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Mr. Harney

MECHANIZATION OF COAL MINES AND WHAT IT WILL
DO FOR ITSELF AND THE COUNTRY.

In discussing this question, I shall feel at liberty to go far afield, and shall probably digress from the subject, but I shall endeavor to "keep within the one mile wide and one inch deep", as the standard set by a former noted State Senator from Sweetwater County, at present a member of this Club.

This, I feel, will give me all the latitude I desire and if I wander quite freely, I shall only do so as a means of correlating the several viewpoints on the subject, as it is extensive and presents many angles.

With this in mind, I shall proceed feeling at perfect liberty to exceed the rather meagre time the Chairman has allotted me and continue until I have finished my presentation of the subject as I notice this is a custom quite widely followed by some of the speakers at meetings of this kind.

The question of mechanization of coal mines is a large one, and outside of the mining fraternity very little understood, so it may not be out of place to state briefly what is meant when we talk of the mechanization of coal mines. It means the mining, drilling and loading of coal by machinery, instead of by hand work, and the hauling of coal with locomotives, instead of with live stock. Mining, drilling and hauling of coal for years have been done extensively with machinery; for example, in 1900 only 3% of the coal mined in the United States was mined by machinery; in 1926, 70% was so mined, the drilling and hauling increasing but probably in a lesser ratio. On the other hand, the loading of coal mechanically is of very recent origin.

From 1923 to 1925, the increase in loading machines in the United States was 176% and in amount of coal loaded 232%. Only 1,879,726 tons were mechanically loaded in 1923, during 1924, 3,495,222; in 1925, 6,243,104 tons; 1926, probably 10,000,000 tons. Mechanization of mines is here to stay and the operating officials of coal mines who do not realize this are doomed to have a rude awakening.

Wyoming has not been behind in the mechanization of its mines. In 1887, a number of air driven coal cutting machines and drills were installed in No. 4 Mine of The Union Pacific Coal Company at Rock Springs and were in continuous operation till 1910, when they were superseded by the more modern electric coal cutters and drills. In 1891, the first electric haulage locomotive was installed in Union Pacific Mine No. 7 at Rock Springs. This locomotive being one of the first electric locomotives placed in operation by any mining company.

In 1916, mechanical loading machines were installed at Union Pacific Mine No. 4, Hanna, and are still operating. Since 1923, other types of loading machines have been placed in use, in that and other mines of The Union Pacific Coal Company. Installations have also been made at the Gunn-Quealy Coal Company mine at Sweetwater, at the Kemmerer Coal Company's mines near Kemmerer and at the Sheridan-Wyoming Coal Company's mines near Sheridan.

In 1925, Wyoming loaded mechanically 579,272 tons and in 1926, 1,472,935 tons. The percentage of increase of coal loaded mechanically has been greater in Wyoming than in any other State.

One of the extremely interesting automatic loading devices is known as the McCarty Duck Bill, patented by F. L. McCarty, Mine Superintendent, of this city, later assigned to the Eickhoff Manufacturing Company of Germany, being developed and placed on the market by them. Seven of these duck bills or self-loaders are in use in The Union Pacific Coal Company's mines in connection with shaking conveyors, others being rapidly put in service in the Union Pacific mines and also throughout the United States.

What will mechanization of coal mines do for the industry and for the country? It will do nothing for the nation until it has done something for itself. Mechanization will help the industry by bringing a greater composure to it. Heretofore, it has been looked upon as an outlaw industry, surviving on strikes and lockouts.

Mechanization will encourage and bring to the industry a better type of labor generally. Men, and particularly young men, will take up mining work, because of the remuneration it will offer and the less exhausting effort required to make a living. These men, devoid of the tradition of the mines, will bring to their labor more enthusiasm and a different viewpoint on account of their early educational advantages; the industry of coal mining will be developed on a higher plane because they will work, not so much with exhausting muscular effort, but will use their mental faculties more. In brief, factory methods will be brought to the work of the mines just as they have been adapted to the automobile and other progressive industries, and the work of the mines will be systematized and co-ordinated in comparison with the rather loose methods employed under the present system of mining.

