

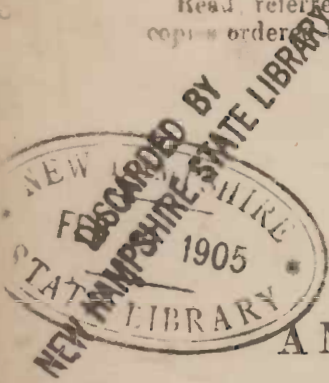
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BY THE HOUSE OF DELEGATES,
FEBRUARY 5th, 1880.

Read, referred to the Committee on Inspections, and 1,000
copies ordered to be printed.

By order,

MILTON Y. KIDD,
Chief Clerk.



SECOND

ANNUAL REPORT

OWEN RIORDAN,
INSPECTOR OF MINES,

FOR

Allegany and Garrett Counties,

For Year Ending December 31st, 1879,

ANNAPOLIS:

WILLIAM T. IGLEHART & Co., STATE PRINTERS.

1880.

Maryland State Library

ANNUAL REPORT

WESTERNPORT, MD., Dec 31st, 1879.

To his Excellency,

William T. Hamilton, Governor of Maryland.

Sir:—In compliance with the requirements of law, I have the honor to submit herewith my Second Annual Report as Inspector of Mines, for the Counties of Allegany and Garrett, in the State of Maryland, containing a description of the condition and operation of the coal mines examined during the year, and such other matters and information as I have deemed of importance.

As this Report traces coal and its importance to any country, it is right to give an explanation of what it is, and of its origin. The rocks of the earth, known as the "Coal Measures," consist of a series of beds of sandstone, shales, limestones, fire-lays, iron-ores, and coals in manifold alterations.

The beds of coal are now universally held by men of science to have been formed from the decomposition of vegetable matter—the leaves and stems of ancient plants and trees which grew and died, and became decomposed and mineralized on the spot where the coal is now found.

Another writer says: "Coal is not a mechanical mixture or formation, nor is it a chemical compound. Unlike limestone, granite, sandstone, or other rocks, and unlike all the other productions of the earth, except peat and lignite, which are of the same class, coal is the production of vegetable matter, which grew upon the place where it is now found; and the process by which it was converted from woody matter into coal, is mainly accounted for by two causes, moisture and pressure. There seems to be no reasonable doubt that it is the production of vegetation, and that of a very wonderful vegetation."

Cold and dull, indeed, must be the intellect which has no curiosity to see or learn something of the gigantic trees and plants of the ancient world, and of which the fossil are found among coal.

Before the discovery of America, it is said, there were sometimes found on the Coast of Europe strange looking trees and reeds of immense size, which had been drifted ashore by westerly winds. With what interest must those waifs from an unknown land have been received by the Philosophers of that period! If, when some deserted ancient city, like those of Central America, was discovered, objects of nature and art were found of a vastly greater size than those of our day, what interest they would excite, not only from their dimensions, but from their antiquity. With some such feelings, you can see, in any coal mine, wonders of nature more remarkable than those supposed, and of much greater antiquity.

Here are found layers of slate and sandstone rock, both above and below the coal, often separating it into two or more seams, in which you will discover the impression of the leaves and stems of land plants, and of the trunks of large trees, of the kind not now found on the earth, made on the rocks when they were soft clay, sand or mud, and these impressions are in a very perfect and plain form, being complete copies of plants in all their minute details, sometimes showing even the small veins on the leaves. As you pass along one of these underground galleries, you can see in the roof or rocks overhead, an extraordinary collection of vast quantities of the prostrated and flattened trunks of trees of great size and length, and unknown species, presenting so little variation in their thickness for long distances, as to give us an idea of their wonderful size and height, when standing erect, for plants of that description.

It must be regarded, too, as a very singular circumstance, that each seam of coal appears to have originated from a distinct vegetation, and miners and geologists find important indications for the identification of the several beds of coal in the preponderance of the impression or fossil of certain plants peculiar to the seam, and found in the black slate, immediately over the coal.

So, in our day, a new species of forest trees always grow up where a former growth had been cut down--the supply of germs of the old species being exhausted. This coal vegetation was of a description, compared with which, anything in our day of the same class of vegetation, in respect to its size and quantity, fades into insignificance.

The exuberant growth of vegetation in our tropical climates is astonishing to us, yet that is but as the grass of the field, as compared with that of the coal era. For example, equisetal, or horse-tail flags, are never more than half an inch in diameter, while in coal-rocks gigantic reeds of this kind are found as much as fourteen inches in diameter.

Living club-mosses, even in our tropics, attain no great height, while in the coal formation they are as thick as a man's body, and 60 or 70 feet high.

Then there are quantities of *Sigillaria*, those beautiful fossils, the impression on the bark of which, reminds us of the work of the sculptor, containing on their surface, impressions as distinct, regular and beautiful, as if made by a seal upon wax, by the hand of man, and hence their name.

The theory that coal was formed by the drifting of large masses of timbers into bays, after the manner of the Red river rafts, now finds no advocates.

The material could not have been furnished in sufficient quantity, and disposed in layers of equal thickness, extending for many miles, and so free from mud, sand, or other impurities or foreign substance.

Coal of the carboniferous age, when examined, is apparently never found to be formed of the trunks and large branches of trees. The opinion now held by geologists is, that the vegetation from which coal of the carboniferous age originated, was similar to that of the peat bogs now found in nearly all parts of the world. The following excellent summary of the whole argument as to the origin of coal is, by Prof. Lesquereux, whose writings are found in the State Geological Reports of Pennsylvania, Kentucky, Arkansas, Illinois, and in Dr. Hayden's Reports on the Territories, from which extracts have already been given, have exhausted the subject.

The formation of coal is now pretty well understood among geologists. It results from active growth of woody plants, whose *debris* falling every year, are preserved against decomposition by stagnant water, or great atmospheric humidity.

