused production to increase beyond what the market could absorb. Consequently the steady increase in the number of days of non-operation, which was to reach a climax in the 90s, had begun. Attempts to control production in order to keep the price up proved futile. The industry was not yet ready for large combination. E. W. Parker, in "Mineral Resources of the United States," 1889-90, comments upon the situation as follows:

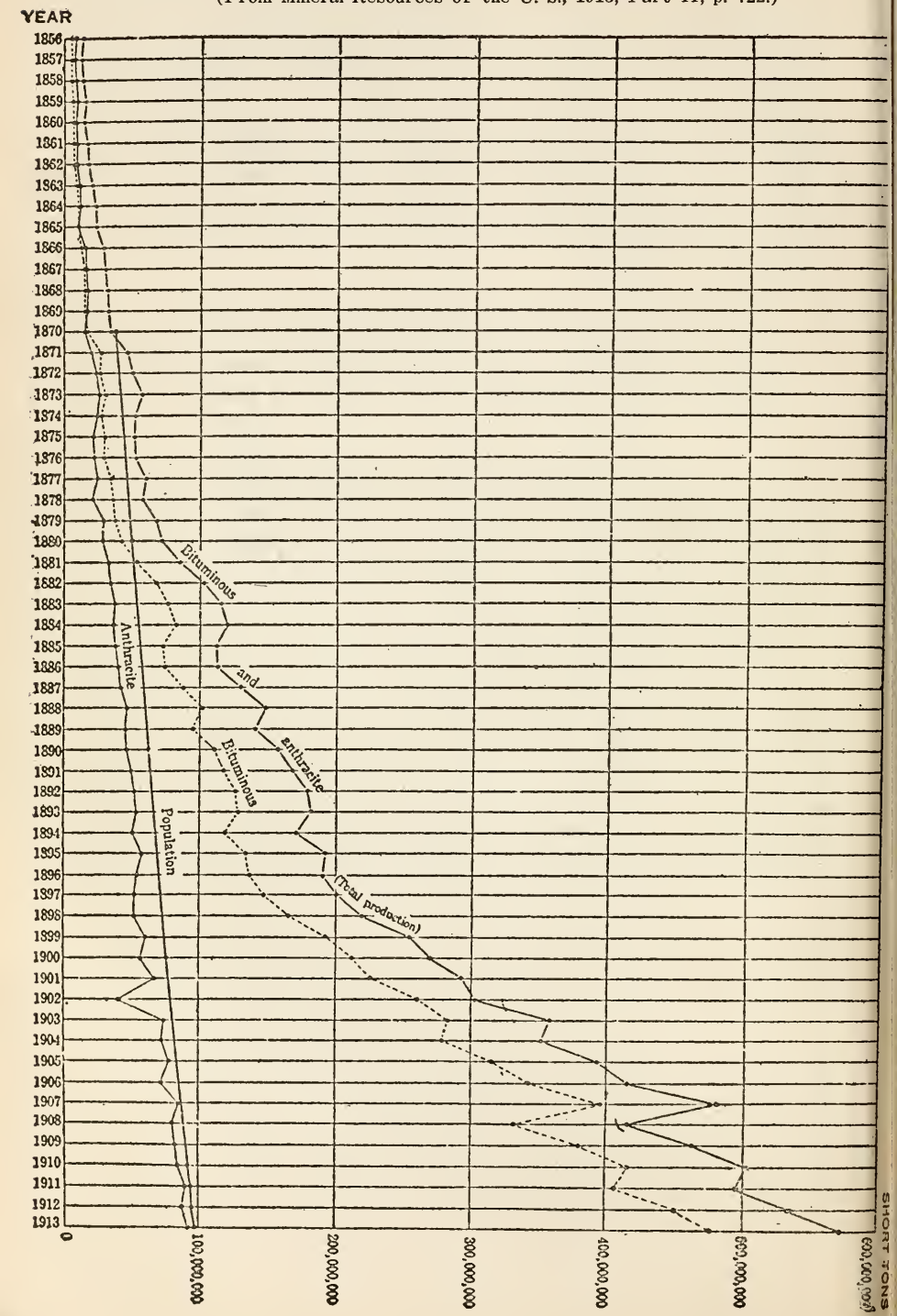
> "The average number of days worked during the year 1889 by the collieries was 194. The suspension of mining during periods aggregating about one-third of the year was caused mainly by the inability of the market to absorb a larger product." (P. 243.)

Thus, early in the history of the trade, "no market" was the chief cause of irregularity of employment. But it must be remembered that this was not due to irregularity in the market, but to overinvestment in the industry. This fact of overinvestment has been a continuing influence since that time, and has been one of the principal causes of the low *yearly* earnings of the anthracite workers.

During this period 1881-1891, anthracite had not been completely ruled out as industrial fuel. Consequently, investors counted upon the expansion of the market paralleling the expansion of industry. As a matter of fact, this has been the case with the bituminous market. Anthracite, on the other hand, soon became almost entirely a domestic fuel, its place in industry being taken by bituminous coal and coke. As a result, the expansion of the anthracite market has tended more and more to parallel the development of population.

DIAGRAM SHOWING THE TENDENCY OF ANTHRACITE COAL PRODUCTION TO PARALLEL GROWTH OF POPULATION DURING YEARS 1856-1913, CONTRASTED WITH INCREASE IN PRODUCTION OF BITUMINOUS COAL AS INDUSTRIAL FUEL.

(From Mineral Resources of the U. S., 1913, Part II, p. 722.)



III.

PERIOD OF OVERPRODUCTION, 1892 to 1901.

The full effects of the tendency mentioned in the preceding section were not apparent until the last decade of the nineteenth century. Then the results of unchecked competition for expected profits appeared in unemployment and high costs, which rendered the situation even worse. The industry was operating in a vicious circle. Too much capital invested meant that the production had to carry so heavy an overhead that it could not compete for a market which bituminous was grabbing. Too many workers meant that the days of operation would have to be drastically curtailed. To meet this decrease in the opportunity to earn a living, the workers drove themselves to the limit to produce more per day, which only operated further to decrease the number of days worked. It was a situation which made the strike of 1902 inevitable. The development of the anthracite industry had been very badly managed. Not alone physical, but human resources were wasted. The following table tells the story, the sources being as mentioned above:

Year.	Anthracite.				Bituminous.	
	No. men employed.	Av. tonnage per man— day.	Av. tonnage per man— year.	Days worked.	Days worked— Penna.	Days worked— U. S.
1892.....	129,050	2.06	407	198	223	219
1893.....	132,944	2.06	406	197	190	204
1894.....	131,603	2.08	395	190	165	171
1895.....	142,917	2.07	406	196	206	194
1896.....	148,991	2.10	365	174	206	192
1897.....	149,884	2.34	351	150	205	196
1898.....	145,504	2.41	367	152	229	211
1899.....	138,608	2.50	433	173	245	234
1900.....	144,206	2.40	398	166	242	234
1901.....	145,309	2.37	464	196	230	225
Average,....	.....	.....	.....	179	214	208

The outstanding fact in the above table is that the anthracite mine workers, through no fault of their own, were forced to be idle an average of 125 working days per year during the whole decade. Second only in importance to this is the fact that, despite overproduction, the number of workers in the industry continued to in-

crease. Investment in the industry had been so unregulated that the working year amounted to a period of cut-throat competition for the "peak load." To meet this and secure a share of the market which would carry the large investment, the companies kept an oversupply of labor, apportioning the work out among the workers.

Overproduction meant competition and falling prices. To a large extent, the burden fell upon the worker. The market was demoralized. The situation is particularly evident in the figures for the years 1895-1898. An increase of over 10,000 in the number of workers in the industry, combined with the working of a few more days in the year, brought about such a state of oversupply that the market did not recover for a number of years. The number of days worked drops first to 174, then to 150 and 152. Not until 1898 had the number of workers begun to decline. And by that time the operators were taking steps to effect a combination with a view to restraining production. Speaking of this period, in "Mineral Resources of the United States," 1897, E. W. Parker says:

> "In order to accomplish this result the mines were operated only three or four days in the week, but even with this restriction the supply of coal was lessened only about six per cent. It appears singular that with the working time cut down one-fourth or one-third the product is decreased only one-twelfth. The explanation is simple. During the busy season, when the mines are running full time, the miners rarely average as much as five days in the week, usually 'laying off' one or two week-days as well as Sunday. When the mines are running but half or two-thirds time every miner puts in all the time he can, and probably averages more tonnage per day than when he has all the work he wants." (Page 13.)

Later, in the same report, we find the following comment upon the oversupply of labor:

> "It may be opportune to mention at this time the difficulty presented by the labor question in the anthracite regions, viz., the overplus of miners and laborers. Thus, in tables in the beginning of this report it will be noted that although the product fell off over 3,000,000 tons in 1896 as compared with 1895, the total number of employees increased 6,000. It will be seen at once that these men must have worked shorter time. This was the fact, and although wages, measured by day's work, were higher in 1896, it is questionable whether the miners individually benefited to any great extent. It is evident, of course, that there are too many men for the amount of work to be done, but a remedy for the difficulty does not easily present itself.

> While there is any likelihood of work the miners will not leave the vicinity of the mines, and the companies try so to apportion the work as to give all a chance, with the result that there is not enough work for any.
>
> "With a very much larger output this trouble would no doubt adjust itself; but that condition is not in sight in the near future. In the meantime it is a question whether it would not be better for the companies to give their old employees measurably steady employment and drop from the rolls all such as could not be thus provided for, allowing them to seek work elsewhere. (Pages 249-50.)

This solution would not have fitted in with the policy of companies which were, as pointed out, fighting for as large a share of the "peak load" as they could handle. For this it was necessary to have on hand an abundance of cheap labor. In terms of such a market situation, it was to the interest of the competing companies to encourage workers to stay on part-time work. From the above it appears that this policy was definitely pursued.

Other factors were entering into the situation. It was during this period that anthracite became entirely a domestic coal, its market responsive chiefly to changes in the weather, and to growth of population. And it is at this point that one comes face to face with the effect of over-investment. To quote E. W. Parker in "Mineral Resources of the United States" for 1897.

> "Mr. Wm. B. Ruley, in his contribution on the production of Pennsylvania anthracite, cites two reasons which have been assigned for the decrease in anthracite consumption. The first of these is the increased use of bituminous coal in competition with the smaller sizes of anthracite for steam raising; the second is the increased consumption of gas for cooking and other domestic purposes. To this must be added another factor—the decreased production of anthracite pig iron. The output of anthracite pig iron in 1897 was more than 200,000 long tons less than in 1896, while the production of pig iron made from bituminous coal and coke increased nearly 1,300,000 long tons. * * *
>
> "The three causes mentioned have undoubtedly had an adverse effect upon the anthracite interests. Nor is it practicable in the face of existing conditions to so reduce the selling price of anthracite coal that it may successfully meet the competition of bituminous coal, coke and gas. The success of these competitors of anthracite coal may be directly attributed to the unwisdom shown in over-developing the anthracite fields. Enormous outlays of capital in acquiring property and constructing improvements in the boom days of anthracite development are reflected now in 'fixed charges' and other ex-

penses which make it impossible to materially decrease the cost of production. The facts brought out by the unfortunate affair at Hazleton during the summer of 1897 furnish reliable evidence that the miners are not overpaid. The rate per ton paid for mining is low enough now, and as the mines are frequently closed down one-third or one-half the time the employees are necessarily unable to earn more than two-thirds of the wages possible if they were allowed to work full time. As will be seen further on, the miners endeavor to make up for this, in part, by mining more coal per day than they are accustomed to when the mines are running regularly. But such efforts do not offset the losses they suffer through compulsory idleness."

This last paragraph merely shows the vicious circle into which the eagerness for profits had plunged the anthracite industry. In the next paragraph Mr. Parker completes the picture:

"It would seem that with a restricted production and prices well controlled the anthracite interests would be in excellent condition, so far as the operators are concerned; but restricted production and higher prices have reflex actions upon industry which are not always considered. In the first place, when tonnage is reduced the mining cost of every ton of the product won, owing to the regularity and uniformity of the 'fixed charges,' etc., is proportionately increased, while every additional advance in the price produces a diminution in the market demand, and offers an opportunity for the increased consumption of soft coal, coke or gas, as the case may be. Under the prevailing conditions there is reason to believe that the maximum of anthracite production has been, or soon will be, reached. It is certainly safe to predict that the demand will never exceed the present capacity of the anthracite mines."

In other words, the problem of regularity, or irregularity, of employment in the anthracite industry is primarily a question of a balance between the development of the field and the market. And already outside conditions were coming into being which foreshadowed the day when the anthracite industry would have reached a state of equilibrium. If the market had ceased to advance with the workers in the hopeless state prevalent in the last years of the nineteenth century, the anthracite region would indeed have been a blot upon the industrial page of the nation. The situation, created by bad management, was the primary basis for the series of strikes which followed in 1900, 1902 and 1906.

The fact has been pointed out that anthracite was becoming primarily a domestic coal. Already there was beginning to be compe-

tition in this field as well not only from gas as a cooking fuel, but also from the fact that the great office buildings and apartment-houses had begun to grow. In these bituminous steam coal was used for heating in place of anthracite.

A glance at the reports of the Pennsylvania Bureau of Mines shows the same feeling that the development of the anthracite mines had outdistanced the market. The report for 1898 reads as follows:

> "The market for anthracite coal has apparently reached its limit. It is true there is an increase in 1898 of 197,821 tons over 1897; but that is in all probability due to the extraordinarily severe weather that prevailed. It appears from the number of days that the mines were in operation during the year that the mines now opened and number of men employed, are capable of producing very much more coal, which shows that there are more mines opened and more men employed than are necessary to supply the demand." * * *

The feeling among experts at this time seems to have been that, with the limited district in which anthracite is found, the production per day would remain at slightly over 300,000 tons, and that the question of the number of days worked would be determined largely by the number of these 300,000-ton units required by the market. All along there is no doubt but that *market* is the determinant.