Multiple shifts will also be worked to give a better return on the investment. Labor turnover will be reduced to a minimum, from the present 100% a year to probably 10% per year or less. This will come about, because men will like their jobs better.

With the adoption of bathhouses at the mines, mine employes will be able to come home in their clean clothes, and in going to their homes it will not be necessary for them to travel the back streets of the town in which they live, as many do at present, on account of their personal appearance; so they will have a greater measure of self-respect on account of being able to reach their homes washed up and in their home clothes as any other artisan. Much of the grime and dirt attached to the industry of coal mining will be eliminated.

When the industry shall have purged itself of the Bolshevik, whether he be of the operator class or of the miner class, with the aid of mechanization the history of coal mining in the next few years will be largely a survival of the fittest, those who have the courage to break away from the tradition of the mines, embarking on uncharted seas with confidence in their ability to succeed.

But you are saying, that is all very good, but what we are interested in is what will mechanization do for the nation and for our community?

First, it will reduce the number of mines in operation, the operating mines will be more intensively worked and a larger tonnage will be obtained per mine opening.

Second, mines will be worked multiple shifts, two or possibly three shifts in each twenty-four hours. Equipment will be steadily employed, with a consequent lesser depreciation charge, this representing in itself a large saving alone, Eugene McAuliffe in a paper recently presented before the American Mining Congress and in his book "Railway Fuel" has set this forth very clearly.

To illustrate this point, a specific example was taken which assumed 1000 acres of coal land with a total investment of \$300,000, which is not large, the same to be mined in twenty-one years by the present method of single shifting.

Again he assumes that by double shifting and triple shifting the mine could be exhausted in 10.5 years and 7 years respectively. The detail is too long to give here but it has shown that the spread of interest, taxes, maintenance, power, etc., over the three periods would result in the following saving:

	<u>Two Shift Basis (10.5 years)</u>		<u>Three Shift Basis (7 years)</u>	
	<u>Per Year</u>	<u>Per Ton</u>	<u>Per Year</u>	<u>Per Ton</u>
Interest & taxes	\$ 12,000	\$.0171	\$ 24,000	\$.0228
Maintenance	70,000	.1000	140,000	.1330
Power	3,500	.0050	6,930	.0066
Total	\$ 85,500	\$.1221	\$170,930	\$.1624
Total for exhaustion period -	\$897,750		\$1,194,060	

Reinvestment of annual savings at 6% over the twenty-one period required to exhaust the mine on the single shift basis gives the following:

	<u>Two Shift Basis</u>	<u>Three Shift Basis</u>
Savings invested for 21 years	\$2,220,116	\$3,237,410

Further figures are given to show that if this same mine were equipped to load mechanically, assuming the previous installation of mining machines, the

Following additional capital would be required with the investment cost per ton of annual output:

1 Shift	350,000 tons	\$100,000	or	\$.286 per ton.
2 Shifts	700,000 "	120,000	or	.171 " "
3 Shifts	1,050,000 "	130,000	or	.124 " "

Third, the mines will operate more days per year, instead of about half time as at present.

Fourth, the class of labor employed will be of a high order, as there will be a demand for mechanics, electricians and other highly trained men, who will not be migratory as men will like their jobs and will stay permanently. The "Boomer" will be eliminated and his passing should cause no sorrow among you business men particularly, as he contributed but little to the up-building of any community.

Fifth, employment will be provided for the boys who are being educated in the High Schools. Many of these boys, after being educated, did not desire to take up mining work on account of the severe muscular effort necessary, required to shovel coal into a pit car, but when a good living can be had with the handling of levers, these boys will not hesitate to take up mining work.

Sixth, coal will eventually cost less to the public but the savings for several years will probably be taken up by high depreciation charges necessitated by the obsolescence of equipment, made necessary by the adoption of new machinery which will be developed. However, the cost of coal even to those not engaged in the mining industry in Rock Springs has not been excessive.