It is the process which now still forms our deposits of peat. It demands for its favorable action a ground or basin, rendered impermeable by a substratum of clay, a peculiar kind of plants, constantly growing at the same place, and heaping their *debris* for a length of time. At our epoch the formation of peat is essentially of two kinds. Either the

vegetable, which furnish the material, are aquatic, or semi-aerial plants, having their roots in water, and expanding their branches, leaves, &c., on the surface of the water, or above it. Their *debris* fall in water and are heaped and preserved under it. In another way, and this is more generally the case, the plants of the peat bogs are a peculiar texture. Hygrometrical, like sponges, they absorb humidity by their aerial tissues as much as by their roots, and thus protected themselves against decomposition from atmospheric action, they cover in their growth every kind of woody *debris*, even large trees, and afford to them the same protective influence. Several other theories have been advanced, accounting for the origin of coal. *Blakely*, and other eminent geologists, held that the carbonaceous matter was an accumulating of vegetable *debris*, which had been drifted by rivers into bays and estuaries.

Sir Wm. Logan, in 1840, during a survey of the South Wales coal field, has confirmed the theory that the vegetation grew on the spot where the coal is now buried.

Many geologist writers maintain, that during the carboniferous era, the atmosphere of the earth was intensely hot, and was also saturated with vapor, and charged with undue proportions of carbonic acid gas, which had been liberated from the interior of the earth through the agency of volcanic eruptions; these conditions being claimed as essential to the production of the coal vegetation. Beroldingen first suggested the theory that the coal beds of the present age were the peat bogs of the primeval ages, converted from peat into brown coal, and then into true coal; and this view is now accepted by every intelligent geologist.

"Coal," says Dr. Newberry, "is entitled to be considered as the main spring of civilization. By the power developed in its combustion, all the wheels of industry are kept in motion. Commerce is carried with rapidity and certainty over all portions of the earth's surface; the useful metals are brought from the deep caves in which they have hidden themselves, and are purified and worked to serve the purpose of man."

By coal, night is, in one sense, converted into day, winter into summer, and the life of man, measured by its fruits, greatly prolonged, wealth with all its comforts, the luxuries and triumphs it brings, is its gifts. Though black, sooty, and often repulsive in its aspects, it is the embodiment of a power more potent than any other thing. The highest material boon that can be craved by a community or nation. The first time coal is expressly mentioned in the works of

ancient authors, occurs in the writings of Theophrastus, the pupil of Aristotle, who lived nearly three hundred years before Christ. In his book on stones, chapter 28, this author remarks: "Those substances that are called coals, and are broken for use, are earthy; they kindle, however, and burn like wood coals." Pliny also speaks of a black substance, as available for medicinal and ornamental purposes. Coal is mentioned for the first time in English history, in the year 1180, when the Bishop of Durham granted some lands to a miner to mine coal for the use of a blacksmith, at Coundeu, in the County of Durham. In the year 1189 the Earl of Winchester made a grant to the Monks of the Abby of Newbattle to work coal.

Henry III., in 1239, granted a charter to the people of New-Castle-on-Tyne, conferring upon them the privilege of mining coal, and in 1240, coal appears to have been shipped to London.

Coal was mined in Scotland during the twelfth century. And in Ireland in the eleventh century. We have authentic accounts that coal was mined and used during the reign of Edward I.

Until the seventeenth century, coal was mainly used for household purposes, and in blacksmith forges, and by brewers, dyers and other artificers who required a strong fire. It was not till the discovery of steam, and its practical application to industrial purposes, that the coal trade began to assume real importance. Then came the manufacture of gas from coal, and the discovery of the hot blast in the smelting of iron; and finally, the steamboat and railroad locomotives, which made the use of coal an indispensable article of modern civilization, and almost as important an element as water.

The working of coal in Belgium, is traced back to the twelfth century, at which time we have authentic accounts of mining operations at Pienevaux, near Liege, and not long afterward, we learn of the mines of Charleroi being worked. Coal was used in the manufacture of arms in this country from very early times; some historians asserting, even before the invasion of the Romans under Caesar. We have no certified account of mining in France till the fourteenth century. The first discovery of coal in America was made by a Catholic Priest, Father Menepin, in the year 1669, in what is now the State of Illinois. His journal, published in 1693, containing a map illustrating his travels, and he points out a coal mine on the Illinois river, where a bed of coal was exposed to view along the banks of that stream. The Rich-

mond coal field of Virginia was first developed in 1750.— In 1775, and during the progress of the war of independence, the coal from the mines near Richmond, was used in the manufacture of shot and shell for the American army.

In 1684, privileges were granted by William Penn to mine coal in the hills fronting the river at Pittsburg. The existence of the Anthracite deposits of Pennsylvania was known as early as 1766, in which year a specimen of the coal of the Wyoming region was shipped to England. The coal of the Lehigh region was discovered in the year 1791. In 1808 the Lehigh Coal Mine Company shipped to Philadelphia a specimen of said coal. In 1812 Col. Shoemaker, of Pottsville, shipped nine loads of said coal to Philadelphia. The Schuylkill region was partially opened in 1822, and in 1825 coal boats were sent from Pottsville to Philadelphia.

In 1830 improvements were so far completed that coal was shipped without much trouble. The Midland Coal Field, of the Shamokin region, came later into market, and it was not until the year 1839 that shipments were made.

The coal of Maryland commenced in 1842: the shipments for that year were 2,674,101 tons.

It can be readily seen, from the progress made in the trade, that coal is the best branch of industry in any country where it is. There is more money invested, and more able-bodied men working at it, than in any work in the country. Coal-digging is like education; no man ever acquired thorough knowledge of it; neither can any man learn the art of mining. There are so many unforeseen accidents connected with it that always make it dangerous.

The bravest men in any country ~~are not afraid of digging.~~— None but a brave man would undertake such a perilous life; long hours, hard work, bad air and fire to contend with.— They are as generous as they are brave. There is scarcely a month in the year that they do not contribute to the support of some widow or orphan, and some months as much as three collections are taken up to support charitable institutions or purposes. At the time of the war between the States, they were the first to spring to arms to support and defend that which they thought was right, some taking one side and some the other, as their consciences dictated.

