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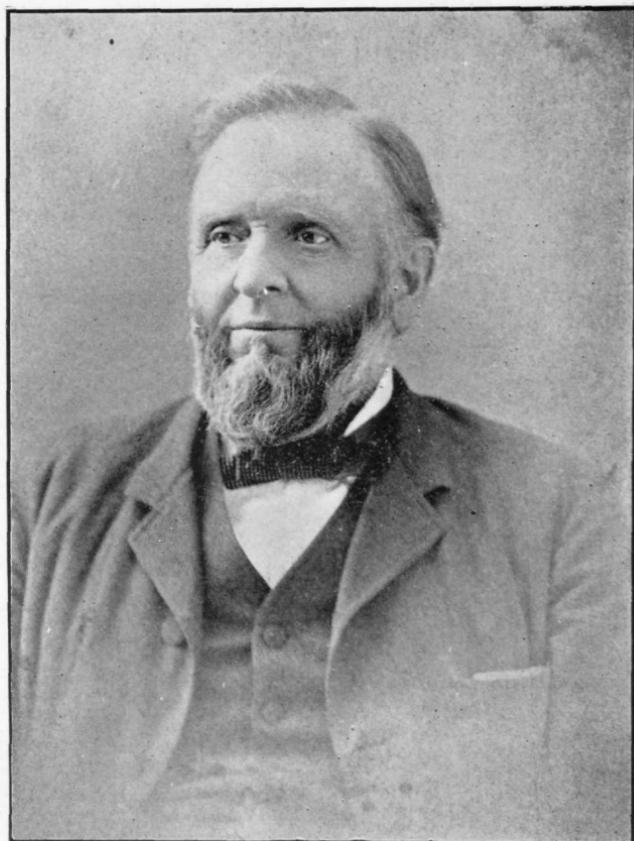
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JACOB G. CHAMBERLAIN.

A TRAMP'S VISIT TO SOUTH WESTERN COLORADO AND NORTH WESTERN NEW MEXICO, WITH DURANGO AS A STARTING POINT.

BY J. G. CHAMBERLAIN.

The City of Durango is located on the Animas river and at the junction of the Rio Grande Southern Railroad, the Denver & Rio Grande and the Silverton branch of the D. & R. G. R. R.; it has a population of over 6,000 inhabitants. Many new buildings, dwelling houses, business blocks and manufacturing establishments are being erected. The city has water-works, and the second largest electric plant in the State is being built; also an electric street railway. The leading manufacturing industries of the city are: The San Juan Smelting & Mining Company, which has six furnaces with a capacity each to consume 50 tons of ore daily; but as there are constant repairs to be made it would not be safe to estimate that over five furnaces would be run constantly. Upon this basis the plant would use daily 250 tons of ore, 50 tons of limestone, 50 tons of coal and 30 tons of coke, making a total of material used in the smelter daily, 380 tons. The bullion produced by this company will be 1-7 of 250 tons daily, which would be 35½ tons. Mr. J. A. Porter, Advisory Director, informed me if the Albuquerque, Colorado and Utah Railroad was built he would contract at once to bring over the road from 100 to 150 tons of ore daily, from Mexican mines, and in the near future they might bring in from 500 to 1,000 tons daily; in this event he contemplated the enlargement of his smelter.

The next important industry is the Standard Smelting and Refining Company. This is a new plant just completed, especially designed to smelt and reduce copper ores and for reducing and refining under the electric process the gold and silver ores. The plant for reducing these ores is not completed. The smelter is a model of its kind and is probably not surpassed by any in the United States. This smelter has a capacity to reduce 150 tons

of copper ore daily, and when their electric smelting plant is completed they expect to use several hundred tons daily of gold and silver ores. The manager informed me that if the road to Albuquerque were completed they would likely get most, if not all of the copper ores from Mexico.

The other manufacturing industries are: Durango Iron Works. It is a well-equipped foundry and machine shop; capital stock, \$50,000.00. Durango Ore Sampling Works; capital stock, \$25,000.00; receives from 8,000 to 9,000 cars of ore yearly or about 85,000 tons. Two flouring mills, using about 250,000 bushels of wheat annually. Four saw-mills; two large brick works, making 80,000 brick daily; lime kilns, and a coking plant of forty ovens.

There are four banks, two daily papers, six churches, courthouse and school buildings.