Seventh, the transition from hand loading to mechanical loading will be gradual. It took twenty-five years to get to the point where 70% of the coal is mined with mining machines. I do not look for the transition period from hand loading to mechanical loading to be so extended but the change will not be revolutionary, probably being such as to take up any shortage of labor that may ensue,

The business depression in Rock Springs lies deeper than any question of

mechanization. You will understand this better, and I am sure you will be interested in some figures which I will give you, after you have studied these figures.

The output from the Union Pacific mines is less than it was in 1923 but this is largely accounted for by the fact that the Union Pacific Railroad Company is purchasing quite a large tonnage from what are known as the commercial mines, so we may consider that the Union Pacific Railroad consumption of coal mined in this district is about the same from year to year. One looking over the commercial production will see that this is where one of the chief troubles lies.

A study of the State Mine Inspector's report discloses the fact that for the year 1919 (apparently a year of normal production) and for the year 1926, there is a very large decrease in production for the period covered by these years.

<u>Company</u>	<u>Production 1919</u>	<u>Production 1926</u>
Central Coal & Coke Co.	330,278	232,360
Colony Coal Co.	198,100	159,266
Gunn-Quealy Coal Co.	256,466	190,708
Lion Coal Co.	221,915	196,891
Megeath Coal Co.	332,440	144,537
Premier Coal Co.	120,222	89,220
Rock Springs Fuel Co.	47,417	67,482
Superior Rock Springs Coal Co.	122,733	80,613
Wyoming Coal Co.	97,833	-
Total	1,727,404	1,161,077

A decrease in the eight year period of 566,327 tons or 33%

This represents a decrease in pay roll of about \$800,000.00, with a further decrease in pay roll on account of economies in operation for all companies including The Union Pacific Coal Company of about \$200,000.00 per year, so that the net shrinkage of pay roll in the Rock Springs field from these causes is about \$1,000,000.00 per year.

There are, no doubt, about 1,000 fewer men engaged in mining in the Rock Springs field, including all mines in Rock Springs and within a radius of twenty-five miles, about 600 of these due to and chargeable to shrinkage in output and the other 400 due to former over-crowding of the mines. The latter should not be

taken into consideration in figuring the net shrinkage in men as they merely reduced the net earnings of other employees. The total pay roll for The Union Pacific Coal Company at Rock Springs, Reliance, Winton and Superior in they year 1926 amounted to \$3,552,575. That of other companies within the same radius approximately \$1,741,615 for labor alone, making an approximate total of \$5,294,190.

It may be of interest to you to know the earnings of all Union employees in The Union Pacific Coal Company system, the figures given not including supervisory or clerical forces, and a comparison of these wages with the earning of employees of class one railroads. These figures furnished me by Mr. McAuliffe.

	Class one railroads 1925	The Union Pacific Coal Co. 1926
Average days worked per year	324.17	208.38
Average ratio working time	105.9%	68.1%
Average rate per day 8 hrs.	\$ 5.06	\$ 9.43
Average earnings per month	136.44	163.76
Average earnings per year	1,637.25	1,965.12

Note 1. If mine employees worked 324.17 days per year, then average earnings would be monthly \$254.20, yearly \$3,050.43.

Note 2. Class one railroads includes all carriers with annual operating revenue above \$1,000,000.00 representing 90% of railroad mileage in the U. S. and 96% of railroad revenues. You will note that, although The Union Pacific Coal Company employees worked 37.8% less, the yearly earnings were \$327.87 greater than the average earnings of the railroad employees. The statement of earnings of class one railroads is the latest one available from the Interstate Commerce Commission and I may say that it is complete, including the salaries of executives, officials and staff assistants, as well as daily and monthly employees. A similar statement prepared by the U. S. Bureau of Labor for year ending June 30th, 1926, gives an annual earning of all railroad officials and employees as \$1,648.00 but does not give the number of days worked. The statement of The Union Pacific Coal Company does not include any salaried Non-union men, being compiled from the earnings of employees who are members of the U.M.W. of A.