IV.

PERIOD OF ORGANIZATION OF THE MARKET FOR DOMESTIC COAL, 1903 TO 1908.

With the beginning of the twentieth century the period of irresponsible competition was over. Both labor and capital in the industry were organizing, which meant regulation in the future. The first important step was taken by the companies when they announced the summer discount policy. This tended to regularize the market—that is, to spread its demands evenly over the full year.

Speaking of this summer discount policy, the Pennsylvania Department of Mines Report for 1904 said:

> "The demand for domestic sizes continued remarkably even throughout the year owing to the operation of the discount plan. By this plan a discount of 50 cents a ton from the schedule price is offered on purchases made in April, with a gradual decrease of 10 cents a month in the discount during May, June, July and August. This method insures a more even distribution of coal throughout the year. The retail dealers and householders have a special inducement to make early purchases, which are stored for winter use, thus maintaining the tonnage during a period generally characterized by inactivity and reduc- in proportionately the danger of congestion in shipping later in the season." * * *

Speaking of the contrast between the periods before and after this step was taken, E. W. Parker, in the 1913 "Mineral Resources of the United States," says:

> "It will be observed that in the anthracite mines during the last decade of the 19th century there was a notably decreasing tendency in the number of days the workers in the anthracite mines were able to work, until in 1897 and 1898 they barely averaged 50 per cent of the possible working days in the year, excluding Sundays and legal holidays. These figures substantiate the claim made about that time that the anthracite miners were unable to earn a total living wage. The consumption of the prepared sizes of anthracite being almost exclusively for domestic purposes, the production was at a 'peak load' during the fall and winter months, with long periods of idleness during the summer. In order to meet the demands of the 'peak loads' it was necessary to keep on the rolls a much larger number of men than if steady employment could be given the year round. * * * Beginning with 1903, however, a marked improvement is shown in the working time made by the anthracite

miners. From 1892 to 1902, inclusive, the anthracite mine workers did not average as much as 200 days in any one year, and the general average for the period was 173 days. Since 1903, on the other hand, the anthracite miners have averaged less than 200 days in only one year, 1906, when there was an extended suspension pending the renewal of the anthracite strike commission's awards, and the general average of the period has been 220 days, 47 days or 27 per cent more than the general average for the earlier period." * * *

The following table gives the data for this period of readjustment:

Year.	Anthracite.				Bituminous.	
	No. men employed.	Av. tonnage per man— day.	year.	Days worked.	Days worked— Penna.	U. S.
1903.....	150,483	2.41	496	206	235	225
1904.....	155,861	2.35	469	200	196	202
1905.....	163,406	2.19	470	215	231	211
1906.....	162,355	2.25	439	195	231	213
1907.....	167,234	2.33	512	220	255	234
1908.....	174,174	2.39	478	200	201	193
Average....	.....	.....	.....	206	225	213

During this period, although the average for such years as 1902, 1906 and 1909 is considerably influenced by the serious stoppages of work which occurred pending the adjustment of disputes between the mine workers and the operators, the general average for the period, 206 days, is primarily an index of market conditions. This is the result of the fact that adjustment every three years had become the regular thing, for which preparation was made in the preceding year. The succeeding year was also, to a large degree, influenced by compensatory production. Thus we notice in the table that the year of stoppage, 1906, is preceded and followed by years during which the number of days operated was relatively high. In this connection we find the following comment upon the year 1903 in the report of the Pennsylvania Department of Mines:

"The long and disastrous strike of 1902 had depleted the supply of coal to such an extent that it required full and continuous work at the mines for the first 10 months of 1903 to restore the normal conditions of the trade in this country and in Canada. During November and December, however, the pro-

> duction was greatly curtailed, owing to a cessation, in the demand, and most of the operations closed down completely on the 24th of the latter month." * * *

So again, in the publication of the United States Geological Survey, "Mineral Resources of the United States," a hint is given to the same effect. Speaking of the high average days worked in 1905, Mr. Parker writes:

> "This average for the anthracite mine workers was the highest recorded in the 16 years that the statistics have been obtained, and was probably due to the efforts put forth by the operating companies to lay in a large supply of coal in anticipation of a strike when the award of the anthracite coal commission expired in the spring of 1906."

As a matter of fact, the extraordinarily low averages of the '90s no longer prevailed. The relation between the market and the supply existing in the '80s had to all intents and purposes been reestablished. Experts considered that the market was about equal to the supply, and, as the increase in number of workers in the industry tended to parallel the slow increase of the market, it would seem as though 206 odd days were considered as constituting a fair year's work in the anthracite fields.

During this period experts remark increasingly on the probability that the anthracite industry has reached its high-water mark. This opinion is based chiefly upon the increasing cost of production, which tends to handicap anthracite in competition with other fuels. In any final judgment as to the probable employment in the industry in the future this factor must be considered. It is remarked that a portion of this increased cost is due to the fact that the workers themselves are producing a smaller quantity per day. But the men giving this opinion are not always careful enough to state that this decrease in the productivity may largely be accounted for by the increasing difficulty of mining as the seams are worked farther and farther, often becoming thinner as the mines go deeper.

Days Worked in Pennsylvania Anthracite Mines Compared with Other Mining Countries.

In the 1906 report of the Pennsylvania Department of Mines there is a small table showing for the period now being considered the comparative time worked in certain coal-producing countries as com-

pared with Pennsylvania anthracite. The table is here reproduced, in order to show to what extent the American anthracite miner is suffering from irregularity of employment more than his fellows in other countries. With the average days worked in the other countries standing at 282, it must be obvious that the mines in those countries have not been subject to the unregulated exploitation from which the miners in the United States have been the chief sufferers.

DAYS WORKED IN VARIOUS COUNTRIES.

Pennsylvania anthracite (1903)	211
Great Britain bituminous (1903)	264
Germany, bituminous (1903)	274
France, bituminous (1900)	296
Belgium, bituminous (1902)	289
Austria, bituminous (1903)	289
Average for foreign countries	282

V.

THE ANTHRACITE INDUSTRY DURING THE PAST DECADE.

From the preceding pages it is evident that the problem of regularity in the anthracite industry is primarily a problem of the ability of the market to absorb the full production of the labor employed. It appears that this market is chiefly responsive to weather conditions and to the growth of population. From the time when the summer discount was introduced the steady growth of population has tended to improve the very bad conditions which resulted from the speculative overinvestment in the industry. But other factors were coming into play which tended more and more to render it doubtful whether the industry would ever reach full-time operation. With these facts in mind, it would appear, from an examination of data for the decade ending with the present time, that the average for the years 1910 to 1916, inclusive, will be found to represent approximately the best average days worked that can be expected from the industry. In other words, it represents a real balance between the demands of the market and the possible production of the limited mining area, which will not be exceeded, and which may tend toward a slow decline, for reasons which will be noted. The average for these years is 242 days of operation, which corresponds almost exactly with the days worked in the Pennsylvania bituminous mines for the same years. The correspondence is even closer than the rough average shows, the exact figures being for the anthracite mines, 241.57, and for the bituminous mines, 241.29. In other words, taking the full number of days worked for the seven years, it will be found that the totals differ by only two days, being 1691 and 1689, respectively. This would certainly seem to indicate relative stabilization of the situation in Pennsylvania at approximately 242 working days, which means a loss to the workers of some 63 possible working days each year, or something over 20 per cent of the year. The exact figures appear in the following table·

Year.	Anthracite.				Bituminous.	
	No. men employed.	Av. tonnage per man day.	Av. tonnage per man year.	Days worked.	Days worked Penna.	Days worked U. S.
1910.....	169,497	2.17	498	229	238	217
1911.....	173,940	2.11	520	246	233	211
1912.....	174,030	2.10	485	231	252	233
1913.....	175,745	2.03	521	257	267	232
1914.....	179,679	2.06	505	245	214	195
1915.....	176,552	2.19	504	230	226	203
1916.....	159,869	2.16	548	253	259	230
Average.....	.....	.....	.....	242	241	219

With the beginning of this period the production of anthracite had reached a level at which it appeared likely to remain. In other words, despite the growth of population, it appeared that other conditions, such as the movement to steam-heated apartment-houses, etc., were likely to prove a counter influence. In "Mineral Resources of the United States" for 1913, it is remarked:

> "The increase in the use of artificial gas and coke for domestic purposes will probably keep pace with the increase of population in the markets supplied by anthracite, and there is little probability that the production of anthracite will show any marked increase in the future. Changes in temperature and labor conditions will continue to be the most important factors affecting the production of anthracite."

Anthracite had almost ceased to respond to ordinary business changes, in which characteristic it differed radically from bituminous coal. And the belief that the maximum regular production of anthracite had been reached seems to be borne out by the fact that the estimated production for 1919 is very slightly in excess of that for 1910, and distinctly less than that for 1911. In short, the production of anthracite may be expected to average under 90,000,000 tons per year. In the year of abnormal demand, 1917, which will be mentioned later, although the production reached nearly 100,000,000 tons, less than 94,000,000 tons of this was actually consumed. Thus, in an attempt to estimate the regularity of employment, the number of days required to produce 86,000,000-odd tons with the labor in the industry should probably be taken as maximum.

Before turning to consider the abnormal years 1917-1918, a few

facts which appear in the above table should be noted. In the first place, it is again to be noticed that the fewer days worked in the year of adjustment, 1912, are compensated by the higher averages for the years preceding and following. In the second place, it appears that the increase in number of days worked during this period as contrasted with the previous period may be in part due to the fact that the mine worker is producing considerably less per day. In fact, the two changes seem to be very closely parallel to each other. And, finally, it may be noticed that the number of workers in the industry, having reached a maximum in 1914, has begun a very decided decline, there being approximately 20,000 less workers in 1916 than in 1914. As a matter of fact, this decline continued until in 1918 there were only approximately 147,000 working in the anthracite mines, a figure below any since 1902.

This last tendency is important from two points of view. In the first place, the increased number of days worked during the last four years corresponds to a shortage of labor from the point of view of the companies. This means that if that shortage of labor is made up, fewer days will again prevail. In the second place, it means that irregular, low-paid work in the anthracite industry proved unattractive when contrasted with the opportunities in the expanding munitions industry of the years mentioned. The decrease in the number of anthracite workers represents a drift to the manufacturing industries.

The Eight-Hour Day and the Regularity of Employment.

In order to forestall the possible contention that the eight-hour day, in effect since 1916, can be held responsible for the increased number of working days in 1917 and 1918, the tables presented in this exhibit include figures as to the tonnage produced per man per day. The contention has already been advanced to the effect that the number of days of work in the years 1910 to 1916 would have been considerably increased had an equivalent eight-hour day been substituted for the nine-hour day actually worked. The actual figures disprove any such assertion. Every competent industrial engineer is cognizant of the fact that a reduction in hours per day may actually tend to increase rather than to decrease the productivity of the worker. The important question in an industry where the number of days worked is determined by the demands of the market

is in reality the number of tons that would be required from each man employed. As the miners are paid on a tonnage basis, this will be the figure which will determine whether they are adequately or inadequately paid.

If the attempt is made to ascertain the number of equivalent eight-hour days which were worked during the years 1910 and 1916, when a nine-hour day was effective, not by multiplying by nine-eighths, but on the basis of tons produced, the unexpected conclusion is reached that on an eight-hour-day basis fewer rather than more days would have been worked. A glance at the tables will show that the mine workers produced more coal per man per day in the eight-hour years 1916 to 1918 than they did in the nine-hour years 1910 to 1915. This information can be segregated in a table, as follows:

PRODUCTION PER MAN PER DAY AND DAYS WORKED, COVERING 9-HOUR AND 8-HOUR YEARS.

Year.	Tons per man per day.	Days worked per year.	Equivalent 8-hr. days on basis of of average production.
1910 (9 hours)	2.17	229	
1911 (9 hours)	2.11	246	
1912 (9 hours)	2.10	231	
1913 (9 hours)	2.03	257	
1914 (9 hours)	2.06	245	
1915 (9 hours)	2.19	230	
Average	2.11	240	226
1916 (8 hours after April)	2.16	253	
1917 (8 hours)	2.27	285	
1918 (8 hours)	2.28	293	
Average	2.24		

Obviously, if during the nine-hour years the worker had produced as much coal per man per day as during the succeeding eight-hour years, they would have worked only 226 days per year instead of 240 to meet the demands of the market. In other words, the industry would have been more irregular than it actually was.

That production may increase when hours are decreased is substantiated by the experience of the short-hour mines of Durham and Northumberland, in England. Mr. Cunningham, Assistant Under Secretary for the Home Department, in his evidence before the

Miners' Eight-Hour-Day Committee in 1907, said, in commenting upon a reduction of 12½ hours per week in the mines above referred to:

"We have every right to presume that the production did go up while the hours went down."

This committee of the British Government, the recommendations of which led to the Eight-Hour Law, summarizes its conclusions from evidence as follows:

> "Nevertheless, after making allowance for this governing fact, and comparing like with like, so far as the evidence enables us to do so, we cannot but conclude that an hour's work of the men employed in East and West Scotland, Northumberland and Durham, where the hours of work are shortest, is more effective than it is in Lancashire and South Wales, where the hours are longest. The tables do not show a uniform proportionate correspondence, but they do show some general relation between short hours and efficient work."

Such facts as these, which are today well known to industrial experts, show the impossibility of reducing the actual day's work to any equivalent basis merely on the basis of number of hours worked. For this reason the 242 days average for the period under consideration stands as a conservative estimate of the irregularity prevalent in the industry under normal market conditions. Had the market for the year 1917 to 1918 been normal and the usual supply of labor been available, such production per man per day as prevailed in those years would have resulted in greater irregularity than that shown as the average for the preceding years.

The Years 1917 to 1918 Not an Index of Regularity.

As already pointed out, the years 1910 to 1919 cannot be averaged together as a homogeneous period to show that the growth of population is actually bringing about regularity in the industry. The following table shows conclusively that the years 1917 to 1918 stand apart as abnormal years. The production figures used in this table were prepared by the mine operators.

