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# CHAMBER OF COMMERCE.

*Pittsburgh, March 8th, 1880.*

In compliance with an invitation of the CHAMBER OF COMMERCE, GOVERNOR HENRY M. MATHEWS, of West Virginia, delivered the following address before the Chamber, on the Mineral Resources of West Virginia, and their relation to the industries of Pittsburgh:

The route of the Pittsburgh Southern Railroad I understand to be from Pittsburgh to Morgantown; thence, through Monongalia and Marion counties, to Grafton, in Taylor county; thence, up Tygart's Valley river, through Barbour and Randolph counties, to Valley Mountain; thence down to Greenbrier river, through Pocahontas, Greenbrier and Monroe counties, to New river; thence along the New river to some point near the lead mines in Wythe county, Virginia. No better route than this could, I think, be selected, both on account of the small cost of the construction and because of the valuable minerals and other resources which would be reached and made available to your city.

It is proper to say that the information which I will present has been derived from reliable persons, who have no pecuniary interest whatever in the country through which the road will pass, and that I am chiefly indebted for the greater portion of this information to Prof. Wm. M. Fontaine, of the University of Virginia, who has made a personal examination of the country and its resources, of which I will speak. I shall consider the subject of this road and the resources of this State solely as affecting the interests of the people of Pittsburgh. The terminus of the road should be at least as far East as the point which I have named. When the vicinity of the lead mines is reached, the road would be within a short distance of two lines of narrow gauge road which would connect it with the Virginia Midland Railroad, and the entire Eastern seaboard, and also with the Southern system of railroads. These narrow gauge roads are the Danville and New River Railroad, which is chartered to run from Danville, or some point between Danville and Pittsylvania C. H., through Martinsville, in Henry county, Va., Patrick C. H., Hillsville, in Carroll county, to some point on the Atlantic, Mississippi and Ohio Railroad, not east of Christiansburg, the Pittsylvania and Franklin narrow gauge, now completed, which leaves the Virginia Midland Railroad at "Narrow Gauge Junction," forty miles south of Lynchburg, and terminates at Rocky Mount, Franklin county. This road has been constructed to secure the magnetic ores of the counties of Pittsylvania and Franklin. It could be easily extended through Floyd county to meet the road from Pittsburgh, and this in addition to bringing your city into direct connection with the entire Atlantic and Southern seaboard, and opening to her an extensive market. Such an extension and connection of the roads would give her access, as will appear hereafter, to the purest of iron ores.

To point out the resources which may be opened up by the Pittsburgh Southern Railroad, it will be well to follow the route, and to call attention to the character of the country through which it traverses.

From the Pennsylvania line to Morgantown the road would pass in the lower barren measures, which contain in this region several well developed deposits of good iron ore, of the usual coal measure character, which, in the early history of iron manufacture, supported several furnaces. The coals of the upper productive

measures are all in the hills above water level, and reach an aggregate development unequalled elsewhere. They are the Pittsburgh bed, averaging from eight to ten feet; the Redstone, of from about three and a half to four feet; the Sewickley, of from five to six feet, and the Waynesburg, of from seven to nine feet. There is reason to believe that some of these coals may prove to be excellent coking coals. From Morgantown to Grafton, and thence to the vicinity of Beverly, in Randolph county, the general conditions as to coal and iron are much the same, except that the lower barren measures are now chiefly in the hills, and the lower productive measures are those which yield most of the coal, which is neither so abundant nor so good as that of the upper productive measures along the Monongahela. From Beverly eastward we enter a region where the timber, which is varied in kind and great in quantity, has scarcely been touched. This belt of country, lying along the western side of the east front ridge of the Allegheny and its continuations to the south, extending, with varying width, through Tucker, Randolph, Pocahontas, and the northern portion of Greenbrier, has in the valleys and lower hills a mingled growth of white oak and other oaks, wild cherry, poplar, walnut, and other valuable timber. Nowhere else do the walnut and cherry trees attain such dimensions. The higher hills, and especially the mountains, have an enormous growth of hemlock, spruce, various kinds of pine, and notably the black spruce or yew pine, as it is there called, (botanically the *abics nigra*.) This latter tree is greatly developed in the region near where the road would cross the divide with the Greenbrier valley. Large areas would here yield twenty thousand feet per acre. This tree has all the good qualities of the yellow pine, and is superior in straightness of grain and freedom from resinous matter. It cannot fail to become a valuable accession to the marketable lumber of the country, although it is now almost unknown. The road would run near to a large body of white pine—the country along the upper waters of the Greenbrier yielding several hundred millions of feet of this timber.