This city will continue to be the metropolis of southwestern Colorado and the general distributing point for this portion of the State and northwestern New Mexico and southeastern Utah, and is exceptionally well located for smelting the gold and silver ores in the great producing districts of Rico, Telluride, Silverton and Red Mountain—in fact all southwestern Colorado—having in its immediate vicinity an almost unlimited supply of an excellent quality of steam and coking coals and limestone of unusual purity. Coal mines are now being worked on all sides of the city in the mountains near by; but from all the information I can gain I judge the great body of coal lies to the south, west, and northwest of the city. I carefully traced and examined it for 50 miles to the northwest, and am credibly informed that the basin extends fully the same distance southeast, south and still further to the southwest. The coal field is sufficiently large to supply all demands that will be made upon it for generations to come. The seams of coal run from 3 to 10 feet in thickness, but not likely to be over 6 feet solid coal without partings in any one seam. The cost of mining coal in this vicinity will be from 20% to 30% higher than in Ohio and Pennsylvania for similar coals. The actual cost delivered on cars will run from 80 cents to \$1.25 per net ton, run of mine coal. Most of the coals examined were of excellent quality as will be seen by analysis. Some of the seams make an excellent quality of coke which will fill any demands made upon it for fuel or smelting purposes. The capacity of the different mines opened in this vicinity is not far from 1,500 tons daily. The freight charges may have something to do in limiting the market to the present demands. They would make the managers of Ohio railroads envious. They are as follows:

To Durango, 15 miles.....	\$ 50 per ton.
To Silverton, 60 miles.....	2 75 per ton.
To Rico, 75 miles.....	5 00 per ton.
To Telluride, 110 miles.....	6 00 per ton.

The building material at Durango is exceptionally good. The brown sandstone, one dark and the other light brown, can scarcely be excelled. They are a strong, compact sandstone and can be quarried any size required for building. I saw blocks 15 feet long and 12 inches thick and 16 inches wide, split nearly straight as a line. The beauty, durability and strength of these sandstones should find a market long distances from where they are quarried. The light colored sandstone of excellent quality is very abundant.

The brown sandstone is brought from quarries some 60 or 70 miles on the Rio Grande Southern Railroad, and from a personal examination I can say that the quantity is unlimited.

Commencing at Durango, I will take up in detail the different mines examined.

First—the Porter mine, some $3\frac{1}{2}$ miles from town and on the line of the Rio Grande Southern Railroad, capacity 500 tons daily; they were mining 250 tons daily. Full thickness of seam is 4 feet, but they are only taking out 3 feet of the coal, the top foot being slaty. This seam of coal makes an excellent quality of coke, resembling very much the New River coke of western Virginia, but contains a little more ash. It makes an excellent fuel to smelt the gold and silver ores and would be a superior coke for smelting iron ores in a blast furnace. This coal will not bear transportation as well as some other coals, but is low in ash and sulphur, and makes an excellent steam and domestic fuel. It extends over a large area.

Thirty feet above this seam (the mine superintendent told me), is a 4 foot seam of excellent quality of coal for steam and domestic use. I could not verify this, as I could not get into the mine. The Porter seam is opened in three other places within a mile of the town, but are worked only in a limited way.

Two miles east of town the Harbaugh Bros. have opened a mine, coal 3 feet thick and of excellent quality. They mine only 25 to 30 tons daily.

The next mine visited is located about $3\frac{1}{2}$ miles east of Durango—the Southwest Coal Company. This seam of coal is of remarkable thickness, but has several partings of slate in it. Full thickness of seam $10\frac{1}{2}$ feet. Coal 12 inches, slate 2 inches, coal 12 inches, slate 2 inches, coal 12 to 14 inches, slate 2 inches, coal 4 feet, slate 6 inches, coal $2\frac{1}{2}$ feet.

At present they mine only the 4 foot seam. The quality is very good if slate is kept out of it. Both the 4 foot and the 2½ foot are coking coals. Capacity of the mine is 300 tons daily. Price paid for mining is 70 cents per ton for lump coal—about 25% of coal mined goes into nut coal and slack.

Two analyses of this coal show as follows:

	First.	Second.
Moisture	1.51	1.31
Volatile matter	33.36	39.70
Fixed carbon	58.88	54.78
Ash	6.12	4.22

This coal is low in sulphur.