CONTRAST BETWEEN NORMAL AND ABNORMAL YEARS IN ANTHRACITE INDUSTRY.

Year.	Production		Days worked.	No. of men employed.
	Prepared and pea (tons).	Steam sizes (tons).		
1912.....	45,678,201	17,932,377	231	174,030
1913.....	50,594,305	18,475,323	257	175,745
1914.....	49,998,507	18,344,094	245	179,679
1915.....	48,944,747	18,939,029	230	176,552
1916.....	48,245,724	19,130,640	253	159,869
Average ..	48,692,297			
1917.....	53,487,277	23,646,028	285	154,174
1918.....	51,974,714	24,675,204	293	147,121
Average ..	52,730,992			
1919.....	48,991,572	17,863,739	(252-273)	152,000

This shows the very interesting fact that the production figures for 1915, 1916 and 1919 are approximately equal. They are approximately equal to the average production for the years 1912-1916. This would seem to indicate that during the last decade the anthracite market has reached a relatively stable position with an average production in domestic sizes of approximately 48,000,000 tons. In contrast with this average, the years 1917, 1918, with the production of domestic sizes 8 per cent higher, and an even greater increase in the production of steam sizes, appear distinctly abnormal.

This abnormal condition of the market has been recognized by practically all authorities engaged in observing the course of the industry. In this connection the following quotations and various Government reports are interesting:

> "There has undoubtably been an immense artificial demand for anthracite this spring. Thousands of householders who normally do not buy until fall have this year poured in their orders in April and May." (P. 31.)
>
> "The greater consumption of large sizes of anthracite by gas and carbon plants and by railroads has caused an increase in demand for these sizes. This is due largely to the fact that coal which formerly came into competition with anthracite coal has been diverted to other uses. Many gas plants which in the past have been making coke as a by-product, some in competition with anthracite, have very materially curtailed their output because of the high price of soft coal. Large manufacturing plants which use coke in connection with their manufactur-

ing processes have turned to anthracite on account of the shortage in coke. * * * Public utilities in some parts of the country have been affected to a considerable extent by the shortage of coke and have substituted anthracite for it. And unprecedented industrial activity created a growing demand for steam sizes by manufacturing plants regularly using anthracite. * * *

"The great expansion of industrial activity in the steel, the cotton textile, and the munition industries accounts for a material increase in the consumption and demand for bituminous coal, which in turn has indirectly placed an added demand on the anthracite supply by industries that could substitute anthracite when bituminous could not be had or when the price of bituminous was higher than that of anthracite." * * *

(Pp. 84-85, report of Fed. Trade Com. on Anthracite and Bit. Coal, June, 1917.)

"The requirements of the country for anthracite for domestic use, for the military uses of the government, for water gas manufacture, and for industrial purposes to replace coke withdrawn for the iron industry, were greater in 1917 than in in any previous year. * * *

"The shortage of bituminous coal in the Eastern States was pronounced throughout the year, and the fine sizes of anthracite were eagerly sought as a substitute for mixture with bituminous coal by industrial plants, especially during the last third of the year." * * * (P. 1014 Mineral Resources of U. S., 1917.)

In connection with the shortage of labor, after remarking on the drift of low paid mine labor to the munitions industries and upon the fact that this did not result in a corresponding decrease in production, the Federal Trade Report makes the following interesting comment:

"From these facts it is clear that great credit is due to the miners and to the mining companies. Apparently the remaining labor force, though working only 8 hours a day instead of 9, was more efficient and the companies managed their operations so as to produce the maximum possible under the difficulties encountered." (P. 35.)

These quotations may be supplemented from the weekly bulletins of the Geological Survey for the year 1919 as follows:

"The total output since the beginning of the coal year is naturally far short of that of last year, when an abnormal demand for anthracite was created by the shortage of bituminous." (Sept. 27, 1919.)

"To compare 1919 with the exceptional years of the war is perhaps deceptive. A more instructive comparison can be had between the first six months of the coal years beginning April 1, 1919, and 1916, etc." * * * (October 11, 1919.)

Labor Shortage and Regularity of Employment in 1917 and 1918.

Perhaps even more significant a cause of the abnormal regularity of employment in the industry during 1917-1918 was the shortage of labor caused by the war. The close correspondence between number of mine workers and number of days worked per year appears clearly in the above table. The average number of men employed in the anthracite industry for the abnormal years 1917-1918 was 150,647. As contrasted with the average for the previous six years, 173,502, this shows a falling off of over 22,000. In other words, during these years of abnormal regularity there were 15 per cent. fewer workers producing 8 per cent. more coal to meet the demand for domestic sizes. This takes no account of the extra men required to produce the additional steam sizes. Clearly it required labor shortage coupled with a highly artificial demand to bring about regularity even approximating a full working year in the anthracite industry.

As a concrete illustration of the way in which the decrease in number of men employed actually increases the regularity of employment we might take the year 1918. In contrast with this year the average of men employed in the years prior to the war was 20 per cent. higher. As already pointed out the question of adequate employment may be considered either in terms of the number of tons which the market requires per worker or in terms of the number of days which the mine operates to meet the demand. Assuming that the average requirements of the market amount to 90,000,000 tons annually of all kinds of anthracite this would mean that each worker would have hypothetical opportunity to produce 600 tons per year when the smaller number of men were employed as contrasted with 523 tons per year with the normal labor force on hand. In terms of number of days worked the conclusion is even more interesting. In order to meet the market requirements in 1918 with approximately 147,000 workers, 293 working days were required; if the number of workers had been 20 per cent. higher as was the case prior to the war it would have required only 252 days to satisfy the market. This represents approximately the best estimate as to the probable number of working days in the industry under normal conditions.

Following the conclusion of the war, conditions in the industry have been steadily returning to normal. As shown in the analysis of the production figures prepared by the operators, the production of coal for 1919 was approximately the average for the years 1910 to 1916, during which the mine workers were unemployed for twenty per cent of the year. The other determining factor, labor shortage, is also being reduced to normal. According to the weekly report of the Geological Survey for August 9, 1919, "it is reported that the supply of labor in the anthracite regions is improving." This is confirmed by the figures submitted by the operators which show that nearly 5,000 men have been added since the lowest point was reached in 1918. The fact of over-investment in the industry is therefore operating again to bring more labor into anthracite mining than the annual market would require if regular conditions of employment were maintained.

In other words, an analysis of the forces which determine conditions of employment in the anthracite industry will lead to the conviction that the forces in operation since the war have been steadily reducing the industry to approximately the condition which prevailed during the years which averaged 242 days of operation. The market required no more prepared and pea coal in 1919 than it averaged for the years 1912-1916. The weekly bulletins issued by the Geological Survey show a steady decline in the requirements of the market following the armistice.

The Year 1919 Not Completely Normal.

Even the year 1919 cannot be considered as a completely normal year. The market would have required less coal from the anthracite mines in 1919 had it not been for the artificial situation created by the bituminous strike. This is clearly shown in the reports of anthracite production compiled week by week at the U. S. Geological Survey. To quote the comments of this weekly report:

> "Anxiety felt by consumers over the impending bituminous strike was reflected in the demand for anthracite, production of which reached a new high level for the year." (Nov. 1, 1919.)
>
> "The anthracite industry responded to the stimulus of active demand caused by the soft coal strike with the largest production of the year." (Nov. 29, 1919.)
>
> "The output of anthracite during the week ended December 6 continued at the high rate maintained since the commencement of the bituminous strike." (Dec. 13, 1919.)

"Responding to the active demand caused by the growing shortage of bituminous coal the output of anthracite during the week ended December 13, rose to the highest level attained this year—indeed, the highest in any week since September, 1918." (Dec. 20, 1919.)

In other words, had it not been for this abnormal demand during the last weeks of 1919, the production of that year would have been lower than the figure shown by several hundred thousand tons.

The year 1919 also shows a continuation of the shortage of labor which existed during the war, although the industry had started to return to its pre-war quota. As this increase in the number of workers continues, it will mean some increase in the production per day with a consequent reduction of the number of days necessary to produce for the market.

Less Complicating Factors in Anthracite Than in Bituminous Mining.

In general it might be remarked that there are less complicating factors in the anthracite branch of the coal industry than in bituminous. Whereas over 50 per cent of bituminous coal is produced by machinery, with the use of machinery increasing, it has not yet been found possible to use machines in anthracite except to a to a very limited extent, approximately 2 per cent of the coal being so produced. This means that the problem of regularity will not be immediately affected by a rapid increase in the productive capacity of the individual worker.

Again, it may be noted that the problem of "car shortage" is not so serious in the anthracite industry as in bituminous. This is explained by the Federal Trade Commission Report as follows:

"In the anthracite industry, where the initial anthracite railroads are identified or affiliated with the larger mining companies, the transportation difficulties are less serious than in the bituminous industry. With minor exceptions the car supply for the production of coal at the anthracite mines seems adequate."

The Commission obtained statistics relating to the railroad car supply at the operations of fifteen anthracite mining companies. Their consolidated tabulation is given below.

ESTIMATED RAILROAD-CAR TONNAGE REQUIREMENTS OF 13 ANTHRACITE MINING COMPANIES, AND ESTIMATED COMMERCIAL TONNAGE LOST THROUGH AN INADEQUATE CAR SUPPLY BY MONTHS, 1915 AND 1916. (GROSS TONS).

Month.	Estimated commercial shipments if fully supplied with cars.		Tonnage shipped.		Estim. produc. of coml. tonnage lost thru an inadequate car supply.	
	1915	1916	1915	1916	1915	1916
January	3,250,582	4,417,709	3,141,210	4,097,664	109,372	320,045
February	2,959,208	4,369,660	2,836,550	3,976,877	122,658	392,783
March	3,486,654	4,894,091	3,338,020	4,394,644	148,634	499,447
April	4,604,499	3,279,103	4,605,631	3,073,936	[1]379	205,167
May	4,136,732	3,950,546	4,051,140	3,776,639	85,592	173,907
June	3,734,623	4,077,789	3,699,578	3,989,027	335,045	88,762
July	3,469,623	3,917,704	3,389,589	3,820,079	80,034	97,625
August	3,661,909	4,084,790	3,626,009	3,965,309	35,900	119,481
September	3,799,054	4,083,075	3,811,188	3,866,956	[1]2,396	216,119
October	4,659,901	4,292,709	4,562,631	4,138,915	97,270	153,794
November	4,557,863	4,402,371	4,467,130	4,299,327	90,733	103,044
December	4,553,814	4,179,373	4,176,305	4,076,594	377,509	102,779
Total 14 Co.'s.	46,874,462	49,948,920	45,704,981	47,475,967	1,185,522	2,472,953
1 Co. 12 mos.	4,642,807	5,137,916	4,562,925	4,413,507	79,882	724,409
Tl. 15 companies	51,517,269	55,086,836	50,267,906	51,889,474	1,265,404	3,197,362

The data in the preceding table represent returns from companies shipping 72.6 per cent of the commercial shipments of anthracite during 1915 and 76.2 per cent of the commercial shipments during 1916. The loss in potential production resulting from inadequate railroad car supply was for the above years, 1,265,404 gross tons and 3,197,362 gross tons, respectively. This meant a loss totaling only 2.517 per cent of their combined commercial shipments in 1915, and 6.161 per cent of these shipments in 1916. Thus it appears that although the figure rose somewhat in 1916, the problem of car shortage is not acute in the anthracite industry.

There is one other factor which has been referred to from time to time which must be mentioned again, i. e. idleness due to strikes. From the previous discussion the impression may have been gained that the degree of idleness due to such strikes was very considerable.

[1]One company reported car tonnage furnished in excess of shipments, 1,511 tons in April, 1915, and 14,530 tons in September, 1915.

A diagram has been prepared recently by the U. S. Geological Survey in order to gain some idea of the extent to which strikes are a factor in non-operation in the coal industry. As shown in the diagram, idleness due to strikes has, during the period 1910-1918, amounted to but a little over one-tenth of the total days of non-operation. And here it should be pointed out again that, except for the strike of 1902, which has been left out in reckoning the general average, the strikes have not materially affected the average because they indirectly caused a compensatory greater number of days worked in the preceding and succeeding years.

VI.

PROBABLE IRREGULARITY IN THE FUTURE.

In estimating the probable number of days which will be worked in the anthracite industry under present circumstances, two broad facts must be considered, (1) the market requirements and (2) the number of men employed. There is of course a third variant, the production per man per day. The fact that this third item enters creates a very interesting situation. Given certain market requirements and a certain number of workers, the setting of a low rate by forcing the men to speed up production for the sake of gaining adequate earnings tends to cause them to produce the supply in fewer days. Thus low rates in the industry will place the workers in a dilemma in which they have a choice between earning more per day with fewer days in which to earn the annual wage, or extending the same annual earning over a greater number of days. This really points to the abnormal condition of the industry.

Briefly summarized, the forces operating to determine the present situation in the industry might be stated as follows:

(1) Competitive over-investment and inflated capitalization have provided the industry with a burden of overhead which it has been forced to carry since the market was organized on a more or less non-competitive basis.

(2) This situation rendered high prices necessary. These were maintained in part by artificial limitation of the supply through the organization of the market on a non-competitive basis.

(3) There resulted a growing encroachment of low-price bituminous coal, fuel oil and gas upon the various branches of the anthracite market. This first limited the growth of the anthracite market to the steady increase in population, and finally tended to cut in even upon the domestic market.

(4) During the last decade these forces have tended to produce a state of equilibrium at what is probably very nearly the maximum steady production which the anthracite industry will attain. In other words, general opinion confirms the belief that the anthracite market reached its normal level during the years just preceding the war and that it is not likely to exceed this level in the near future. With a normal labor force, therefore, it cannot be expected that the anthracite industry will exceed an average of 250 days operation. Variation below this figure will be determined primarily by market

conditions. The probable average of days of operation is more likely to approximate 242 days. In other words, the most optimistic view possible can promise the anthracite mine worker scarcely more than 80 per cent employment. He is faced with the probability of at least 60 working days in which he will be unable, through no fault of his own, to earn a living wage.