Coming back again to the shrinkage of output from commercial mines, some of this is due to loss of markets caused by competition from other States, from oil and gas and electricity, a very perceptible tonnage displaced in Rock Springs by gas, people finding it a more convenient fuel, the shrinkage still further caused by agencies beyond the control of the operator. For example, figures given out by the American Railway Association state that for every one thousand gross freight ton miles in 1920, 197 pounds of coal were used; in 1925, 159 pounds and in 1926, 155 pounds, a decrease of 21% in six years.

Public Utility Plants, according to the U. S. Geological Survey, consumed an average of 3.2 pounds of coal per K.W.H. generated in 1919; 2.1 pounds in 1921, and in 1926 the average is estimated at 1.9 pounds per K.W.H. Many individual plants did much better than this, generating one K.W.H. with a little less than one pound of coal, so that is part of the story. Everyone is seeking for better efficiency in the particular business in which he is engaged, the various business interests represented here tonight being no exception.

Some further figures on the fuel situation which are pertinent show very clearly the trend of the consumption of fuel on the Union Pacific System. You will be interested, as it shows clearly the comparative quantities of coal and oil used. I stated in an earlier part of the address that fuel consumption, in so far as this district was concerned, did not vary greatly from year to year but you will note that this is not true of the System, a reduction of 19.3 per cent apparent from 1923 to 1926. The figures I give you are summaries of fuel issued, the summaries compiled from monthly reports.

Fuel oil issued and charged out to System lines, 1925 and 1926.
(Barrels)

	<u>U.P.</u>	<u>O.S.L.</u>	<u>O.W.</u>	<u>St.J.&G.I.</u>	<u>L.A.&S.L.</u>	<u>Total</u>
Total 1926	59,916	9,895	989,407	278	1,981,651	3,038,147
Total 1925	41,721	11,166	994,837	169	2,034,278	3,082,171
Increase	15,195			109		
Increase	36.4%			39.2%		
Decrease		1,271	5,430		52,627	44,024
Decrease		11.4%	5%		2.6%	1.4%

Line	1923	Summary for four years		1926
		1924	1925	
U.P.	27,483	30,246	41,721	56,916
O.S.L.	12,455	12,641	11,166	9,895
O.W.	659,709	1,017,694	994,837	989,407
St. J. & G. I.	3	59	169	278
L.A. & S.L.	1,719,398	2,087,127	2,034,278	1,981,651
Total	2,419,048	3,147,767	3,082,171	3,038,147

Similar figures for coal are:

	U.P.	O.S.L.	O.W.	St. J. & G. I.	L.A. & S.L.	Total Tons
Total 1926	2,772,518	800,255	465,030	90,186	9,019	4,137,008
Total 1925	2,745,165	828,240	454,182	86,654	9,520	4,123,761
Increase	27,353		10,848	3,532		13,247
Increase	1%		2.4%	4.1%		.3%
Decrease		27,985			501	
Decrease		3.4%			5.1%	

Line	1923	Summary for four years		1926
		1924	1925	
U.P.	3,230,992	2,915,276	2,745,165	2,772,518
O.S.L.	975,148	877,270	828,240	800,255
O.W.	676,523	475,771	454,182	465,030
St. J. & G. I.	103,822	89,415	86,654	90,186
L.A. & S.L.	140,884	15,312	9,520	9,019
Total	5,127,369	4,373,044	4,123,761	4,137,008
Reduction from 1923	-	745,325	1,003,608	990,361
		14.7%	19.5%	19.3%

Coming back again for a moment to the depression in the coal industry, in Wyoming and in other parts of the United States where similar conditions prevail, I am sure that you will be interested in a few figures which I have on the relative production in Union and Non-Union fields. Coal operators of Wyoming, I know, are deeply concerned over this situation, as we are surrounded by Non-Union territory, the states of Colorado, New Mexico and Utah being Non-Union, in the two former very considerable recession in the wage scales taking effect, Utah ostensibly paying the Jacksonville scale; but production costs very materially reduced on account of much dead work done by the miners without compensation.