The next mine visited was the Ute Coal & Coke Company's on the Rio Grande Southern Railway, 15 miles northwest from Durango. It is well opened and has a capacity of 500 tons daily. The full thickness of the seam is 5½ to 6½ feet, including a parting of selicious shale of 1 to 2½ inches, which lies 12 inches from bottom of seam. All the coal is of excellent quality, black in color and mines in large blocks, too large to be handled by the miners without breaking up. If carefully mined will not make over 20% of nut and slack coal, running over a 1¼ inch screen. In fact I see no use of screening this coal, as the run of mine looks better than most of screened coal that I have seen in the East, and for all purposes I would just as soon have it as the lump coal. It is said it is not a coking coal, but I am confident that if it was disintrigated it would make an excellent coke. They are only mining the upper bench of seam at the present time, which is seldom less than 4 feet in thickness and often runs up to 5 feet. It would be economy to mine full thickness of seam and pick out the slate. This coal is quite low in ash and sulphur and would sell in any market and would bear transportation remarkably well. Price paid for mining is 62½ cents per ton for run of mine. This coal should be delivered on cars at cost of \$1.00 per ton for lump coal, and with all the modern appliances for mining coal for considerable less.

This is a very interesting field of coal and of great value. There is a fault or break in the stratas which will give them some trouble in mining unless they get beyond it. There are five seams of coal in the hills at this place, as I was informed by the manager, Mr. Jackway, the stratas dip to the south and all of the seams of coal should be found for 50 miles from Durango, south.

Below is section of the strata as given me by Mr. Jackway, showing the coal in the hills at this mine:

Coal $5\frac{1}{2}$ to $6\frac{1}{2}$ feet, 1 to $2\frac{1}{2}$ inch parting (seam now being worked), rock 8 feet, coal 3 feet, no parting, rock 60 feet, small seam of coal 1 to 2 feet, rock 40 feet, coal, 3 feet, sand rock, parting, 2 to 4 inches. coal $6\frac{1}{2}$ feet, bright dark color of excellent quality.

The lower and thickest seam will be worked by this company as soon as they can open it, as they consider it the best coal they have. I presume this section shows about all the seams of coal in this great basin. Undoubtedly there will be changes in the thickness and quality of these coals found in different localities.

Analysis of the 10 foot seam of coal, Ute mines, as given me by Mr. Jackway, manager:

Water	2.85
Volatile	39.77
Fixed carbon	52.30
Ash	4.42
Sulphur	0.66

The Hespers Coal Company is opening this seam near the Ute mines; 7 feet of coal. Analysis of this coal as follows:

Water	3.74
Volatile	39.40
Fixed carbon	49.22
Ash	6.94
Sulphur	0.60

Following up the line of the Rio Grande Southern 20 miles further, or 35 miles from Durango in the Mancos valley, Mr. Brisco has a coal mine opened. Coal is about 4 feet thick, and of fair quality, and in the mountains some 800 feet above the Briscoe seam, Mr. Humiston has a mine opened. The coal is very hard, bright black in color. This seam is from 3 to $3\frac{1}{2}$ feet thick, no partings. An analysis shows: 62% fixed carbon, 5% ash; very low in sulphur.

This is one of the best coals examined as to quality, and will bear transportation equal to any in the field, but it being so hard it will cost more to mine it than other coals examined. Mr. Humiston informed me that 25 feet above this seam was another seam of coal 5 feet in thickness, with an inch parting two feet from top. From other information I am led to believe that all the other seams of coal in Durango field can be found in the mountains south of Mancos valley. No coal was examined beyond this valley, but I am credibly informed that the field extends 30 to 40 miles beyond.

Going down the Animas river from Durango, 50 miles to Farmington, the coal undoubtedly dips under the river, and does not show any outcrop until we come to the Ohio mines, some 12 miles below that town, on the San Juan river. At this place the upper measures are well exposed, and lying nearly horizontal. There appears to be two seams of coal of remarkable thickness and apparently of good quality.

A section of the upper seams shows as follows, commencing at top of seam as near as could be gotten at: Coal, could not get full thickness, slate $1\frac{1}{2}$ to 2 inches, coal 4 feet 8 inches, slate 2 inches, coal 3 feet, slate 1 to 3 inches, coal 1 foot 11 inches, slate 1 inch, coal 2 feet 8 inches.