All of the lands from Morgantown to Beverly and beyond, are well suited for grazing, and produce blue grass as soon as the timber dies, and a large portion of this country is highly productive and well adapted to all farming purposes. It requires only a stimulus of a market to increase greatly the general products. In much of this region no attempt is now made to raise more grain than is sufficient for home consumption.

At the headwaters of the Tygart's Valley river and the vicinity of the divide which separates that stream from Greenbrier river, we find ourselves in geologically older rocks—the carboniferous conglomerates and the underlying red shales of the umbral, and also the lower carboniferous limestones and shales, and the vespertine or lower carboniferous sandstones and shales. These rocks extend for some distance down the valley towards Beverly. Deposits of iron occur here not differing essentially from those of the higher portions of the coal measures, and similar to those found at the same geological horizon in Pennsylvania. When we cross the divide into the valley of the Greenbrier, we find ourselves in the rich grain and farming lands of the lower carboniferous limestone and the accompanying shales. These extend along the river through Greenbrier and Monroe to New river.

Following the Greenbrier river, the road would cross, near the White Sulphur Springs, the Chesapeake and Ohio Railway. The mountains are covered with enormous quantities of white oak and other hard woods, and would furnish an almost inexhaustible quantity of material for cross-ties and other uses, while

along the foot of "the great Flat Top," we find outcropping the most easterly extension of the excellent coking coal used at Quinnimont and other points on New river. These coals belong to the conglomerate series, and they are almost always pure and good coking coals. The coal coked at Quinnimont is said to make a coke equal, if not superior, to the best Connellsville coke. A narrow gauge road from the mouth of Greenbrier, along the foot of the great Flat Top, would utilize all the timber of that untouched region, and cause the construction of coke ovens to furnish fuel to the great mineral section which lies further south along New river, and which in the near future will become the seat of a great mining and manufacturing industry.

Along the Greenbrier river and Beaver creek, one of its tributaries, in Pocahontas county, and on Anthony's creek, another of its tributaries, in Greenbrier county, and very near the line of the proposed railroad, are immense deposits of iron ore. I am informed that in these localities are found the brown hematite, the fossil and block ores. The outcrop of the brown hematite is very large, and while the thickness of the vein is not definitely known, it is said to range from twelve to one hundred feet. The deposit of block ore is reported to be seven feet thick, and the deposit of fossil ore about forty inches. These ores extend over a very large area. From the mouth of the Greenbrier to Peter's Mountain, on the eastern edge of Monroe county, the road would pass through the same limestones and shales that were found along the Greenbrier. In Peter's Mountain the Allegheny system of rocks would be entered, and from that point to the southwest corner of Montgomery county, the various ranges of mountains are composed of these rocks, ranging from the base of the upper Silurian to the Vespertine or lower carboniferous. Two principal iron ore horizons occur in these rocks, which furnish an abundance of material. The lower horizon is composed of the Clinton fossiliferous ore, and the upper is of the ore deposit at the base of the Oriskany sandstone. Both of these deposits extend throughout the length of the Alleghannies, and their character has been fully tested. It is probable that they contain too much phosphorus and sulphur to be used successfully in the manufacture of steel by the Bessemer process. Price's Mountain, two miles west of Christiansburg, and Brushy Mountain, three miles further west, contain a considerable quantity of a semi-anthracite coal of excellent quality. This coal is found in two workable beds, which would yield several million of tons of fuel, which could be used in the raw state for smelting iron. The per cent. of bituminous matter of this coal is ten and less. This coal resembles in appearance the carbonite or natural coke of the Richmond coal fields. This small coal field gives the nearest approximation to a true anthracite to be found outside of Pennsylvania. In this vicinity the road would cross the Atlantic, Mississippi and Ohio Railroad, and thence to the lead mines in Wythe county. The country is mainly lower Silurian rocks, consisting in large part of the lower Silurian limestone.