The miners of Great Britain were for many generations, in a low and degraded condition. In 1606 a law was passed in Parliament, declaring that all miners who would leave their masters, (not employers,) without their consent, were

to be deemed as thieves; and in the same Act, power was given to the owners of the mine to arrest them and bring them back to work in the mine again. In 1661, during the reign of Charles II., another Act of Parliament was passed, referring to the coal miners of England. The said Act fixed their wages, as also the working hours of the miners, and as not working constantly was "a great offence to God," and to the "prejudice of the master," the miners were compelled to work the six days of the week, and in refusing to do so they were badly punished.

Until the year 1775 the miners of Scotland were kept in slavery, being compelled to work for life for the owner of the mine, and when the coal mine was sold or changed hands in any manner, the miners were also sold, or changed with it.

Although the Act of Manumission was passed in the same year, it was not until 1799 that many of the miners were liberated. This slavery was the doing of the Scotch people themselves. It was an Act of the Scottish Parliament, and a decision of their Court of Claims.

The runaway negro slave who had taken refuge in British soil, would be protected against his master, but the Scotch miner could not change his occupation, or even leave one mine and go to work in another. Hence it was that the English Government had more regard for a runaway negro than they had for their own coal diggers. With all their boasted freedom, they were the last government in Europe to extend protection to their under-ground workmen.

Napoleon I, in the year 1811, established in Belgium, France, and in the German Provinces of the Rhine, the present system of inspection, with such additional improvements as time and experience since have shown to be necessary. France, under Napoleon, France, under constitutional government, Germany, Spain and Belgium, under despotic governments, have always been watchful of their under-ground workmen, always protecting them from the many dangers of working in the mine. The first movement towards the protection of the miners in Great Britain, commenced in 1812, in consequence of the dreadful accident of the Felling Colliery, by which nearly the whole population of the mine were destroyed by an explosion of fire damp. It was not, however, until the year 1842, "thirty years after, that a bill was introduced into Parliament for the protection of the miners, and it was again defeated."

In 1850, a bill was again read and passed in Parliament, providing for the appointment of two Government Inspectors, and limiting the ventilation to five years.

In the year 1855, the five years having expired, it was, on recommendation of a Parliamentary Committee, extended five more years, and there were added to it some effective sanitary provisions. The powers of the inspectors were also enlarged, and their number increased from two to six.

In 1872, the crowning Act of British mining legislation, embracing every reasonable demand of the mining population, was, after twenty years of agitation, secured.

In 1858, a bill was introduced in the Legislature of Pennsylvania, asking for a Ventilation law for the mines of Schuylkill county. The bill was opposed by the Coal Companies and defeated.

It was again introduced in 1866, and passed the lower; but was defeated in the Senate.

In 1869, it became a law. The said law was enacted for the anthracite region alone, which was divided into six divisions, with a Mine Inspector for each one. Since then, experience proved that it was necessary to extend the law to the bituminous coal region, and the Legislature has done so.

In the year 1870, the State of Illinois adopted a new Constitution, which contains a provision, requiring the passage by the Legislature of such laws as will secure double outlets, safe means of ingress and egress, and a healthy ventilation in all coal mines of the State, and the Legislature at once passed a law, providing for the protection of the miners, and making the County Surveyor of each county the Mine Inspector, charged with the duty of enforcing the law.

The mine owners and the miners alike, asked for the repeal of that portion of the Act, quoting as a reason, that the Mine Inspector ought to be an expert, not a theorist, and therefore their demands were granted.

In the Ohio Legislature, in 1872, a bill regulating coal mines and their working was introduced, which divided the State into two districts, and for the appointment of two inspectors. This bill was opposed by the Coal Companies, and it was defeated.

At the same time, a resolution was introduced and passed, authorizing the Governor to appoint a commission, composed of three members—one of them a practical miner, to

make an examination of the leading coal mines of the State, as to ventilation, means of ingress and egress, and things pertaining to the protection of the miners. This commission was on duty four months, and made two reports—the majority recommended the appointing of a commission in every county in the State, to be composed of four members each, namely, the Sheriff, County Surveyor and Physicians.

The miner made a minority report, recommending the enactment of a special law for the regulation of its operations, and the employment of a well-informed, practical inspector, to pay frequent visits to the mines, to see that the law was properly enforced and obeyed. At the meeting of the Legislature, a bill was introduced, based on the minority report, which passed the Senate, but in the House that portion of it that referred to the appointment of the inspector was stricken out, and in this shape it became a law. Governor Noyes, in his next annual message to the Legislature, called attention to this imperfection of the law, and recommended the appointment of an Inspector of the Mines, otherwise the law would be no good. The Session of 1874, passed the present law, authorizing the appointment of one State Mine Inspector, who shall devote all his time to see that the law must be enforced and obeyed.

In the year 1876, Hon. Thomas Hendricks, of Indiana, made a speech before a Democratic Nominating Convention, and urged the Members of the Legislature to pass a Ventilation law, and appoint an Inspector. Such a law, said he, would encourage emigration, and help to develop the resources of our State. On the assembling of the next Legislature, the bill was introduced, and without a dissenting voice, it be-

In the year 1879, the Legislature of West Virginia, passed a Ventilation law, and appointed an inspector.