In connection with this estimate it should be pointed out that were the abnormal conditions of the war years to continue, the anthracite industry will probably prove unable to maintain steady operation at anything like the rates shown for those years. According to the report of the Pennsylvania Department of Mines for 1903

> "The number of working days * * * can hardly exceed 250 in the year, as the repairs to the mines, inside and outside, require many weeks, and the loss of several weeks more is caused by various accidents, explosions, flooding and cave-ins of mines, and breaking of machinery."

In fact, in forming any estimate it must be recognized that, as in the case of so many other industries, the exigencies of war produced a straining to accomplish the necessary work which tended to neglect the usual repairs and the upkeep of various material parts of the various mine property. Such a pace could not be maintained for a long period.

BEFORE THE UNITED STATES ANTHRACITE COAL COMMISSION

EMPLOYES EXHIBIT NUMBER 9

FREIGHT RATES ON ANTHRACITE COAL 1914-1920

Presented by
W. JETT LAUCK

On behalf of
John L. Lewis, President
Philip Murray, Vice-President
F. P. Hanaway, International Representative
Percy Tetlow, Statistician

John Dempsey
Thomas Kennedy
Chris. J. Golden
} Committee Representing Districts 1, 7 and 9

Of the

United Mine Workers of America

WASHINGTON
1920

BEFORE THE UNITED STATES ANTHRACITE COAL COMMISSION

EMPLOYES EXHIBIT NUMBER_____

FREIGHT RATES ON ANTHRACITE COAL 1914-1920

Presented by

W. JETT LAUCK

On behalf of

United Mine Workers of America

WASHINGTON

1920

FREIGHT RATES ON ANTHRACITE COAL, 1914-1920

The following tables show the rates of freight in effect at the present time and during 1914 on anthracite coal from the producing districts in Pennsylvania to the cities in which retail prices were obtained, except Scranton, Pa., which is in the heart of the anthracite region. Rates are also shown to tidewater points for shipment by water.

These rates are taken from the published tariffs of the principal anthracite carrying railroads on file with the Interstate Commerce Commission. As anthracite shipments to Philadelphia move solely in intra-state traffic, some rates were not on file with the Commission prior to 1917, when the United States Railroad Administration was created.

It will be noted that the rates via different lines are very uniform to New England points and to Baltimore and Washington. Owing to the close proximity of Philadelphia to the anthracite fields, there is a differential on coal shipments between near and distant mines. To some extent this is also true of New York, while the several delivery points in that city likewise carry different rates. It will also be noted that there was a general increase in rates between 1914 and 1920.

ANTHRACITE COAL

PUBLISHED FREIGHT RATES, PER TON OF 2,240 POUNDS, ON PRINCIPAL ANTHRACITE RAILROADS FROM PENNSYLVANIA MINES TO POINTS SPECIFIED, JUNE, 1920, COMPARED WITH 1914

TO BALTIMORE, MD.

Reference Number	Name of Railroad	From Points on Line Named In	Sizes	Rates June, 1920	Rates Year, 1914
1	Pennsylvania Railroad	Northern & Southern Fields	Prepared	$2.60	$2.00
			Pea	2.10	1.60
			Steam	2.10	1.60
12	Central R. R. of N. J.	Lehigh Region	Prepared	2.60	2.00
			Pea	2.40	1.85
			Steam	2.40	1.85
12	Central R. R. of N. J.	Wyoming Region	Prepared	2.60	2.05
			Pea	2.50	1.90
			Steam	2.50	1.90
14	Philadelphia & Reading R. R.	Various Districts	Prepared	2.60	2.00
			Pea	2.10	1.60
			Steam	2.10	1.60
16	Lehigh Valley	Lehigh & Schuylkill Regions	Prepared	2.60	2.00
			Pea	2.40	1.85
			Steam	2.40	1.85
16	Lehigh Valley	Wyoming Region	Prepared	2.60	2.05
			Pea	2.50	1.90
			Steam	2.50	1.90
20	Lehigh & New England R. R.	Southern Field	Prepared	2.60	2.00
			Pea	2.40	1.85
			Steam	2.40	1.85

TO BOSTON, MASS.

Reference Number	Name of Railroad	From Points on Line Named In	Sizes	Rates June, 1920	Rates Year, 1914
2	Pennsylvania Railroad	Northern & Southern Fields	All sizes	$3.20	$2.65
7	Philadelphia & Reading R. R.	Various Districts	All sizes	3.20	2.65
8	Delaware & Hudson	Northern Field	Prepared	3.20	2.75
			Pea	3.10	2.50
			Buckwheat No. 1	3.10	2.30
			Smaller	2.70	1.95
11	Central R. R. of N. J.	Northern & Southern Fields	Prepared	3.20	2.65
			Pea	3.10	2.55
			Buckwheat No. 1	2.90	2.35
			Smaller	2.80	2.20
15	Lehigh Valley	All Fields	All sizes	3.30	2.70
18	Erie Railroad	Northern Field and Points on N. Y. O. & W.	All sizes	3.20	2.65
19	Lehigh & New England R. R.	Southern Field	Prepared	3.20	2.65
			Pea	3.10	2.55
			Buckwheat No. 1	2.90	2.35
			Smaller	2.80	2.25
22	New York, Ontario & Western R. R.	Northern Field	Prepared	3.20	2.65
			Pea	3.10	2.55
			Buckwheat No. 1	2.90	2.35
			Smaller	2.50	1.90

TO BRIDGEPORT

Reference Number	Name of Railroad	From Points on Line Named In	Sizes	Rates June, 1920	Rates Year, 1914
2	Pennsylvania Railroad	Northern & Southern Fields	All sizes	$2.90	$2.30
7	Philadelphia & Reading R. R.	Various Districts	All sizes	2.90	2.30
8	Delaware & Hudson	Northern Field	Prepared	2.90	2.30
			Pea	2.80	2.20 a
			Buckwheat No. 1	2.80	2.20
			Smaller	2.70	2.10
11	Central R. R. of N. J.	Northern & Southern Fields	Prepared	2.90	2.30
			Pea	2.80	2.20
			Buckwheat No. 1	2.60	2.00
			Smaller	2.50	1.90
15	Lehigh Valley	All Fields	All sizes	2.90	2.35
18	Erie Railroad	Northern Field	All sizes	2.90	2.30
19	Lehigh & New England R. R.	Southern Field	Prepared	2.90	2.30
			Pea	2.80	2.20
			Buckwheat No. 1	2.60	2.00
			Smaller	2.50	1.90
22	New York, Ontario & Western R. R.	Northern Field	Prepared	2.90	2.30
			Pea	2.80	2.20
			Buckwheat No. 1	2.60	2.00
			Smaller	2.50	1.90

a. 1916 rates. Rates for 1914 not on file.

TO WASHINGTON

Reference Number	Name of Railroad	From Points on Line Named In	Sizes	Rates June, 1920	Rates Year, 1914
1	Pennsylvania Railroad	Northern & Southern Fields	Prepared	$2.60	$2.00
			Pea	2.40	1.85
			Steam	2.10	1.60
12	Central R. R. of N. J.	Lehigh Region	Prepared	2.60	2.00
			Pea	2.40	1.85
			Steam	2.40	1.85
12	Central R. R. of N. J.	Wyoming Region	Prepared	2.60	2.05
			Pea	2.50	1.90
			Steam	2.50	1.90
14	Philadelphia & Reading R. R.	Various Districts	Prepared	2.60	2.00
			Pea	2.40	1.85
			Steam	2.10	1.60
16	Lehigh Valley	Lehigh & Schuylkill Regions	Prepared	2.60	2.00
			Pea	2.40	1.85
			Steam	2.40	1.85
16	Lehigh Valley	Wyoming Region	Prepared	2.60	2.05
			Pea	2.50	1.90
			Steam	2.50	1.90
20	Lehigh & New England R. R.	Southern Field	Prepared	2.60	2.00
			Pea	2.40	1.85
			Steam	2.40	1.85

TO TIDEWATER

Reference Number	Name of Railroad	From Points on Line Named In	Sizes	Rates June, 1920	Rates Year, 1914	
23	Erie Railroad (To Weehawken, N. J.	Northern Field	Prepared	$1.90	$1.60	
			Pea	1.80	1.45	
			Buckwheat	1.80	1.30	
			Rice and Smaller	1.80	1.15	
24	Philadelphia & Reading R. R. (To Port Reading, N. J.)	Various Districts	Prepared	1.85	1.95	
			Pea	1.75	1.80	
			Buckwheat No. 1	1.75	1.65	a
			Smaller	1.75	1.50	
25	Philadelphia & Reading (To Port Richmond, Pa.)	Various Districts	Prepared	1.80	1.70	
			Pea	1.60	1.40	
			Buckwheat No. 1	1.50	1.25	b
			Smaller	1.40	1.25	
26	Philadelphia & Reading (To Port Liberty, N. J., and Pier 18, Jersey City)	Various Districts	Prepared	2.25	1.95	
			Pea	2.15	1.80	
			Buckwheat No. 1	2.15	1.65	c
			Smaller	2.15	1.50	

a. Subject to reduction of 40c. per ton upon evidence that coal has been dumped over the piers into vessels alongside.
b. Subject to reduction of 40c. per gross ton on prepared, 25c. per ton on pea and buckwheat and 35c. per ton on smaller sizes upon evidence that coal has been dumped over the piers into vessels alongside.
c. Subject to reduction of 35c. per ton upon evidence that coal has been dumped over the piers into vessels alongside.

TO NEW YORK

Reference Number	Name of Railroad	From Points on Line Named In	Sizes	Rates June, 1920	Rates Year, 1914
3	D. L. & W. R. R. (135th St. & Harlem River Delivery)	Northern Field	Prepared	$2.60	$2.00
			Pea	2.40 a	1.85
			Steam	2.10	1.65
5	Philadelphia & Reading R. R. (33rd St. Delivery)	Various Districts	Prepared	2.90	2.30
			Pea	2.80	2.20
			Steam	2.60	2.20
5	Philadelphia & Reading R. R. (130th St. Delivery)	Various Districts	Prepared	2.80	2.25
			Pea	2.70	2.15
			Steam	2.50	2.15
9	Delaware & Hudson Co. (33rd, 60th & 130th Sts. Delivery)	Northern Field (Group A)	Prepared	2.60	2.50
			Pea	2.40	2.35
			Buckwheat No. 1	2.10	2.20
			Smaller	2.00	2.05
9	Delaware & Hudson Co. (33rd, 60th & 130th Sts. Delivery)	Northern Field (Group B)	Prepared	2.70	2.50
			Pea	2.50	2.35
			Buckwheat No. 1	2.20	2.20
			Smaller	2.00	2.05
10	Central R. R. of N. J. (133rd St. Delivery)	Northern & Middle Fields	Prepared	2.60	2.00
			Pea	2.40	1.85
			Buckwheat No. 1	2.10	1.65
			Smaller	2.00	1.55
17	Lehigh Valley (38th St. Delivery)	Lehigh & Schuylkill Regions	Prepared	2.30	1.80
			Pea	2.10	1.60
			Steam	1.90	1.40
17	Lehigh Valley (38th St. Delivery)	Wyoming Region	Prepared	2.30	1.80
			Pea	2.10	1.65
			Steam	1.90	1.45

a. To be advanced 15c. June 29, 1920.

TO PHILADELPHIA

Reference Number	Name of Railroad	From Points on Line Named In	Sizes	Rates June, 1920	Rates Year, 1914
4	Pennsylvania Railroad	Northern & Southern Fields in Group 1	Prepared	$2.30	$1.80
			Pea	2.00	1.50
			Steam	1.80	1.35
4	Pennsylvania Railroad	Northern & Southern Fields in Group 2	Prepared	2.00	1.75
			Pea	2.00	1.45
			Steam	1.80	1.30
4	Pennsylvania Railroad	Northern & Southern Fields in Group 3	Prepared	2.00	1.70
			Pea	1.80	1.40
			Steam	1.70	1.25
4	Pennsylvania Railroad	Northern & Southern Fields in Groups 4, 5 and 6	Prepared	1.90	1.70
			Pea	1.70	1.40
			Steam	1.70	1.25
6	Philadelphia & Reading R. R.	Southern & Middle Fields	Prepared	1.90	1.45
			Pea	1.70	1.25 a
			Steam	1.70	1.20
13	Central R. R. of N. J.	Lehigh Region	Prepared	2.10	1.61
			Pea	1.90	1.41 a
			Steam	1.80	1.36
13	Central R. R. of N. J.	Wyoming Region	Prepared	2.40	1.85
			Pea	2.10	1.58 a
			Steam	2.00	1.49
16	Lehigh Valley	Lehigh & Schuylkill Regions	Prepared	2.00	1.75
			Pea	1.80	1.45
			Steam	1.70	1.30
16	Lehigh Valley	Wyoming Region	Prepared	2.00	1.80
			Pea	1.80	1.50
			Steam	1.80	1.35
21	Lehigh & New England R. R. (Via Del. & Raritan Canal)	Southern Field	Prepared	2.20	1.75
			Pea	1.90	1.45
			Steam	1.80	1.30

a. 1917 Rates. Rates prior to 1917 not on file with I. C. C., this being intra-state traffic.

TO PROVIDENCE, R. I.