Production figures, showing production of bituminous coal in what has been known as the Central Competitive field (Union), comprising Pennsylvania, Ohio, Illinois and Indiana, are illuminating when compared with production for like period in the three Non-Union states of Kentucky, Virginia and West Virginia,

Pennsylvania, Ohio, Illinois & Indiana - Union

<u>Year</u>	<u>Tons Produced</u>	<u>Ratio 1923 & 1926 to 1918</u>	<u>Ratio 1926 to 1923</u>
1918	344,333,423	100	
1923	317,965,530	92	100
1926	272,808,000	79	85

Kentucky, Virginia and West Virginia - Non-Union

1918	131,737,360	100	
1923	160,438,901	124	100
1926	224,808,000	174	136

The figures for the Central Competitive field do not tell the whole story because Pennsylvania is partially Non-Union and this part of the Central Competitive more than held its own, the shrinkage in output, however, being twenty-one per cent, while the three Non-Union states increased their production 70 per cent and from 1923 to 1926, the Central Competitive field including all of Pennsylvania shrunk fifteen per cent, while the three Non-Union states increased their production thirty-six per cent, this latter period embracing what is known as the Jacksonville wage agreement with the U.M.W. of A., the wages in the Non-Union field very perceptibly less than that paid in the Unionized fields. I am quoting you these figures to show you that the maintenance of Union conditions with the attendant high wage scale, when compared with Non-Union territory and lesser remuneration, have been rather disastrous to the mine production of the Unionized states. The same thing is true as between Wyoming Unionized and the contiguous Non-Union states, although probably to a lesser degree.

The increase in the tonnage of the Non-Union states has been obtained by reducing the wage scale so it is inevitable that the fields where the higher wages are being paid must, in order to hold their business, either reduce their wages, surrender their business, or develop a measure of increased efficiency that will enable them to meet the reduced costs established by the low-wage fields. The Union Pacific Coal Company has studied earnestly all phases of the situation and is committed to the third plan, that of building up its efficiency by every legitimate method at its command, employing every effort possible in this direction, before giving consideration to other methods. Hence, you will understand not only the compelling need of mechanizing our properties but also the necessity of using every other means for efficient operation.

The only thing that suggests itself to me for lost revenue, is to try to substitute something else in its place. There is a good deal of land within fourteen miles of Rock Springs on the north which could be cultivated by small farmers, each having say not more than five acres. Hay, grain and hardy vegetables can be grown if a supply of water can be obtained. Poultry would also find a ready market in Rock Springs. I believe a sufficient amount of water could be developed by drilling wells, but this could be definitely determined by the aid of a reclamation expert.

The trade tributary to Rock Springs should be developed, by building good roads.

Again, I think the people of Rock Springs generally could aid in boosting the use of Rock Springs coal by sending letters to their friends who reside in the States where Rock Springs coal is sold commercially. I am sure that the operators who are engaged in selling coal would be glad to furnish the Lion's Club with a list of the states and the towns where each of them ship, so that such a system of advertising may be inaugurated. There are also many auto tourists who pass through our

city. Literature on the splendid qualities of Rock Springs coal should be distributed to them. A small case with samples of Rock Springs coal kept at the camp grounds might assist, with a supply of advertising material accessible.

A large sign, illuminated at night, placed in a conspicuous location that might be read from the trains telling of the splendid qualities of Rock Springs coal, I am sure, would be of benefit. These are only a few suggestions. Others here I am sure could develop many others. It was noted on a recent trip over the Short Line into the Northwest that Utah coal was extensively advertised by coal dealers. None, however, was noted for Wyoming coal. Here, it seems to me, is an opportunity for commercial advertising.

Thirty-five slides were then shown of the mechanical loading operations of The Union Pacific Coal Company.