The Legislature of the State of Maryland, in 1876, passed a Ventilation law, and appointed a Mine Inspector. Under the law, the power of the inspector was too much circumscribed, and the good effects expected was not fully realized. In 1878, the Legislature amended the law, so as to secure the rights and privileges of the miner more effectually, also, it forced all the Companies into a more equitable and juster basis to one another. The great rattling center of the law of 1878 is, that each miner must be paid for all the coal he puts on his car—thus bringing each company down to the relative cost of mining, and protected the Companies from the encroachment of one against the other. It broke

up the system which some Companies practiced, of causing the miner to dig and load much more coal than he was paid for. These Companies, by this practice, were enabled to undersell the honest ones, and demoralize the coal trade of this region generally. There is circumstantial evidence enough to satisfy me that there are some of the Companies not doing full justice to the weight, and there is not power enough given to the inspector to prevent it. The Consolidation Company is doing business above suspicion, her weighmasters use all paper, and therefore there is no chance for changing any of the figures. The Maryland, the American, Atlantic and other Companies, cause their weighmasters to keep a book and copy the weight into it each day, and also into the monthly report, which sec. 12 compels them to keep. The said book is sent into the Company's clerk the last of every month—from it the pay-roll is made—the pay roll, the book and the monthly report are equal and just. I do request that the Legislature make that a law for all the Companies to observe, and that will make things satisfactory.

I respectfully call attention to sec. 10, of the Acts of 1878, which requires operators of mines to furnish a sufficient quantity of timber *at the place* where the miner is *at work*. The section is unaltered from the law of 1876. My predecessor in office brought suit against one of the Companies for not complying with the requirement above stated. The Allegany County Circuit Court decided against the State, to the following effect: That the Ventilation law was made to protect the life and limbs of the miner, and not to save him any labor, and that the carrying of the timbers from wherever laid, and the loading them on the Company's cars, were questions of labor over which the Legislature had no power. Sec. 5 should be amended, or a Coroner appointed in the mining district, as no Justice of the Peace is compelled by law to act as Coroner.

I respectfully call particular attention to section 15 $\frac{1}{2}$, which gives a special privilege to mines worked by a shaft. According to this amendatory section, the Company, taking out their coal by a shaft, is privileged to contract with the miners to receive pay according to measurements.

I have carefully observed this part of the law, and am constrained to report unfavorably of it. The mine cars, at the Borden Shaft, is marked 79 cubic feet.

According to a report made by Prof. Johnson, to the Navy Department, a box of that cubical contents will not hold two tons of coal, by two or three cubic feet. The difference must be

put on the top of the cars. No miner can tell when he has that much on the car; and in order to be sure of putting two tons on the car, he must, in all cases, put on more. That much more than two tons on the cars, is an advantage that no other Company has.

The Legislature have no power over the measurements of the cars at the Borden Pit, and said to said Company, do as you please, and to the others, do as we please, which is a discrimination in favor of that Company, and an injustice to all the others.

It would work no hardship to any Company taking out coal by a shaft, as it is just as practicable and no more expense to have a weighing scale at the bottom of the shaft, as it is at the head of the plane in other mines. The man that would hitch on at the bottom of the shaft could weigh the coal, and, therefore, there would be no more daily expense connected with than there is at present, where the scales are placed at the head of planes, at other mines.

For these reasons, and in justice to all concerned, I earnestly urge the repeal of this section giving such special privileges.

That portion of the law which treats of ventilation and air supply, is admirable, works well, and needs no alteration.

The Inspector, by means of his anemometer, can always ascertain whether the miners at work are supplied with a sufficient amount of good air, and if insufficient, the remedy is easy, and the power to enforce it ample.

In my last Annual Report, I gave the amount of air that was going into each mine, for each man, which was the result of my inspection into that matter.

Further investigation developed the fact that some mines, having abundance of fresh air entering them, had some portions in the workings very badly supplied; so badly, indeed, that when I penetrated into these workings, my light was extinguished, although there was a supply of one hundred cubic feet of air per man, going into the mine at that time. I gave orders that it should be remedied at once; which order was obeyed.

Next to the equalizing of weights for all the mines, the enforcing the ventilation regulations has proved a great blessing to men and Companies.

In the foregoing pages of this report, I have shown, that in Europe, the greatest care has been taken to preserve and protect the Ventilation law.

In France, with her civil wars and different governments, that each party as they came into power took the greatest care possible to foster and defend the Ventilation law:

In Germany, at present, her miners are the best protected of her citizens. Wherever this law had been established, there is no recorded instance of its being ever abolished.

In Belgium, Germany, and in England, also in the States of Pennsylvania, Ohio, and Illinois, has this law been tried to work without a Mine Inspector, and in all places has it failed. In many of these places there was appointed, to enforce this law, Sheriffs of the counties, Judges of the Courts, commissions, arbitrators, doctors, &c., and in all places it proved a failure. Ventilation law cannot be enforced without an Inspector; they are inseparable, and the one is no account without the other.

The Knootz Mine and Borden Shaft, at the time that I measured them, had only 34 and 36 cubic feet per man per minute, going into them, and the men were supplied with enough of air at the time. The reason is, the Knootz Mine is, comparably speaking, a new one, and the distance is short from where the air enters the mine until it reaches the furnace, and has not as much gas to retard its speed as if it had a long distance to travel.

It is evident that the volume of air increases as the airway is shortened, in proportion to the square root of the extent of the rubbing surface, or in other words, a given quantity of air passing through a mine, a distance of two miles, will encounter more friction and gas than the same quantity would by passing only half a mile, and would cause the air to be hotter and ~~more~~ good to the men than where it traveled the long course.

Andrew Roy, State Mine Inspector of Ohio, in giving testimony in the case of the ~~death~~ of John Jones, and others, who were killed in the Brookfield Slope, July 13th, 1877, said, he measured the air and found it to be 3,000 cubic feet, and they opened one door and the same volume of air registered 15,000 feet. The reason, he said, why the current of air increased from 3,000 to 15,000 cubic feet per minute by the opening of a single door, was owing to the shorter route the air traveled; the current, instead of passing around the mine, moved straight from one shaft to the other. If, where the air entered the mine, and where it went out, had been within two hundred yards of each other, instead of about half a mile, the same ventilating pressure would have moved thirty thousand cubic feet of air instead of fifteen.

The Judge on the Bench, who had never been in a coal mine in his life, understood that air is retarded by the frictional resistance it encounters in passing through the airways in mines, or through airways of any other substance. We have one or two men in Allegany county, who claim to be miners from boyhood, who do not understand how that could be.

As to the Borden Shaft, they had a furnace that had not capacity enough to draw out all the damp that the mine was making; the Company built a larger furnace that now does the work admirably. The Consolidation Company has good furnaces and good air, and does business every way above suspicion.

We had a strike in our coal mines; it commenced on the first day of September last, and continued about 35 days. There were at one time 2,000 miners who stopped work—which would be equal to 70,000 men for one day—each man averaging 3 tons of coal per day, which would make 210,000 tons, at 40 cents per ton, for digging, which would amount to \$84,000. Taking into consideration the loss to the canal and railroads transporting this amount of coal, and also the large sum of money that otherwise would be in circulation in our midst, we must consider the strike a terrible calamity, and ought to be avoided hereafter.

In the spring of 1878, several of the Companies notified their miners to meet them in Cumberland at a given day; the miners, through their delegates, met them; the representatives of the Companies explained to them the selling price of coal, the depressed state of the trade, and the competition they had to contend with from other places, and they could not pay them 55 cents per ton any longer, but would give them 40 cents per ton and just weight.

The miners seeing the state things were in, accepted the offer, and work went on as before. That was putting what is known as the sliding scale into practice. Things went on all right until the middle of last August, when the miners thought the state of the trade and the condition of the country justified them in having 10 cents per ton, advance, for digging, and to put their side of the sliding scale into operation; they published a piece in the papers making said demand, and requesting an answer by the first of September. The time arrived and with it no answer; the miners stopped work, and the result was, as I have above stated, only the matter was worse; to keep 2,000 miners at work, it requires drivers, dumpmen, carpenters and blacksmiths, who were

all made idle, which made the loss more than I estimated. I have no doubt, if the Companies had responded to the call made on them, the matter would have been satisfactorily adjusted and a strike obviated. To settle these difficulties in future, I would advise both parties to observe the sliding scale system in time; if they do it will settle things amicably. The sliding scale is like the thermometer; the different seasons causes the magnet to go up and down; so it is with wages; times and circumstances cause it to raise and fall, and only to parties being interested in it, namely, the employer and employed; and if each one of them respects the rights of the other, there will be no trouble. I am satisfied if the Companies give their Superintendent at the mine power to settle all difficulties, they can do so much better than their respective Companies can. The large majority of the Superintendents are intelligent men; men of good knowledge, who know how to deal with the miner much better than their Companies do.

The American Coal Company has completed a new incline plane inside their mine, which has a carrying capacity of ten tons a trip; its course is South 33°, East, and about 2,000 feet long, which is a saving to the Company.

There is a new railroad constructing into our coal region, called the George's Creek and Cumberland Railroad. It connects us with New York, and all other eastern markets, also with the Chesapeake and Ohio Canal, and Baltimore and Ohio Railroad, at Cumberland.

All we want is cheap transportation to market; we have the coal in abundance, both large and small veins, with little or no difference in the quality.

When the Baltimore and Ohio Railroad first came to Cumberland, the coal for its use was hauled in wagons from the Frostburg Mine, (big run,) and from Mt. Savage, a small vein that was then opened on the lands of Jonathan Arnold, now the property of our present State Senator, Hon. John S. Combs. At that time there was no difference in the qualities, both alike answering the same purpose, and no questions asked as to where any of the coal came from. But after the railroad from Frostburg to Cumberland was completed, the small vein coal could not be mined as cheap as the big vein, and therefore it was compelled to stop. In the year 1877, I was in Baltimore, and in conversation with a prominent coal operator, remarked to him, that a certain Company was shipping one hundred and fifty tons of small vein coal daily; he answered, that when the

people would find out where that coal came from, it would be condemned. It grieved me to think that men of our day would be so much under the influence of imagination, as to think that the coal served their purposes so long as they did not know where it came from; then, knowing where it came from, it would no longer suit them. This opposition to the small vein coal, reminded me of the objections raised against coal generally in England in ancient times. History proves, that during the reign of Edward, I., coal was banished from the City of London as an intolerable nuisance. And that in the year 1661, more than 350 years afterwards, a memorial was sent to the Crown by Sir Kenelm Digby, protesting against the use of coal, of which the following is an extract:

"This coal flies abroad, fouling the clothes that are exposed adrying on the hedges, and in the spring time bespoils all the leaves, so that there is nothing free from its contaminations; and it is this that the bleachers of Harlem prohibit, by an express law, the use of coals for seven miles about town. Being thus incorporated with the very air which assists to the necessary respirations of our lungs, the inhabitants of London, and such as frequent it, find it in all their expectorations; the spittle and other excrements which proceed from them, being for the most part of a blackish and fuliginous color, besides, the acrimonious soot produces another sad effect, by rendering the people obnoxious to inflammation, and comes in time to excruciate the lungs, when a disease is produced, so incurable, that it carries away multitudes by languishing and deep consumption, as the bills of mortality do quickly show."

In Stowe's Annals, by Holmes, published in 1632, it is stated therein, that the ladies of London would not come into any house or room where coal was burned, nor willingly eat of food which was cooked by a coal fire.

In 1803, Lehigh Coal Company shipped some coal to Philadelphia; after much difficulty it was disposed of to the city authorities to be used as for an engine. But the coal could not be made to burn, it was pronounced to be "black rocks," and was broken up and put on the streets as ballast.

In 1812, Colonel Shoemaker, of Pottsville, sent some coal to Philadelphia, assuring all the coal was good, and in use in the mountain regions; one firm purchased one load at the cost of hauling; it was again tried and could not be made to burn, and the Colonel was denounced as a scoundrel.

I quoted these facts to show how little judgment or sense the people of those days had about coal, and I am sorry to say that the opponents of our small vein coal are no better.

In my last report, I made mention of the whole of the minerals of Maryland, not being known or reported by any man yet.