Reference Number	Name of Railroad	From Points on Line Named In	Sizes	Rates June, 1920	Rates Year, 1914
2	Pennsylvania Railroad	Northern & Southern Fields	All sizes	$3.30	$2.70
7	Philadelphia & Reading R. R.	Various Districts	All sizes	3.30	2.70
8	Delaware & Hudson	Northern Field	Prepared	3.30	2.70
			Pea	3.20	2.60
			Buckwheat No. 1	3.20	2.60
			Smaller	2.90	2.30
11	Central R. R. of N. J.	Northern & Southern Fields	Prepared	3.30	2.70
			Pea	3.20	2.60
			Buckwheat No. 1	3.00	2.40
			Smaller	2.90	2.10
15	Lehigh Valley	All Fields	All sizes	3.30	2.75
18	Erie Railroad	Northern Field	All sizes	3.30	2.70
19	Lehigh & New England R. R.	Southern Field	Prepared	3.30	2.70
			Pea	3.20	2.60
			Buckwheat No. 1	3.00	2.40
			Smaller	2.90	2.10
22	New York, Ontario & Western R. R.	Northern Field	Prepared	3.30	2.70
			Pea	3.20	2.60
			Buckwheat No. 1	3.00	2.40
			Smaller	2.90	2.10

a. 1916 rates. Rates for 1914 not on file.

REFERENCE NOTES

1. Pennsylvania R. R. Tariffs, I. C. C. Nos. AA-1133 (1920), AA-318 (1914).
2. Pennsylvania R. R. Tariffs, I. C. C. Nos. AA-1358 (1920), AA-312 (1914).
3. Delaware, L. & W. Tariffs, I. C. C. Nos. 15334 (1920), 8088 (1914).
4. Pennsylvania R. R. Tariffs, I. C. C. Nos. AA-1127 (1920), AA-337 (1914).
5. Philadelphia & Reading Tariffs, I. C. C. Nos. A-888 (1920), A-366 (1914).
6. Philadelphia & Reading Tariffs, I. C. C. Nos. A-800 (1920), A-689 (1917).
7. Philadelphia & Reading Tariffs, I. C. C. Nos. A-763 (1920), A-493 (1914).
8. Delaware & Hudson Tariffs, I. C. C. Nos. 12851 (1920), 11013 (1914).
9. Delaware & Hudson Tariffs, I. C. C. Nos. 12851 (1920), 1105 (1914).
10. Central R. R. of N. J. Tariffs, I. C. C. Nos. A-581 (1920), A-211 (1914).
11. Central R. R. of N. J. Tariffs, I. C. C. Nos. A-376 (1920), A-249 (1914).
12. Central R. R. of N. J. Tariffs, I. C. C. Nos. A-583 (1920), A-137 (1914).
13. Central R. R. of N. J. Tariffs, I. C. C. Nos. A-490 (1920), A-474 (1914).
14. Philadelphia & Reading Tariffs, I. C. C. Nos. A-759 (1920), A-408 (1914).
15. Lehigh Valley R. R. Tariffs, I. C. C. Nos. D-1098 (1920), D-605 (1914).
16. Lehigh Valley R. R. Tariffs, I. C. C. Nos. D-980 (1920), D-682 (1914).
17. Lehigh Valley R. R. Tariffs, I. C. C. Nos. D-1217 (1920), D-653 (1914).
18. Erie R. R. Tariffs, I. C. C. Nos. D-860 (1920), D-634 (1914).
19. Lehigh & New England R. R. Tariffs, I. C. C. Nos. A-4832 (1920), A-3636 (1916).
20. Lehigh & New England R. R. Tariffs, I. C. C. Nos. A-4892 (1920), A-2442 (1914).
21. Lehigh & New England R. R. Tariffs, I. C. C. Nos. A-4785 (1920), A-2481 (1914).
22. New York, Ontario & W. R. R. Tariffs, I. C. C. Nos. 7855 (1920), 5149 (1914).
23. Erie R. R. Tariffs, I. C. C. Nos. D-890 (1920), D-662 (1914).
24. Philadelphia & Reading Tariffs, I. C. C. Nos. A-721 (1920), A-504 (1914).
25. Philadelphia & Reading Tariffs, I. C. C. Nos. A-728 (1920), A-502 (1914).
26. Philadelphia & Reading Tariffs, I. C. C. Nos. A-833 (1920), A-445 (1914).

BEFORE THE UNITED STATES ANTHRACITE COAL COMMISSION

EMPLOYES EXHIBIT NUMBER 10

OCCUPATION HAZARD OF ANTHRACITE MINERS

Presented by

W. JETT LAUCK

On behalf of

John L. Lewis, President
Philip Murray, Vice-President
F. P. Hanaway, International Representative
Percy Tetlow, Statistician

John Dempsey
Thomas Kennedy
Chris. J. Golden
} Committee Representing Districts 1, 7 and 9

Of the

United Mine Workers of America

WASHINGTON
1920

This exhibit was prepared under the
supervision of
W. JETT LAUCK
by Henry J. Harris

BEFORE THE UNITED STATES ANTHRACITE COAL COMMISSION

EMPLOYES EXHIBIT NUMBER_____

OCCUPATION HAZARD OF ANTHRACITE MINERS

Presented by

W. JETT LAUCK

On behalf of

United Mine Workers of America

WASHINGTON

1920

3A

TABLE OF CONTENTS

OCCUPATION HAZARD OF ANTHRACITE MINERS

SUMMARY OF CONCLUSIONS.

1. A prominent authority states, "Probably no industry is so subject to exceptional hazards as the coal industry."
2. The general mortality of the anthracite miner is distinctly above the average for all occupied males.
3. A large and representative life insurance company will accept coal miners only if they pay rates for 16 years above the actual age, and even then will permit them to have no cheaper form of policy than a 20-year endowment; only one other occupation is subjected to more drastic conditions.
4. The Director of the United States Bureau of Mines stated: "The hazard of (coal) mining is undeniably on the increase."
5. The latest anthracite report of the Pennsylvania Department of Mines states that, in spite of increased inspections, there has been no decrease in the fatalities in or about the mines.
6. A Bulletin of the United States Bureau of Labor Statistics states: "Throughout every year of the working period of life the mortality of coal miners includes a relatively much higher proportion of deaths from accidents than is found to prevail among all occupied males."

   The State Insurance Department of Pennsylvania found that anthracite mining had the highest accident severity rating of all industries under the compensation act, with but one exception, viz., iron construction.
7. The personal accident insurance companies impose strict limitations on the occupation of coal miner, and will grant only a minimum amount of insurance; printers and machinists are given five and six times more insurance protection than the coal miner.
8. The leading causes of death are respiratory diseases and industrial accident.
9. The non-fatal accidents in the Pennsylvania anthracite field in 1916 disabled about one-sixth of the entire working force for a greater or less period.

   The Report of the Pennsylvania State Health Insurance Commission states that "the total sickness rate among

miners was 8 per cent higher than the general rate for white adult males."

10. Where the injury did not cause death, it most frequently caused disability in the arms and legs, with resulting inability to resume mine work on recovery.
11. The Report of the Pennsylvania State Commission on Old Age Pensions states, "Miners age prematurely."

General Character of Hazards.

Anthracite mining is quite generally recognized as a hazardous occupation, but the full extent of this hazard is not generally appreciated. In the following statement a summary is given of authoritative information on this subject. The sources of these data are the findings of the United States Bureau of Labor Statistics, the United States Bureau of Mines, the Pennsylvania State Department of Mines, State commissions, the experience of leading life and accident insurance companies, etc.

The importance of combating this great occupational hazard is so clearly recognized that the Federal Government has created a special national office—the United States Bureau of Mines—to aid the industry in this movement of reducing the danger to life and limb. No other industry has received this rather doubtful honor, with the exception of railroading, which is peculiarly an interstate industry.

Not only is the hazard of mining exceptional, but there is no indication that it is diminishing—in fact, the Director of the United States Bureau of Mines states: "The hazard of (coal) mining is undeniably on the increase." The Pennsylvania Department of Mines states that, in spite of a great increase in the number of inspectors, there has been no reduction in the number of fatalities to anthracite miners.

In the analysis of this exceptionally great occupation hazard, the facts may be summarized under the following headings:

1. The duration of life of the miner.
2. The accident hazard:
    a. Fatal accidents.
    b. Non-fatal accidents.
3. The occupational diseases of miners.
4. Premature invalidity.

I. THE DURATION OF LIFE OF THE ANTHRACITE MINER.

The mortality experience of American life insurance companies has been compiled in the Medico-actuarial investigations of these companies. The general result of these studies is, to use the words of Dr. Hoffman, "The mortality of coal miners in the United States is distinctly above the average." It must be remembered, however, that miners who are accepted for life insurance are subjected to extreme care in medical examination. The following statement in Bulletin 231 of the United States Bureau of Labor Statistics summarizes a lengthy study of the mortality of miners:

> "The only additional statistical information available regarding the mortality of coal miners in the United States is the combined collective experience of American life insurance companies, issued by the Medico-actuarial committee. The experience, fortunately, is divided into anthracite and bituminous, but not with reference to the causes of death. The data are set forth in detail in Table 161, which indicates the ratio of the actual to the expected mortality, showing for the anthracite coal miners a ratio of 191 deaths actually experienced against 132 for the bituminous miners. How far the factor of occupational selection is of importance has not been determined. In all probability the average duration of insurance in bituminous coal fields is less than in the older anthracite fields. The experience for both classes is entirely too limited for a safe conclusion in that there are only 66 deaths of anthracite coal miners and 45 deaths of bituminous coal miners. The small number exposed to risk at the older ages is suggestive of extreme care in medical selection. The table, particularly for the younger ages, indicates that the general mortality of coal miners in the United States is distinctly above the average."

MORTALITY FROM ALL CAUSES AMONG COAL MINERS OF UNITED STATES (MEDICO-ACTUARIAL EXPERIENCE) BY AGE GROUPS.

Age at Death.	Number exposed to risk.	Actual deaths.	Expected deaths.	Ratio of actual to expected deaths.
Anthracite Coal Miners:				
15 to 29 years	1,412	11	6.71	164
30 to 39 years	1,460	15	8.89	169
40 to 49 years	949	22	9.76	225
50 to 59 years	405	17	8.89	191
60 years and over	9	1	.30	333
Total	4,235	66	34.55	191
Bituminous Coal Miners:				
15 to 29 years	2,883	22	12.60	175
30 to 39 years	2,684	18	13.75	131
40 to 49 years	738	4	6.00	67
50 to 59 years	106	1	1.79	56
60 years and over	3	..	.08	...
Total	6,414	45	34.22	132

In the introduction to this study it is stated "generally the excess of the mortality ratio over 100 per cent indicates the extent of the extra mortality due to the particular occupation in question" (Vol. III, p. 6). It is thus fair to state, on the basis of the small number of miners accepted by conservative insurance companies, that the anthracite miner has a death rate at least 91 per cent higher than the average; in other words, almost two anthracite miners die for every one person in a healthy occupation, such as farm worker.

The causes of the high death rate of coal miners are analyzed in Bulletin 207 of the United States Bureau of Labor Statistics, which gives in condensed form a study of the mortality experience of the Metropolitan Life Insurance Company (Industrial Department). The Bulletin states (page 28 and following):

> "There were 1,557 deaths among coal miners.[1] The table following indicates the distribution of these deaths by age periods, and the corresponding distribution in all occupations":

[1] This title includes foremen and workmen in coal mines: Line drivers, pit miners (in coal mines only), cagers, cribmen, drillers, laborers in coal mines, trimmers, shaft tenders and timbermen in coal mines.

NUMBER AND PER CENT OF DEATHS FROM ALL CAUSES, AMONG COAL MINERS, BY AGE PERIODS, IN COMPARISON WITH ALL OCCUPATIONS—WHITE MALES.

Item.	Ages 15 years and over.	Age periods (years).					
		15-24	25-34	35-44	45-54	55-64	65 and over.
Coal Miners: Deaths	1,557	151	135	182	319	407	363
Per cent of deaths	100.0	9.7	8.7	11.7	20.5	26.1	23.3
All Occupations: Per cent of deaths	100.0	11.8	13.7	16.2	17.7	20.3	20.3

"A considerably larger proportion of the deaths in this occupation occurred after the age of 44—69.9 per cent, as against 58.3 per cent in all occupations. The average age at death is 51.3 years.

"The following table analyzes the mortality of each age class, by cause of death":

NUMBER OF PER CENT OF DEATHS FROM SPECIFIED CAUSES AMONG COAL MINERS, BY AGE PERIODS, 15 YEARS AND OVER—WHITE MALES.

(Metropolitan Life Insurance Co., Industrial Department—Mortality Experience, 1911 to 1913).

Causes of death	Ages 15 yrs. and over		Per cent of deaths during age period (years)						Average age at death
	Number	Per cent	15-24	25-34	35-44	45-54	55-64	65 and over	
Number of deaths	1,557	.....	151	135	182	319	407	363	....
Influenza	23	1.5	0.7	.....	1.6	0.6	2.2	2.2	58.9
Tuberculosis of the lungs	91	5.8	4.0	11.9	12.1	6.6	3.4	3.3	45.8
Cancer (all forms)	71	4.6	.7	1.5	2.7	3.4	6.9	6.6	58.9
Cerebral hemorrhage, apoplexy, and paralysis	94	6.0	.7	.7	1.6	4.1	7.6	12.4	62.3
Organic diseases of the heart	149	9.6	2.6	4.4	6.6	8.8	10.8	15.2	57.9
Acute and chronic bronchitis	49	3.1	.....	.....	1.1	1.6	4.2	6.9	63.6
Pneumonia (lobar and undefined)	161	10.3	4.6	7.4	10.4	14.7	11.3	8.8	53.1
Cirrhosis of the liver	37	2.4	.....	.7	1.1	4.1	2.9	2.5	56.4
Bright's disease	116	7.5	.....	1.5	6.6	7.8	11.5	8.3	58.3
Suicide (all forms)	18	1.2	.7	2.2	2.2	2.2	.7	.....	44.6
Accidental violence	317	20.4	62.9	43.7	30.7	15.7	10.3	4.1	36.6
All other causes	431	27.7	23.2	25.9	22.9	30.4	28.0	29.9	....
Total	1,557	100.0	100.0	100.0	100.0	100.0	100.0	100.0	51.3

"In the age period 15 to 24, tuberculosis of the lungs is of small consequence, causing only 4 per cent of all deaths, as compared with 33.8 per cent in the general group. Its relative index is 11.8[1]. Organic diseases of the heart are low (44.8), as is also suicide (25.0). On the other hand, accidental violence shows a relative index of 327.6. In the age period 25 to 34, practically the same general conditions are observed. Tuberculosis of the lungs is very low (29.1), and accidental violence remains high (349.6). In the age period 35 to 44, the relative index for tuberculosis of the lungs is 36.8. Influenza and the respiratory diseases exhibit a high proportionate mortality. The relative index for influenza is 266.7, that for bronchitis 366.7, and that for pneumonia 128.4. Suicide exhibits a relative index of 75.9, and accidental violence remains high, with an index of 310.1. In the age period 45 to 54 no new variations are noted. Tuberculosis of the lungs is 35.7; bronchitis and pneumonia remain high, the relative indices being, respectively, 266.7 and 179.3. Accidental violence, though lower than in the previous age periods, is still high (184.7). In the age period 55 to 64 the relative index for tuberculosis of the lungs is low (39.5); for bronchitis (381.8) and for pneumonia (150.7) it is high. Accidental violence still remains high, with a relative index of 158.5. In the age period 65 and over the relative indices for bronchitis (363.2) and pneumonia (139.7) are high."