Poplar Camp Mountains and their southerly continuation—the Iron Mountains—running on the east side of Pulaski and Wythe counties, containing the Potsdam sandstones, and along their western foot show immense deposits of the pure brown hematites contained in the slates and shales which overlie these sandstones. These ores are everywhere noticed for their freedom from sulphur and phosphorus and for their yield of a neutral iron. This is the same ore which is worked at various points farther north, on the east side of the Valley of the Virginia, and on the Lehigh river in Pennsylvania. On the New river these ores reach an exceptional development, both in quantity and value, and Pittsburgh

could here supply herself for an indefinite period with these most desirable ores. Prof. Wm. B. Rogers, forty years ago, was so much impressed with the amount and fine character of these ores, that he then stated that this locality was destined to become the great center of the iron manufacture of the country—a prediction which, I trust, is about to be fulfilled by means of Pittsburgh capital and energy, and with the best results to her prosperous and energetic citizens. Portions of these ores farther north in Virginia, carry manganese, and the slates which carry the hematites in the central portion of the State, contain fine deposits of pure manganese. There is little doubt that similar deposits exist in the southwest, for the geological character of these rocks is very constant.

If this is so, then spiegle iron could be manufactured under the most favorable circumstances. This region, it seems to me, should be the true objective point of the Pittsburgh Southern Railroad. And if connection should be made with either of the narrow gauge roads which I have already mentioned, Pittsburgh could procure readily the magnetic and specular ores of Franklin, Pittsylvania, Patrick and Henry counties, Virginia, which are so well and favorably known for their purity and the excellence of the iron which they yield. The magnetic ores of Franklin long supported a number of charcoal furnaces. The Pittsylvania and Franklin narrow gauge road was built especially to reach these ores, and for more than a year magnetic ores have been shipped from the north-west corner of Pittsylvania, on Pig river, via the Virginia Midland Railroad, all the way to the vicinity of Harrisburg, Pa., to be used there for the manufacture of Bessemer steel. The geology of the counties of Floyd, Carroll and Grayson is not positively known. These counties form a plateau whose eastern escarpment is called the "Allegheny Mountain," and whose western escarpment forms the "Poplar Camp Mountains" and the "Iron Mountains."

I suggest that capital might be profitably employed here in a new industry. With the sulphuric acid made from the copper ores and pyrites of this region, the coke from the localities named, and the salt deposits found at Saltville, on the Atlantic, Mississippi and Ohio Railroad, the manufacture of soda ash could be prosecuted most profitably. This same substance, which is now imported, could also be made with profit, on the Chesapeake and Ohio Railway, from the salt deposits of the Kanawha Valley and the other material which are all found on the line of that road.

In addition to the connection which I have suggested, there are others not less important. A road will soon be constructed from a point on the Baltimore and Ohio Railroad to reach and develop the vast deposits of valuable iron ore in the counties of Hampshire and Hardy. Arrangements have, within the past week, been completed for the immediate construction of the Allegheny Railroad, from Clifton Forge, on the C. O. Railway, along the James river, and through the iron deposits of that region to Richmond. A road is now under construction from Hinton, in Summers county, along the New river, through the counties of Mercer and Giles, and which will pass through almost inexhaustible deposits of the most desirable ores. Thus the Pittsburgh Southern Railroad will render all of these resources available to Pittsburgh.

I think that we may safely say that there cannot be undertaken any other enterprise of greater importance to Pittsburgh. No other railroad of the same length can be constructed at so small a cost, which will open up so vast an extent of country, abounding in undeveloped wealth, and confer such great and permanent benefits upon this city.

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