Last September, William A. Montell, Superintendent of the Grant Coal Company, opened a new vein of coal in Alleghany county, seven feet high, containing per acre, 11,291 tons, and from the superiority of the roof, can take out of each acre 10,000 tons. There is also opened on the lands of Dr. S. P. Smith, of Cumberland, another vein, ~~also on the~~ Grant Coal Company's lands, eleven feet high, about two feet of it not markable, leaving nine feet of good coal, containing per acre, 14,517 tons of coal: in the same report I showed that we have opened up veins of different heights, making in the aggregate, twenty-seven feet high, containing, 43,551 tons per acre. In this present year, these two veins of Grant Company and Dr. Smith's, were discovered, making altogether forty-three feet high, and containing per acre, having these veins, 79,356 tons of coal; these figures plainly show that one acre of coal land, ~~having all these veins on it,~~ would be worth seven acres of the big vein coal alone.

Another public improvement is about to start, the Piedmont and Potomac Railroad, commencing at Bloomington, Garrett county, and running south and up along the north branch of the Potomac river, which will open up the largest coal regions in this State. It embraces all the coal lands on both sides of the river in Maryland and West Virginia. It reaches the Big Run at the Elk Garden, in West Virginia, and the Swan property in Maryland. This Piedmont and Potomac Railroad opens up a territory having a superficial area two thousand square miles. It is the best blacksmith coal in the world.

All coal south of the Baltimore and Ohio Railroad is better for such purpose, and for what is called western trade, than coal north of said road. It will be a feeder for the Chesapeake and Ohio Canal, for the Baltimore and Ohio Railroad, and if the Cumberland and George's Creek be extended from Lonaconing to Bloomington, a distance of ten miles, then we would have direct communication to New York, and all Eastern markets.

In my last Annual Report I stated, that Garrett county would be the garden spot of Maryland. Present discoveries have proved it to be so. There is considerable excitement

over the finding of silver ore on both sides of the Savage river, in the said county.

There are gangs of men at work on the lands of Elie Morrell, Hiram Duckworth, and others. They have found some, and analyzed it, and it has proved to be worth \$117,50 to the ton. They have only reached the top, or cross part of it yet.

I am satisfied that the whole country around here is underlaid with silver ore and other minerals, not known to many. In the year 1878, there were shipped from the George's Creek Coal region, via the Baltimore and Ohio Railroad to different points West, for blacksmith purposes, about 30,000 tons; in 1879, to the same places, 43,853 tons, with a strike of thirty-five working days. When the Piedmont and Potomac Railroad shall be completed, which will open up the Elk Garden region, the second year of the trade to the West, will amount to 100,000 tons, and always increasing.

TABLE No. 1.—DETAILS OF PRODUCTION OF 1870.

Statistics of the Cumberland Coal Trade, from its Commencement—Compiled from Official Sources in the Office of the Cumberland and Pennsylvania R. R. Co., B. B. Savage, Md.

NAME OF COMPANY OR MINE.	1870.						COMPARED WITH 1878.		
	To B. & O. R. R. To & O Canal		To P. & B. R.		Local.		Total.	Increase.	Decrease.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
Consolidation Coal Company.....	331,648	123,145	1,829	433,693	73,677	12,892	51,876	18,808	
New Central Coal Co.....	113,467	36,611	123,643	354,269					
Borden Mining Co.....	20,164	101,742	24,453	157,938	26,266				
George's Creek Coal and Iron Co.....	114,441	14,491		139,932	32,073				
Hamp. and Balto. Coal Co.....	89,491	16,236		105,694					
do. Va. Mines.....	102,283			104,268					
Franklin Coal Company.....	30,682	67,805		98,471	19,679				6,611
American Coal Co.....	76,601			76,601					
Potomac Coal Company.....	21,933	47,188		69,096					
Maryland Coal Company.....	66,888			66,888					8,152
Atlantic and George's Creek C. C. Co.	41,429		150	43,579	3,959				
Swanton Mining Company.....	2,648	36,929		40,127	12,433				
Biscan Avon Coal Company.....	13,261			13,261					
Piedmont Coal and Iron Company.....	2,351			2,351					
do. (Empire Mine).....									
Union Mining Company.....	500			500	80				
North Branch Coal Company.....									
George's Creek Valley Mine.....									
	1,024,947	501,247	154,264	1,750,399	104,675		142,000	51,327	

RECAPITULATION

	To B. & O. R. L.	To C. & P. R. L.	To N. E. R.	Total.	Grand.
FROM.					
Cumberland and Pennsylvania Railroad.....	889,804	197,000	150,000	1,236,804	2,484,810
Cumberland Branch.....	135,953	160,159	296,112	266,148
West Virginia Mines.....
	1,024,947	357,247	150,000	1,532,194	1,750,708

TABLE No. 3.

Table Showing the Men and Horses, and Amount of Coal Shipped by each Company during the Year 1879.

NAMES OF COMPANIES.	Men.	Horses.	Tons of Coal.
Consolidation Company	558	52	483,693
New Central Coal Company	451	42	334,260
Borden	180	23	151,569
George's Creek Coal and Iron Company	248	21	139,933
Hampton and Baltimore Coal and Iron Company	294	22	106,584
Franklin	180	17	102,283
American	150	13	98,927
Potomac Coal Company	124	10	73,345
Maryland	178	16	63,033
Atlantic	120	7	77,323
Swanton	78	31	61,579
River View	55	4	40,737
Flanagan	50	9	15,912
Union Mining Company	13	3	2,293
North Branch	13	3	600
Spangler's Mine, use of Town	16	3	1,500
Rich Land, use of Home Consumption	6	3	200

TABLE No. 4.—(Non-Fatal Injuries.)

Names of Persons Who were Haimed and Injured in and about the Mines of the Mining Districts of Allegany and Garrett Counties, during the Year 1879.

Date	Names of Persons	Names of Mine.	Remarks.
Decr.	John Murphy	Franklin	Collar bone broken, mine cars.
July	Edwin	Big Vets	Top coal.
Nov.	William Felleck	Contra	Run over by the cars.
May	James Wagner	Borden Shaft	Fall of top coal.
Nov.	Thomas Heath	Borden Shaft	Fall of top coal.
Nov.	Henry Welling	Borden Mine	Fall of top coal.
Decr.	Samuel Tiddy	Borden Shaft	Driver, leg broke.
	Daniel Sheehan	Atlantic	Leg broken by burnt coal.
Oct.	John Harkins	New Mine, Cons'ld's	Fall of roof slate.
Nov.	George Hines	Cons. No. 2	Collar bone broken, breast coal.
Nov.	John W. Hays	New Mine	Ankle broke, breast coal.
Decr.	Wm. Strubs	New Mine	Foot hurt, breast coal.
Decr.	Charles Kroschberg	New Mine	Knee hurt, breast coal.
Decr.	Andrew McCall	New Mine	Shoulder broken, top coal.
		American	None.
		Hampshire	
		Swanton	
		Maryland	
		Geo. C. Coal & F. Co.	
		Bloss Avon	14
		Midlothian	14
		National Mine	02
		North Branch Mine	02
		Empire	03
		Rich Lvs	04
		Spangler Mine	04

TABLE No. 5.

Showing the Killed on the Different Mines for the year 1870.

Date	Name of Person	Name	No.	Particulars
1870	Nov. David Stewart	Franklin	1	5 By jumping out of an engine car on floor.
Oct.	John O'Connell	P. Vein	1	Crushed by breast coal.
Oct.	Frank Gunn, Jr.	P. Vein	1	Breast coal.
Feb.	George Burnett	Big Vein	1	Top coal.
Aug.	Pat'k Cunningham	Keonin	1	Run over by loaded cars.
Dec.	Edward Walsh	Keonin	1	8 Breast coal.
Apr.	John Morgan	Keonin No. 1	1	Top coal.
Jan.	James Horgan	Keonin	1	Top coal.
Aug.	Thomas Quinn	Keonin	1	Top coal.
Oct.	George Myers	Keonin	1	Breast coal.

TABLES

*The following Calculations were made by Professor Johnson
of the Navy Department. The Average Number of Cubic
Feet Required to Stow a Ton of Coal is as follows:*

Description.	Feet.
Cumberland, minimum.....	42.08
Cumberland, maximum.....	41.09
Duffin, Welsh.....	42.99
Cannel, Lancashire.....	46.31
Blasburg, Pennsylvania.....	43.02
Harby, Newcastle.....	44.00
Piton, Nova Scotia.....	45.00
Pittsburg, Pennsylvania.....	41.98
Sidney, Cape Breton.....	47.00
Clourie Hill, Virginia.....	49.02
Cannelton, Indiana.....	47.00
Scott.....	49.08
Richmond, Virginia, Midlothian.....	41.04

ANTHRACITE.

Peach Mountain.....	41.00
Forest Improvement.....	41.07
Beaver Meadow, No. 5.....	39.08
Beaver Meadow, No. 3.....	40.07
Lackawanna.....	45.08
Lehigh Company.....	40.05

COKE.

Natural, of Virginia.....	48.09
Pittsburg.....	70.09
Charcoal.....	104.00

The following Calculations were made by John A. Roeblings & Sons—Breaking Strain of a Wire Rope of 133 Wires.

	Circumfer 'ce Inches.	Diameter. Inches.	Strength. Tons.
No. 1.....	6 $\frac{1}{2}$	2 $\frac{1}{2}$	74.00
No. 2.....	6	2	65.00
No. 3.....	5 $\frac{1}{2}$	1 $\frac{1}{2}$	54.00
No. 4.....	5	1 $\frac{1}{4}$	43.00
No. 5.....	4 $\frac{1}{2}$	1 $\frac{1}{4}$	35.00
No. 6.....	4	1 $\frac{1}{4}$	27.00
No. 7.....	3 $\frac{1}{2}$	1 $\frac{1}{4}$	20.20
No. 8.....	3 $\frac{1}{2}$	1	16.00
No. 9.....	3	$\frac{5}{8}$	11.40
No. 10.....	2 $\frac{1}{2}$	$\frac{1}{2}$	8.64
No. 10 $\frac{1}{2}$	2	$\frac{1}{2}$	5.13
No. 10 $\frac{3}{4}$	1 $\frac{1}{2}$	$\frac{3}{16}$	4.37
No. 10 $\frac{1}{4}$	1 $\frac{1}{4}$	$\frac{1}{8}$	3.48

The following Table will prove of Value. It was originally prepared by Messrs. Porter, Bell & Co, of Pittsburg, Pa.

Weight per Yard.	Tons of 2,240 lbs. per Mile.
16 lbs.....	25 tons, 320 lbs.
20 lbs.....	31 tons, 960 lbs.
25 lbs.....	39 tons, 640 lbs.
28 lbs.....	44 tons, —
30 lbs.....	47 tons, 320 lbs.
35 lbs.....	55 tons, —
40 lbs.....	62 tons, 1920 lbs.
45 lbs.....	70 tons, 1600 lbs.
56 lbs.....	88 tons, —
60 lbs.....	94 tons, 640 lbs.

Crossties per Mile, from Centre to Centre.

1 $\frac{1}{2}$ feet.....	3,520 ties.
1 $\frac{3}{4}$ ".....	3,017 "
2 ".....	2,640 "
2 $\frac{1}{4}$ ".....	2,348 "
2 $\frac{3}{4}$ ".....	2,113 "

Splice Joints per Mile, Two Bars and Four Bolts and Nuts to Each Joint.

Rails 20 feet long.....	528 joints
“ 24 “	440 “
“ 26 “	406 “
“ 28 “	378 “
“ 30 “	352 “

The following Schedules has been Tabulated from the best resources, and the figures may be taken as correct.

Countries.	Square Miles.
Great Britain and Ireland.....	11,900
United States.....	192,350
Germany.....	1,770
France.....	2,086
Belgium.....	510
Austria.....	1,800
Russia.....	30,000
Spain.....	3,501
Portugal.....	-----
Nova Scotia.....	18,000
Australia.....	24,800
India.....	2,004
Japan.....	5,000
Vancouver's Island.....	900
China, Ceylon, New Zealand.....	-----

COAL IN THE UNITED STATES.

The extent of the Coal Fields of the United States is given as 192,350 Square Miles, divided as follows.

	Square Miles.
New England Basin	500
Pennsylvania Anthracite.....	472
“ Bituminous.....	12,774
Maryland Bituminous.....	900
West Virginia.....	16,000
Ohio.....	10,000

COAL IN THE UNITED STATES.—Continued.

	Square Miles.
Kentucky.....	8,983
Tennessee.....	5,100
Michigan.....	6,700
Illinois.....	36,800
Indiana.....	6,450
West Kentucky.....	3,888
Missouri.....	26,887
Texas.....	4,500
Iowa.....	18,000
Nebraska.....	3,000
Kansas.....	17,000
Arkansas.....	9,043
Virginia.....	185
North Carolina.....	310

*Details of the Exports for the year ending June 30th, 1878,
are given below.*

Countries.	Anthr. Bin's.	
	Tons.	Tons.
Austria.....	202	—
Brazil.....	1,852	533
Chili.....	1,993	510
Central American States.....	11	94
China.....	3,659	—
Danish West Indies.....	1,497	11,360
France.....	764	—
Hayti.....	—	713
Italy.....	2,080	16
Japan.....	706	—
French West Indies and French Guinea....	240	615
Miguel and Langley and St. Pierre Island.	30	—
French Possession, all other.....	—	1
Nova Scotia, New Brunswick and Pr. E. Island.....	30,390	5,054
Quebec, Ontario, Manitoba and Northwest Territory.....	268,373	214,982
British Columbia.....	17	22
Newfoundland and Labrador.....	98	—

DETAILS OF EXPORTS.—Continued.

Countries.	Anthr. Tons.	Bitu's. Tons.
British West Indies and British Honduras.	1,471	1,222
British East Indies.....	454	—
Hong-Kong.....	1,359	—
British Possession in Australasia.....	10	—
Hawaiian Islands.....	842	257
Mexico.....	756	3,144
Spanish West Indies.....	101	—
Peru.....	1,878	—
Anore, Madere and Cape Verde Islands...	325	—
San Domingo.....	434	207
Cuba.....	17,983	62,613
Porto Rico.....	43	32
United States of Columbia.....	3,373	17,431
Venezuela.....	630	581
Total	340,661	319,477

The foregoing details in reference to the exports of our American coal in Foreign nations, has been set forth to show how fast our coal trade all over the globe is gaining ground. I would recommend that the Legislature would take out the coal coal, in the first line of section 8, of Ventilation Act of 1878, and also out of the second line of section 9, as it is claimed now by some people, that the Mine Inspector has no power by law to examine any but a coal mine. And as there are two fire-clay mines at work in these counties at present, therefore the Inspector ought to have the power to examine them. He also ought to have power to examine foundries and rolling mills, and all other places where men are at work to ascertain if they have enough air.

I remain, with great respect,

Your obedient servant,

OWEN RIORDAN,

Inspector of Mines.

Year	1870	1871	1872	1873	1874	1875	1876	1877	1878	1879	Total
1870	364,357	385,285	394,337	659,565	104,661	947	182,564	71,359	486,293	643,267	903,495
1871	587,336	291,019	52,251	62,924	52,251	104,472	104,472	90,664	72,433	145,176	1,078,291
1872	687,336	885,249	40,197	7,904	113,019	113,019	113,019	60,658	946,104	254,152	1,148,231
1873	659,115	424,466	160	1,913	158,264	158,264	158,264	60,658	1,230,514	693,161	1,339,645
1874	1,016,771	877,243	2,092,657	3,284,001	3,284,001	3,284,001	3,284,001	60,658	1,431,634	604,137	1,717,075
1875	530,196	530,196	1,429,707	1,803,364	84,941	198,788	32,936	60,658	1,431,634	604,137	2,845,163
1876	1,247,278	656,985	1,803,364	1,803,364	63,944	264,114	264,114	131,264	1,511,547	876,103	2,355,471
1877	1,263,956	612,537	1,916,514	2,016,514	26,186	230,114	230,114	131,264	1,780,710	719,802	2,674,191
1878	1,509,576	641,290	2,265,379	89,555	89,555	431,542	227,114	100,793	1,576,104	167,864	2,419,896
1879	1,298,866	631,882	1,394,463	1,394,463	113,162	248,652	248,652	100,800	1,302,331	879,538	2,442,773
1870	1,696,866	745,673	1,871,768	1,871,768	154,165	219,678	219,678	80,800	1,679,775	832,449	1,835,081
1871	639,762	443,435	1,514,623	1,514,623	159,005	204,200	204,200	7,505	1,618,459	584,464	1,874,339
1872	473,646	473,646	1,319,806	1,319,806	64,161	311,350	174,531	908	926,464	609,264	1,679,832
1873	823,801	486,638	1,435,793	1,435,793	90,456	333,466	333,466	908	1,016,198	501,248	1,730,700
1874	933,246	397,069	1,64,264	1,464,448	141,907	104,388	246,145	51	1,476,969	967,857	35,500,908
1875	15,777,042	9,119,869	967,374	25,814,384	788,623	1,446,448	2,233,971	1,476,969	32,759,260	11,188,691	967,857

CUMBERLAND BRANCH

* Includes 50,251 tons used on line of Cumberland and Pennsylvania Railroad and its branches, and at Cumberland and Piedmont; also 158,586 tons used by the Baltimore and Ohio Railroad Company in locomotives, rolling mills, &c.

† Of this amount 35,149 tons were shipped to Chesapeake and Ohio Canal via Piedmont, B. & O. R. R., to Cumberland.