Life insurance companies use a system of rating hazardous occupations based upon the companies' past experience in granting insurance to persons following these occupations. Their method of protecting themselves is either to refuse applications or to accept such applications with stringent restrictions. Persons engaged in mining (underground) are accepted for insurance, but with the handicap, first, of having 16 years added to their actual age, and, second, of being permitted to purchase no cheaper form of policy than a 20-year endowment, the rates of which are more than double the rate for ordinary life policies. From the following list, used by a typical company, the New York Life Insurance Co., it will be seen that only one occupation, "freight brakemen on trains without safety appliances," is charged a higher rate. It may be said, therefore, that an underground miner is engaged in such a hazardous occupation that he is barely within the class which is permitted to purchase life insurance.

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[1] Relative index means that all occupied males in the age class are considered as equalling 100.

The following table includes all occupations which are subjected to an advance of 9 or more years in age because of the occupation hazard involved:

HAZARD RATINGS OF NEW YORK LIFE INSURANCE COMPANY.

(Source: New York Life Insurance Co. Treatment of applicants engaged in occupations which involve some additional hazard. Form 1519, New York City, 1912.)

	Years.
Railroad freight brakemen—on trains without automatic couplers—signal men, not from towers, yard switchmen (limited to 10, 15 and 20-year endowments)	20
Working miners (limited to 10, 15 and 20-year endowments)	16
Oilwell shooters (limited to 10, 15 and 20-year endowments)	15
Railroad freight brakemen—on trains equipped with automatic couplers—car cleaners, coal heavers, flagmen at crossings, Pullman car porters, section hands, wrecking crews, yard signal repairers and switch repairers (limited to 10, 15 and 20-year endowments)	15
Stock yards butchers, shavers and skinners (limited to 10, 15 and 20-year endowments)	15
Soldiers, gunners and ordnance men (limited to 10, 15 and 20-year endowments for an amount not exceeding $2,000)	12
Cartridge workers who break up condemned cartridges (limited to 10, 15 and 20-year endowments)	12
Firemen and sailors on ocean and Great Lakes (limited to 10, 15 and 20-year endowments)	12
Navy ordnance men, sailors and gunners (limited to 10, 15 and 20-year endowments for an amount not exceeding $2,000)	12
Railroad engine firemen, engine hostlers, wipers and flue cleaners, freight conductors, conductors of mixed passenger and freight trains (limited to 10, 15 and 20-year endowments)	12
Cement mill employees (limited to 10, 15 and 20-year endowments)	10
Officers on sailing vessels and master mariners on fishing vessels	10
Metal polishers (limited to 10, 15 and 20-year endowments)	10
Potters—wheel or mold (limited to 10, 15 and 20-year endowments)	10
Powder mill foremen and skilled employees in factories; those who work in the outside gang, in the acidhouses, or in the warehouses (limited to 10, 15 and 20-year endowments)	10
Sawmill filers	10
Smelter workers, laborers (limited to 10, 15 and 20-year endowments)	10
Mine owners, superintendents, mining engineers, foremen, bosses and overseers, whose regular duties take them underground	9

While it may not be strictly accurate to say that the life insurance companies regard the miner's life as 16 years shorter than the life of a person in a safe occupation, yet this is what the above rating practically amounts to.

II. THE ACCIDENT HAZARD OF COAL MINERS.

(a) *Fatal Accidents.*

The data for hard coal and for soft coal mining are not always given separately. An analysis of the causes of death of coal miners—hard and soft coal—insured in the Prudential Insurance Company (Industrial Department) is given in Bulletin 157 of the United States Bureau of Labor Statistics. A special form of statistical table is used to compare the deaths from accidents with deaths from all other causes. This table is reproduced below. Commenting upon it, the Bulletin states (p. 114):

> "As an illustration of the method adopted, a brief reference may be made to coal miners; there were 2,719 deaths during the period 1907 to 1912, of which 631 were due to accidents, or 23.2 per cent of the mortality from all causes. The corresponding average proportion for all occupied males was 9.4 per cent. The excess becomes much more marked when the percentages are compared for the separate divisional periods of life: At ages 15 to 24, out of every 100 deaths from all causes of coal miners, 56.9 were deaths caused by accidents, against 20.7 for all occupied males; at ages 25 to 34 the respective figures were 42.3 and 12.8; at ages 35 to 44 they were 34.3 and 10.2; at ages 45 to 54 they were 20.4 and 8.9. The excess in the mortality figures for coal miners continues throughout life, for at ages 55 to 64 the accident percentage for coal miners was 12.9, against 6.4 for all occupations; whereas at ages 65 and over the respective percentages were 5.1 and 4.1. The analysis, therefore, proves conclusively that throughout every year of the working period of life the mortality of coal miners includes a relatively much higher proportion of deaths from accidents than is found to prevail among all occupied males. The facts are, therefore, quite conclusive of the need of a nation-wide effort to bring about a material reduction of the accident frequency in mines."

PROPORTIONATE MORTALITY OF COAL MINERS, MALES, FROM ACCIDENTS BY OCCUPATIONS AND AGE GROUPS, 1907 TO 1912.
(Prudential Isurance Co.)

Age groups.	Deaths from—		Per cent of deaths due to accidents.	
	All causes.	Accidents.	In specified occupation.	Among occupied males.
Coal Mines—Drivers:				
15 to 24 years	21	18	85.7	20.7
24 to 34 years	5	4	80.0	12.8
35 to 44 years	2	1	50.0	10.2
45 to 54 years	..	..	....	8.9
55 to 64 years	..	..	....	6.4
65 years and over	..	..	....	4.1
Total	28	23	82.1	9.4
Coal Mines—Laborers:				
15 to 24 years	11	7	63.6	20.7
25 to 34 years	12	6	50.0	12.8
35 to 44 years	6	..	....	10.2
45 to 54 years	10	1	10.0	8.9
55 to 64 years	9	1	11.1	6.4
65 years and over	4	1	25.0	4.1
Total	52	16	30.8	9.4

Age groups.	Deaths from—		Per cent of deaths due to accidents.	
	All causes.	Accidents.	In specified occupation.	Among occupied males.
Coal Mines—Foremen:				
15 to 24 years	..	..	....	20.7
25 to 34 years	4	2	50.0	12.8
35 to 44 years	10	5	50.0	10.2
45 to 54 years	22	4	18.2	8.9
55 to 64 years	14	1	7.1	6.4
65 years and over	6	2	33.3	4.1
Total	56	14	25.0	9.4
Coal Miners:				
15 to 24 years	267	152	56.9	20.7
25 to 34 years	281	119	42.3	12.8
35 to 44 years	341	117	34.3	10.2
45 to 54 years	623	127	20.4	8.9
55 to 64 years	699	90	12.9	6.4
65 years and over	508	26	5.1	4.1
Total	2,719	631	23.2	9.4

The experience of the Metropolitan Life Insurance Company (Industrial Department) likewise shows an excessively high proportion of deaths from accidents to coal miners (anthracite and bituminous). Bulletin 207 of the United States Bureau of Labor Statistics gives a statement of this experience for the years 1911 to 1913 (see table above on p. 8). By using the figure for all occupied males as 100, a "relative index" is obtained. This shows, for instance, that for all ages up to 44 the deaths from accidents were over 300—that is over three times the average. The study in Bulletin 207 states:

> "The high rate from accidental violence is characteristic of all age periods, but especially up to age 45. For all ages the relative index of accidental violence is 219.4. Between the ages of 15 and 44 the relative indices are all over 300. The age period 45 to 54 has a relative index of 184.7; in the age period 55 to 64 the index is 158.5. In the last period, 65 and over, it is only 93.2. The Prudential experience is very nearly the same as that of the Metropolitan; for all ages the relative index is 246.2. The index for the material of the British Registrar General's office is 256.9. The above figures show clearly the effect of the dangers of the occupation upon the mortality of coal miners."

Another impartial estimate of the accident hazard of anthracite mining is found in the rating of the occupation by the accident insurance companies. These companies have a joint bureau which has made elaborate studies of occupation hazards and has published the results of these investigations in a volume entitled "Classification of Occupations for Accident and Health Insurance. As Approved by the Standard Manual Committee of the Bureau of Personal Accident and Health Underwriters. Revised and Corrected to March 1, 1919." New York, 1919. (The coal mine ratings cited herewith are found on pages 14, 60 and 61 of this publication.)

According to the experience of these companies, they are willing to provide a coal mine owner who does not enter or visit his mine $10,000 of personal accident insurance, but if he does enter or visit his mine, then this amount must be cut in two, and he can secure only $5,000 protection. According to the manual, therefore, merely entering or visiting a coal mine cuts a man's desirability as an accident insurance risk directly in half.

If, however, a man is a coal miner, then he is at once excluded from the usual classes of risk, and is placed in a special class, designated as the "C Miner" group, and under no circumstances may he have

more than $500 protection; furthermore, if he is a miner's laborer, he may not have more than $250 protection.

In the opinion of these specialists on occupation hazards, $500 is all that it is safe to risk on a trained coal miner and $250 on his helper. A carpenter, using machinery, may have $2,000, a machinist may have $2,500, a printer (pressman) may have $3,000, and other skilled occupations may have corresponding amounts of protection, but the trained coal miner may have only a minimum of protection—his occupation hazard being too great to permit of anything more.

The record of fatal accidents in the Pennsylvania anthracite mines from 1899 to 1916, inclusive, is given in the Pennsylvania Anthracite Report for 1916 (the latest available). This record is as follows:

FATAL ACCIDENTS IN PENNSYLVANIA ANTHRACITE MINES, 1899-1916.

(Source: Pennsylvania, Department of Mines Report, 1916, Part 1, Anthracite, Page 104.)

Year.	Production.	Employes.	Fatal accidents.	Lives lost per 1,000 employes.	Lives lost per 1,000,000 tons produced.	Production per life lost.
1899.....	60,518,331	140,604	461	3.28	7.62	131,276
1900.....	57,363,396	143,824	411	2.86	7.16	139.570
1901.....	67,094,665	147,651	513	3.47	7.65	130,789
1902.....	41,340,935	148,139	300	2.03	7.26	137,803
	178,409,849	262,688	832	3.17	4.67	214,435
1904.....	73,594,369	161,330	595	2.69	8.08	123,688
1905.....	78,647,020	168,254	644	3.83	8.19	122,123
1906.....	72,139,510	166,175	557	3.35	7.72	129,514
1907.....	86,056,412	168,774	708	4.20	8.23	121,549
1908.....	83,543,243	174,503	678	3.88	8.12	123,220
1909.....	80,223,833	171,195	567	3.31	7.07	141,488
1910.....	83,683,994	168,175	601	3.57	7.18	139,241
1911.....	90,917,176	173,338	699	4.03	7.69	130,067
1912.....	84,426,869	175,098	601	3.43	7.12	140,477
1913.....	91,626,964	175,310	624	3.56	6.81	146,838
1914.....	91,189,641	180,899	600	3.32	6.58	151,982
1915.....	89,377,706	177,339	588	3.32	6.58	152,003
1916.....	87,680,198	159,169	565	3.55	6.44	155,186
Totals and averages..	1,394,656,847	2,951,604	10,230	3.47	7.34	136,330

As stated elsewhere, a constant effort has been made by the industry and by the State government to provide inspectors, safety devices, etc., in order to reduce the number of fatalities in anthracite mines, though so far but little success has attended these efforts.

The true index of the fatal accident rate is the rate per 1,000 employees. For the period 1899-1916, the average deaths were 3.47 per 1,000 employees; in 1916 it was 3.55, and in the past ten years five of the years have rates in excess of 3.55, while the lowest rate in the last ten years was 3.32 per 1,000 employees. It is fair to state, therefore, that no appreciable reduction has occurred in the anthracite mining hazard since 1900. This general statement is emphasized if the fatal accident rate is given by decades. Stated in summary form, the deaths per 1,000 employees by decades, 1870-1916, were as follows (Report, 1916, Pennsylvania Department of Mines, Part I, Anthracite, p. 153):

Period.	Deaths per 1,000 employes.
1870–1879	4.02
1880–1889	3.10
1890–1899	3.15
1900–1909	3.42
1910–1916	3.54
1916	3.55

The causes of fatal accidents in anthracite mines are shown in the following table for the period 1870 to 1916:

CAUSES OF FATAL ACCIDENTS TO PENNSYLVANIA ANTRACITE MINERS, 1870-1916.
(Source: Pennsylvania, Department of Mines Report, 1916, Part I, Anthracite, Page 147).

Cause of fatal accidents.	1870-1879	Per-centages	1880-1889	Per-centages	1890-1899	Per-centages	1900-1909	Per-centages	1910-1916	Per-centages	Grand totals	Per-centages 47 years
Inside.												
Falls of coal, slate and roof	927	46.44	1,351	50.37	1,928	51.87	2,291	49.16	1,730	46.30	8,227	48.99
Mine cars	263	13.18	470	17.52	535	14.39	710	15.23	572	15.31	2,550	15.19
Explosions of gas	243	12.17	250	9.32	399	10.74	352	7.55	256	6.85	1,500	8.93
Suffocation by gas, etc	53	2.66	10	.37	114	3.07	103	2.21	159	4.25	439	2.61
Explosions of powder and dynamite	76	3.81	82	3.06	117	3.15	206	4.42	113	3.02	594	3.54
Blasts, premature and otherwise	124	6.21	182	6.79	280	7.53	435	9.34	451	12.07	1,472	8.77
Falling into shafts, slopes, etc	100	5.01	117	4.36	178	4.79	241	5.17	159	4.25	795	4.73
Crushed at batteries	12	.60	5	.19	12	.32	17	.37	26	.70	72	.43
Mules	16	.80	8	.30	44	1.18	37	.79	16	.43	121	.72
Electricity	.....	.....	.....	.....	.....	.....	10	.22	27	.72	37	.22
Miscellaneous causes	182	9.12	207	7.72	110	2.96	258	5.54	228	6.10	985	5.87
Totals and percentages	1,996	100.00	2,682	100.00	3,717	100.00	4,660	100.00	3,737	100.00	16,792	100.00
Outside.												
Cars	76	30.16	167	39.11	199	31.74	316	38.03	234	43.25	992	37.04
Machinery	66	26.19	110	25.76	127	20.26	212	25.51	117	21.63	632	23.60
Suffocation in chutes, etc	14	5.56	3	.70	33	5.26	54	6.50	31	5.73	135	5.04
Boiler explosions	21	8.33	29	6.79	36	5.74	9	1.08	3	.56	98	3.66
Electricity	.....	.....	.....	.....	.....	.....	3	.36	7	1.29	10	.37
Miscellaneous causes	75	29.70	118	27.64	232	37.00	237	28.52	149	27.54	811	30.29
Totals and percentages	252	100.00	427	100.00	627	100.00	831	100.00	541	100.00	2,678	100.00
Grand totals, inside & outside	2,248	.....	3,109	.....	4,344	.....	5,491	.....	4,278	.....	19,470	.....

NOTE: This compilation of fatalities for 47 years shows that 92.76 per cent of the accidents inside the mines were caused by falls, cars, gas and suffocation, explosions of powder and dynamite, blasts and falling into shafts and slopes.

The table is of particular value in endeavoring to assess the occupation hazard of the anthracite miner. Throughout the whole period the same causes keep recurring as responsible for the greater part of the deaths. Thus, 92.76 per cent of the deaths inside the mines from 1870 to 1916 were due to falls of material, mine cars, gas and suffocation, explosions of powder and dynamite, blasts and falling of men into shafts and slopes. In spite of all improvements in safety arrangements and increases in inspections, falls of coal, slate and roof keep on killing about half the men who lose their lives in anthracite mines. The mine cars are next in the list of leading causes, and, together with the preceding cause, are responsible for about two-thirds of the deaths inside anthracite mines. If to these two causes be added the deaths due to explosions of gas and suffocation by gas, about three-fourths of the deaths are accounted for. These four causes persist as primarily responsible for the killing of anthracite miners throughout nearly half a century, and little improvement has taken place in all these years.

The important fact, however, in this connection is that the inherent hazard of anthracite mining is increasing from year to year. Mr. Van H. Manning, Director of the United States Bureau of Mines, states:[1]

> "* * * The hazard of mining is undeniably on the increase. The hazard is increasing because mines are becoming larger and are employing more men. Consequently, not only are there many more points in a mine at which accidents may occur, but a great accident imperils the lives of many more men. An explosion that might have killed 25 or 30 men a few years ago may now trap hundreds. Furthermore, the area of worked-out ground is larger, so that there are large numbers of rooms in which gas and dust may accumulate to increase the risk of explosions as well as their violence.
>
> "As mines grow larger they necessarily require more extensive haulage systems, more locomotives and mine cars, and thus the danger from haulage accidents grows."

This general statement as to the steadily increasing hazard in mines is supported by the latest report on anthracite mines of the Pennsylvania State Department of Mines—that for the year 1916. On page 105 of this report, reference is made to the steadily increasing number of State mine inspectors from 1884 to 1916, the report stating that "The great increase in the number of inspectors has not

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[1] Van H. Manning, "Mine Accidents and Their Prevention," in Monthly Bulletin of Pennsylvania Department of Labor and Industry, May, 1916, pages 52-54.

brought about the result desired, namely, a decrease in the number of fatalities in and about the mines."

On page 7 of the same report it is stated: "It is almost incredible that with all the modern safety appliances, the improved methods of mining, the comprehensive mining laws and the stringent rules for the guidance of employees, there should be no reduction in the number of accidents. There are several reasons, however, for this apparently illogical state of affairs. Two of the most important are (1) the mining of coal is now more difficult and hazardous than ever before, and (2) the ignorance and the resultant carelessness on the part of the workers."

(b) *Non-Fatal Accidents.*

The best analysis of accidents occurring in anthracite mines is the detailed study published in the Bulletin of the Pennsylvania Department of Labor and Industry, No. 7 of 1917, entitled "Analytical Tables, Compiled in the Bureau of Statistics and Information, and the Bureau of Workmen's Compensation—Showing Cost of Accidents which resulted in the Killing and Injuring of Miners in the Anthracite and Bituminous Coal Fields of Pennsylvania During the Year 1916" (page 66 and following).

The following statements are derived from this study. The figures include only cases reported to the Bureau of Workmen's Compensation.

During the year 1916, there were 9,413 workers in the anthracite field who were injured to such an extent that they were disabled for more than 14 days, some of them permanently. Besides these, there were 16,979 workers injured and disabled for periods of less than 14 days, the average being 5 days. Together, these two groups number 26,392 workers in 1916. As the number of persons employed was 159,169, this makes 165.8 per 1,000 employees injured in one year, or practically one-sixth of the entire working force. It is needless to state that this proportion of injured workers is extremely high, and is perhaps exceeded only by one or two industries for which no reliable data exist.

The causes of these accidents are so varied that it is impossible to present them in brief space. The leading causes, however, are the same as for the fatal injuries, the falls of material, falls of persons, explosions, mine cars and locomotives, etc., and they emphasize the great difficulty attending accident prevention in anthracite mines.

In the greater part of these accidents the arms and legs were most

frequently injured. These injuries are particularly disastrous in lessening the miners' earning capacity.

The clearest evidence of the high accident rate of the anthracite industry is found in the experience of the Pennsylvania Workmen's Compensation Act. The table given below shows the varied nature of the injuries sustained by anthracite miners, but the most convincing figure is that contained in the last column of the table. If one compensatable accident is taken as the basis, then all the accidents sustained by the anthracite workers involve an annual charge of $1,035 per $1,000,000 of annual payroll. Quarrying comes next, with a charge of $682; bituminous has $621, while the average for all industries is only $240. In other words, anthracite mining is over four times as hazardous as all industries under the compensation act and is over five times as hazardous as the manufacturing industries.

Attention should also be called to column 12 of the table, which gives the rates for death and permanent total disability; anthracite mining has a rate of $5.4 per $1,000,000 payroll; quarrying has $3.00, bituminous mining has $2.9, while for all industries it is $1.00 and for manufacturing only it is but $0.8.

In other words, anthracite mining accidents of all types are five times the average for all industries, and the most serious accidents, namely, the deaths and the total permanent disablements, are likewise over five times the average for all industries.

ACCIDENT RATES IN PRINCIPAL INDUSTRIES FROM JANUARY 1, 1916, TO DECEMBER 31, 1918.

(Source: Ins. Dept. of Penna., etc. Statistical Analysis of Workmen's Compensation Insurance, 1920. Page 40.)

Industry Groups. (1)	Payroll. (000 omitted.) (2)	Number of accidents.								Accident rates per $1,000,000 payroll.				Accident Severity Rates per $1,000,000 Payroll.[1] (15)
		All Comp. (3)	D. & P. T. (4)	Major, permanent, partial. All. (5)	Hand or Arm. (6)	Foot or Leg. (7)	Eye. (8)	Ind. (9)	Temp. Comp. (10)	All Comp. (11)	D. & P. T. (12)	Maj. Perm. Part. (13)	Temp. Comp. (14)	
All industries	$2,715,747													
Anthracite mining..	49,661	88,234	2,814	2,012	538	216	781	445	83,408	33	1.0	0.7	31	240
Bituminous mining..	263,689	3,931	271	96	12	13	34	29	3,564	79	5.4	2.0	72	1,035
Quarrying	25,249	17,778	781	407	62	59	154	116	16,590	67	2.9	1.5	63	621
All manufacturing..	1,157,470	1,663	76	64	6	11	37	10	1,523	66	3.0	2.5	60	682
		38,835	656	931	356	69	377	128	37,253	33	0.6	0.8	32	175

[1] Rating in multiples of One Temp. Comp. Accident.

III. OCCUPATIONAL DISEASES OF COAL MINERS.

There is a long list of diseases to which anthracite miners are particularly liable because of their occupation. The general nature of these diseases has alreadey been referred to in connection with the high mortality of miners. In addition to miners who die from these diseases, there are many who survive, but only with seriously impaired working capacity.

The most important of these afflictions are the respiratory diseases, pneumonia, anthracosis, miners' asthma, etc. It is occasionally stated that these special diseases among miners are not as frequent as formerly, but Bulletin 231 of the U. S. Bureau of Labor Statistics (page 406) gives the warning that "Conclusions based upon fragmentary observations derived from the experience of physicians in coal-mining centers throughout the world cannot be safely applied to modern coal-mining conditions in the United States. The relatively high mortality from asthma, bronchitis and pneumonia is certainly suggestive of more or less health injurious conditions underground, probably directly related to dust exposure, which cannot be explained on any other principle of correlation in disease."

The United States Bureau of Mines, in its Bulletin No. 93, published a special study of Miners' Nystagmus, in which it is stated that while the existence of the disease in the United States is not well known, yet—

> "In view of the foregoing it would seem extremely improbable that an occupational affliction so well defined should be wholly absent in the coal-mining industry of the United States. * * *
>
> "The statistical application of the foregoing considerations to the coal-mining industry of the United States is rather limited at present. No trustworthy data exist which warrant more than an approximate estimate of the probable number of nystagmus cases among American coal miners. According to the statistics of the Bureau of Mines the number of men employed under ground is estimated at 596,470 for the year 1913. As the average rate of new cases of nystagmus reported under the British Workmen's Compensation Act during the five years ended with 1912 had been 9.2 per 10,000 employed, this rate, when applied to the total number of persons employed in coal mining in the United States in the year 1913, given by the Bureau of Mines as 747,644, would indicate the possible, if not probable, existence of 688 new cases of nystagmus per annum. As the cumulative rate of old and new cases under the English experi-

ence by the year 1912 had reached 29.8 per 10,000, this would indicate a possible, if not the probable, number of persons employed in American coal mining and affected with nystagmus as numbering 2,228 for the year 1913. These rates are unquestionably conservative, for they are far from the 5 per cent of ascertained cases for certain mining districts of Germany. If the proportion of American coal-mine employees affected with nystagmus were as high as 5 per cent, the number of such cases estimated for the year 1913 would be 37,382."

In this connection it should be mentioned that the medical examining boards of the War Department, acting under the Selective Service Act, discovered an unsuspected number of young men with this disease. "Nystagmus was found to a marked degree in 854 cases, of which all but 47 were rejected." (Defects Found in Drafted Men, Statistical Information Compiled from the Draft Records, Senate Committee, Printed in Washington, 1919, page 78.)

Aside from the special occupational diseases of the miners, there is the question of their general liability to disease, such as all wage-earners are liable to. In this connection the Pennsylvania State Commission on Health Insurance Report of 1919 states (p. 176):

"Health hazards involved in coal mining are briefly discussed in Dr. Hamilton's study, special emphasis being laid on the high death rate among miners from non-tuberculous diseases of the lungs. This fact is confirmed by the results of the Western Pennsylvania Survey, which, besides finding that the total sickness rate among miners was 8 per cent higher than the general rate for white adult males, states that 'It is probable that the true rate for miners' asthma, involving disability for work, is not less than 400 per 100,000 exposed among anthracite and not less than 175 per 100,000 among bituminous miners. These figures for anthracite and for bituminous miners measure within certain limits of error the incidence of anthracosis among the coal miners in the two groups, asthma being the most prominent symptom, to the lay mind at least, of that condition."

IV. PREMATURE INVALIDITY OF COAL MINERS.

One phase of the miners' occupation which has been but little studied in this country is the early wearing out of the miners' physique. For the German miners some information is available, but accurate data for the United States seem to be lacking. Competent observers, however, have called attention to this early disability of the miners. Thus, Bulletin 231 of the U. S. Bureau of Labor Statistics states on page 414: "There is unquestionably a very considerable amount of needless premature invalidity, as is clearly shown by the experience of German Miners' Associations, and to a lesser extent by the investigations made by life insurance companies in the United States."

The same general observation was made by the Pennsylvania State Commission on Old Age Pensions in its report made in 1919. The Commission found that there were practically no miners over 65 at work in the mines; in explaining this the report says (on page 29) that first, miners age prematurely, and second, that accidents carry them off before they can reach the higher ages. The report states:

> "The low rate of disability due to old age, attributed to skilled mechanics and miners, may be explained by the fact that with the development of modern machine processes men are scrapped much earlier in life and aged men are generally undesirable in the skilled trades. Miners, on the other hand, age prematurely and in both occupations the accident rate runs high—25.44 per cent for miners and 20.28 per cent for skilled groups."[1]

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[1] Report of Pennsylvania Commission on Old Age Pensions, Harrisburg, 1919, page 29.

BEFORE THE UNITED STATES ANTHRACITE COAL COMMISSION

EMPLOYES EXHIBIT NUMBER 11

WHOLESALE AND RETAIL PRICES OF ANTHRACITE COAL 1913 TO 1920

Presented by

W. JETT LAUCK

On behalf of

John L. Lewis, President
Philip Murray, Vice-President
F. P. Hanaway, International Representative
Percy Tetlow, Statistician

John Dempsey
Thomas Kennedy
Chris. J. Golden
} Committee Representing Districts 1, 7 and 9

Of the

United Mine Workers of America

WASHINGTON
1920

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WHOLESALE PRICES OF ANTHRACITE COAL, 1913 TO 1920.

The following table shows the changes which have taken place in f. o. b. mine prices of the principal sizes of anthracite coal from 1913 to June, 1920. For the years 1913 to 1918, inclusive, these prices are taken from the report of the United States Geological Survey, "Prices of Coal and Coke, 1913-1918," published in 1919. The prices for 1919 and six months of 1920 are taken from the market reports of the Coal Age, which is the same source used in the Geological Survey report, and the averages are computed in the same manner. The weighted average of all sizes is arrived at by weighting the sizes specified in accordance with the tonnage of that size shipped, as reported by the Geological Survey.

COMPARATIVE PRICES OF SPECIFIED SIZES OF ANTHRACITE COAL, 1913-1920. F. O. B. MINES—NEW YORK MARKET.

(Unit, Gross Ton of 2,240 Pounds.)

Year.	Egg.	Stove.	Chestnut.	Pea.	Steam.	Weighted Average of All Sizes.
1913	$3.50	$3.53	$3.76	$2.05	$1.23	$2.79
1914	3.58	3.60	3.83	2.08	1.28	2.85
1915	3.59	3.59	3.84	2.05	1.24	2.84
1916	4.04	4.19	4.29	2.48	1.31	3.16
1917	4.52	4.75	4.81	3.83	2.48	3.98
1918	5.04	5.29	5.39	3.99	3.17	4.56
1919	6.29	6.54	6.64	5.24	3.04	5.33
1920 (six months)..	6.84	7.09	7.19	5.66	3.20	5.75

The next table shows the f. o. b. mine prices of all sizes of anthracite coal, by months, from January, 1919, to June, 1920, inclusive. The quotations were taken from the market reports appearing in the Coal Age and averaged by the same method used in the Geological Survey report referred to.

It will be noted that the weighted average of all sizes for 1919 does not agree with the figure in the foregoing table. This is occasioned by the fact that only certain specified sizes are included in the first table, while the second compilation includes all sizes.

The weighted average price of all sizes corresponds very closely to the average sales realization as computed by the Federal Trade Commission.

MONTHLY PRICES OF ALL SIZES OF ANTHRACITE COAL, 1919-1920, PER GROSS TON (2,240 pounds) F. O. B. MINES, NEW YORK MARKET.

(Quotations taken from the Coal Age.)

	Broken	Egg	Stove	Chestnut	Pea	Buckwheat	Rice	Boiler	Barley	Culm	Average Weighted of all sizes.
YEAR 1919											
anuary.....	$6.14	$6.04	$6.29	$6.39	$4.99	$3.46	$2.96	$2.76	$2.46	$1.25	$5.11
ebruary....	6.14	6.04	6.29	6.39	4.99	3.46	2.96	2.76	2.46	1.25	5.11
larch.....	6.14	6.04	6.29	6.39	4.99	3.46	2.81	2.56	2.31	1.25	5.09
pril.....	6.14	6.04	6.29	6.39	4.99	3.46	2.81	2.56	2.31	1.25	5.09
ay.....	6.24	6.14	6.39	6.49	5.09	3.46	2.81	2.56	2.31	1.25	5.15
une.....	6.14	6.24	6.49	6.59	5.19	3.46	2.81	2.56	2.31	1.25	5.21
uly.....	6.14	6.34	6.59	6.69	5.29	3.46	2.81	2.56	2.31	1.25	5.27
ugust.....	6.14	6.44	6.69	6.79	5.39	3.46	2.81	2.56	2.31	1.25	5.33
eptember...	6.14	6.54	6.79	6.89	5.49	3.46	2.81	2.56	2.31	1.25	5.40
ctober (a)..	6.14	6.54	6.79	6.89	5.49	3.46	2.81	2.56	2.31	1.25	5.40
ovember (a)	6.14	6.54	6.79	6.89	5.49	3.46	2.81	2.56	2.31	1.25	5.40
ecember (a)	6.14	6.54	6.79	6.89	5.49	3.46	2.81	2.56	2.31	1.25	5.40
ve. for Yr..	6.14	6.29	6.54	6.64	5.24	3.46	2.84	2.59	2.34	1.25	5.25
YEAR 1920											
anuary.....	6.14	6.54	6.79	6.89	5.49	3.46	2.81	2.56	2.31	1.25	5.40
ebruary....	6.14	6.54	6.79	6.89	5.49	3.46	2.81	2.56	2.31	1.25	5.40
larch.....	6.14	6.54	6.79	6.89	5.49	3.46	2.81	2.56	2.31	1.25	5.40
pril.....	6.14	6.54	6.79	6.89	5.49	3.66	3.06	2.56	2.31	1.25	5.44
ay.....	7.69	7.39	7.64	7.74	5.94	4.16	3.06	2.56	2.31	1.50	6.11
une.....	7.69	7.49	7.74	7.84	6.04	4.16	3.06	2.56	2.31	1.50	6.17
ve. for 6 Mo.	6.66	6.84	7.09	7.19	5.66	3.73	2.94	2.56	2.31	1.33	5.65

The following excerpts from the market reports of the Coal Age are of interest in connection with wholesale prices and are reproduced here:

NEW YORK MARKET (Coal Age, June 3, 1920)—

"One more announcement has been made showing additional increases in wholesale prices. The demand continues strong with no hesitancy in the market absorbing all the coal available. * * * Quotations for independent buckwheat ranged from $4 to $5 at the mine, rice $2.75 to $3 and barley $2 to $2.50."

PHILADELPHIA MARKET (Coal Age, May 27, 1920)—

"All shippers have now announced a price schedule for the current month. The biggest shipper announced prices from May 11 as follows:

Broken	$7.50
Egg	7.20
Stove	7.45
Nut	7.55
Pea	5.75
Buckwheat	4.10

(Other sizes to remain unchanged)

(a) No prices given in Coal Age. Next prices shown are Jan., 1920, which are the same as Sept., indicating no change in interim.

"These are the lowest prices for any Company, the nearest other big company being 15c higher on egg, 25c higher on stove, 15c on nut and 25c on pea." (Gross ton, f. o. b. mine.)

(Coal Age, June 3, 1920)—

"As to prices now prevailing, some of the independent shippers quote from $9.50 to $10 on egg, stove and nut. Usually the higher price is asked when the buyer refuses to take any pea coal; quotations on this size have run from $6.25 right up to $7.00. * * * No trouble is experienced in getting $4.25 for buckwheat and plenty of sales are made at figures 25c higher than that. Rice clings close to $3.25."

(Coal Age, June 10, 1920)—

"The biggest shipper recently advised the trade of an advance of 10c a ton on egg, nut and pea. * * * Soon most of the other producers followed the lead of the big company, a few even putting on more than 10c. The following table notes the comparison between company and individual average prices on domestic sizes:

	Egg	*Stove*	*Nut*	*Pea*
Company.....	$7.30	$7.55	$7.65	$5.85
Individual	8.35	8.60	8.60	6.50

"The company price on buckwheat is still $4.10. * * * Independent shippers have no difficulty in getting 25c above that price."

Boston Market (Coal Age, May 27, 1920)—

"With the announcements on May 15 and May 17 of the old-line companies, that advances of 85c to $1 would be effective from these dates, practically every anthracite shipper is now on a new price basis."

Buffalo Market (Coal Age, May 27, 1920)—

"The fixing of the price of hard coal has added 85c a ton to the wholesale prices of the leading sizes with a ten-cent monthly addition besides."

General Market (Coal Age, June 10, 1920)—

"The following quotations are from a number of prominent anthracite producers for the month of May at the mines:

	Egg	Stove	Chestnut	Pea
Philadelphia and Reading C. & I. Co....	$7.20	$7.45	$7.55	$5.75
Lehigh Coal and Navigation Co.....	7.35	7.70	7.70	6.00
Whitney and Kemmerer.....	8.25	8.50	8.50	6.50
Markle & Co. (Jeddo).....	8.35	8.70	8.70	6.80
Markle & Co. (Highland).....	8.55	8.80	8.80	6.90
Pardee & Co. (Lattimer).....	8.25	8.50	8.50	6.50
M. A. Hanna & Co.....	8.10	8.45	8.45	6.30
Maderia Hill & Co.....	8.10	8.45	8.45	6.50
Wentz & Co.....	8.10	8.45	8.45	6.50
Lineaweaver & Co.....	8.35	8.60	8.60	6.25
Weston, Dodson & Co.....	8.50	8.50	8.50	6.50

RETAIL PRICES OF ANTHRACITE COAL, 1913-1920.

The following table shows the price changes which have taken place since 1913 in the two sizes of anthracite coal, stove and chestnut, in most general use for domestic purposes. The shipments of these sizes in 1918 were approximately 30,000,000 tons, or about 40 per cent of the total shipments of anthracite in that year. In previous years they constituted even a larger proportion.

The prices from January, 1913, to January, 1920, inclusive, are average prices secured by the U. S. Bureau of Labor Statistics, published in the Monthly Labor Review for March, 1920. Those for June, 1920, were secured from representative retail dealers during the week ending June 12th in the eight cities covered by the investigation. These are the principal anthracite consuming centers of the country. Quotations were secured from eight to fourteen dealers in each city and an average computed.

It may be noted that in Baltimore, Boston, Bridgeport and Providence the prices quoted by retail dealers were exactly uniform. In the other cities there were slight variations in retail prices. It was found that the local custom of quoting prices for a long or short ton was adhered to by all dealers. All of the prices are on White Ash grade, delivered a reasonable distance, but do not include extra charges where additional handling is necessary.

The greatest increases in prices for June, 1920, over January have evidently occurred in the New England district, in some instances as much as $2.50 per ton of 2,000 pounds. In all of the cities covered an advance in retail prices is shown to have taken place.

RETAIL PRICES OF ANTHRACITE COAL, FOR HOUSEHOLD USE, ON JANUARY 15 AND JULY 15 OF EACH YEAR, 1913 TO 1919, INCLUSIVE, AND JANUARY AND JUNE, 1920, BY CITIES.

Cities.	1913.		1914.		1915.		1916.		1917. (a)	1918.		1919.		1920.	
	Jan.	July.	Jan.	July.	Jan.	July.	Jan.	July.	Jan.	Jan.	July.	Jan.	July.	Jan.	June.
Baltimore Md.															
Stove .....(b)	7.70	7.24	7.70	7.28	7.62	7.14	7.65	7.80	8.16	9.60	10.45	11.98	11.75	12.50	13.50
Chestnut .....(b)	7.93	7.49	7.95	7.52	7.87	7.36	7.88	7.95	8.31	9.75	10.55	12.05	11.85	12.60	13.60
Boston, Mass.															
Stove .....(c)	8.25	7.50	8.00	7.50	7.75	7.50	8.00	8.00	9.50	9.85	10.25	12.00	12.00	12.75	14.50
Chestnut .....(c)	8.25	7.75	8.25	7.75	8.00	7.75	8.25	8.00	9.50	9.85	10.25	12.00	12.00	12.75	14.50
Bridgeport, Conn.															
Stove .....(c)	.....	.....	.....	.....	.....	.....	.....	.....	10.00	10.50	10.40	12.37	11.75	12.50	15.00
Chestnut .....(c)	.....	.....	.....	.....	.....	.....	.....	.....	10.00	10.50	10.40	12.37	11.75	12.50	15.00
New York, N. Y.															
Stove .....(c)	7.07	6.66	6.86	6.85	7.14	6.91	7.11	7.39	8.50	9.06	9.30	10.76	10.80	11.54	12.65
Chestnut .....(c)	7.14	6.80	7.00	6.99	7.28	7.06	7.25	7.42	8.50	9.08	9.29	10.76	10.86	11.60	12.70
Philadelphia, Pa.															
Stove .....(b)	7.16	6.89	7.28	7.05	7.25	7.01	7.25	7.49	7.97	9.59	9.81	11.24	10.85	11.88	13.35
Chestnut .....(b)	7.38	7.14	7.53	7.30	7.50	7.26	7.50	7.74	8.19	9.68	9.89	11.32	10.95	11.91	13.35
Providence, R. I.															
Stove .....(c)	8.25	7.50	7.75	7.45	7.75	7.50	8.75	8.50	10.00	10.50	11.38	12.40	12.00	12.95	15.00
Chestnut .....(c)	8.25	7.75	8.00	7.70	8.00	7.75	9.00	8.50	10.00	10.50	11.38	12.40	12.00	13.00	15.00
Scranton, Pa.															
Stove .....(c)	4.25	4.31	4.50	4.31	4.44	4.13	4.38	4.80	5.25	6.11	6.05	7.48	7.68	8.23	8.94
Chestnut .....(c)	4.50	4.56	4.75	4.56	4.69	4.31	4.63	4.80	5.25	6.15	6.15	7.56	7.78	8.30	8.94
Washington, D. C.															
Stove .....(b)	7.50	7.38	7.59	7.42	7.73	7.40	7.63	7.73	8.21	10.10	9.96	11.89	11.91	12.45	13.55
Chestnut .....(b)	7.65	7.53	7.74	7.57	7.88	7.55	7.78	7.86	8.20	10.19	10.06	12.02	12.01	12.54	13.51

The prices quoted are for coal delivered to consumers but do not include charges for storing in coal bin where an extra charge is made for handling.

(a) Prices not secured by Bureau in July, 1917.
(b) Per ton of 2,240 pounds.
(c) Per ton of 2,000 pounds.