Lying apparently 30 feet below this seam is another seam with a section as below: Coal and slate 12 to 15 inches, coal 1 foot 10 inches, slaty, slate 6 inches, coal 4 feet 4 inches, slate and coal 6 to 12 inches, coal 12 to 18 inches, slate 2 to 6 inches, coal 4 feet 3 inches, slate $\frac{1}{2}$ to 1 inch, coal 1 foot 6 inches.

The Porter coal seam of Durango should be found some 75 feet below this seam. The way this coal is dipping, it should be found at Farmington from 100 to 300 feet deep. The coal from both of these mines seems to be of very good quality, but could not get the analysis. It is black in color and mines in large blocks.

Starting from Farmington and following up the La Plata river, about 15 miles above Farmington, there are outcrops of several large seams of coal, but could not determine the thickness. Five miles further up the valley, one seam of coal is opened and dipping rapidly to the southeast. A section at this place shows as below: Coal 3 feet with 1-3 inch parting, coal 1 foot 4 inches, slate $\frac{1}{4}$ inch, coal 10 inches, slate $\frac{1}{4}$ inch, coal 1 foot 4 inches, slate 1 inch, coal 2 feet, slate $\frac{1}{4}$ inch, coal 6 feet, slate 1 inch, coal 4 feet with $\frac{1}{4}$ inch slate in places, slate 1 inch, coal, 4 feet 6 inches, $\frac{1}{4}$ inch slate in and out, slate 3 to 6 inches, coal 3 feet 6 inches.

This coal and all the other seams can undoubtedly be found under the entire La Plata valley. Following up this valley 15 to 20 miles further, are the Ute and Hesper mines, heretofore mentioned, on the Rio Grande Southern Railroad. The coal in the thick stratas of this very large seam is of very good quality and said to be coking coal.

From Farmington to Albuquerque, a distance of 200 miles, the entire distance is uninhabited, except three little settlements, but it is a very interesting country.

About 60 miles north of Albuquerque was a seam of coal some 6 feet in thickness. This coal is undoubtedly a lignite.

The writer only intended to speak of the coal so will not undertake to describe this wonderful country to any extent. The soil is unsurpassed for richness. Farmington at the junction of the Animas and San Juan rivers is 50 miles from the railroad, but they are raising apples, peaches pears that cannot be excelled, the two rivers furnishing abundant water for irrigation.

It was the home of the Aztec race and the ruins of their towns are seen on all sides. One old ruin must have had four hundred rooms. Some six or eight of these rooms were in good state of preservation; the structure was built with stone and may have been built a thousand years ago.

Following the reading of a paper entitled, "A Tramp's Visit to Southwestern Colorado and Northwestern New Mexico, with Durango as a Starting Point," prepared by Jacob G. Chamberlain, Los Angeles, Cal., and read by Mr. E. D. Haseltine, the appreciation of the same by the Institute was evinced by hearty applause.

SECRETARY HASELTINE: The older members of the Institute will recall Mr. Chamberlain as one of our most energetic members. He it was who first took up the idea of night schools and other educational advantages about the mines, and many young men in and about the mines owe their education to Mr. Chamberlain's energy and interest in that subject. He has every year since leaving here written encouraging letters, urging the work forward and hoping that some time he may be present at our meeting to renew old acquaintances and form new.

Moved that the Institute extend to Mr. Chamberlain a vote of thanks for his able and instructive paper.

MR. DOE: I wish to second the motion as a fellow member, acquaintance and friend of Mr. Chamberlain; and I wish to add to the motion that the Secretary be instructed to convey the vote of thanks to Mr. Chamberlain, with the greetings of the Institute. It has been said that "the noblest work of God is man," and I think in Mr. Chamberlain we have an example of God's work. I remember in regard to the very point the Sec-

retary brought out, concerning his earnest work in advocating education of the miners and other acts tending to their benefit and good; and I remember discussion regarding provision of libraries and halls of recreation and things of that nature around the mines, for which he was an advocate. His heart was in the right place.

DR. ORTON: I desire to second the original motion of Mr. Love and the supplement of Mr. Doe.

After further second of the motion and supplement by Mr. R. T. Weitzel, a vote was taken and same heartily and unanimously passed.

PRESIDENT RAY: We now come to four papers on the same subject. It has been suggested that the discussion of the same be left until all have been read, for it is likely that many questions which would be asked after the reading of one would be answered in another. If there is no objection to this plan, I will call one after the other until all have been read.

No objections being offered, the following paper was announced and read:

