FIRST ANNUAL REPORT

OF THE

BOARD OF MANAGERS

OF THE

Delaware, Lackawanna & Western Rail-Road Co.

TO THE STOCKHOLDERS.

JANUARY, 1854.

New-York:

COLLINS, BOWNE & CO. PRINTERS AND STATIONERS,

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1854.

OFFICERS AND MANAGERS

OF THE

DELAWARE, LACKAWANNA AND WESTERN RAIL-ROAD CO.

FOR 1854.

OFFICERS.

GEORGE D. PHELPS, ...*President.*
DRAKE MILLS, ...*Vice-President.*
WM. E. WARREN, ...*Treasurer and Secretary.*

MANAGERS.

DRAKE MILLS,
JOHN J. PHELPS.
WILLIAM E. DODGE,
GEORGE BULKLEY,
JOHN I. BLAIR,
GEORGE W. SCRANTON,
ROSWELL SPRAGUE,
THOMAS TILESTON,
MOSES TAYLOR,
JOHN BRADLEY, of New Haven.

STANDING COMMITTEES.

Executive Committee.

DRAKE MILLS,
GEORGE BULKLEY,
WM. E. DODGE,
ROSWELL SPRAGUE,

Finance Committee.

JOHN J. PHELPS,
MOSES TAYLOR,
THOMAS TILESTON.

REPORT.

In presenting their first printed Report, the Board of Managers of the Delaware, Lackawanna and Western Rail-Road Company consider it due, not only to the Stock-holders, in view of their large pecuniary interest, but also to the public, on account of the magnitude of the enterprise, to refer briefly to its past history, as well as to give a statement of its present condition and future prospects.

On the location of the New-York and Erie Rail-Road through the Susquehanna Valley, the project was first started of reaching the rich mineral deposits of the Lackawanna and Wyoming Valleys, constituting "The great Northern Coal Basin" of Pennsylvania, by a locomotive rail-road, extending from Scranton north-westerly, through Ligget's Gap to Great Bend. Soon afterwards, the more formidable scheme was entered upon, of finding an outlet, south-easterly, through the Cobb's and Delaware Water Gaps, in the direction of New-York.

The Charter for the Ligget's Gap Rail-Road, embracing that portion of the Company's present line extending from the Lackawanna Coal Basin, at Scranton, to its junction with the New-York and Erie Road, at Great Bend, had been obtained; and the Company was organized, (the capital having been mainly subscribed by a few of the present Stock-holders,) in the winter of 1850.

The construction of the road was commenced the following Spring, under the immediate supervision of Col. George W. Scranton, who, for that purpose, was appointed General Agent of the Company,* and on October 20th, 1851, it was so far completed as to be open for traffic.

* It is due to Col. Scranton, and also to his associates, proprietors of the extensive Iron Works at Scranton, under the late special partnership firm of

To provide the additional means requisite to finish and equip the road, and for opening and improving the coal lands, &c., further subscriptions to the capital stock were received, and the $900,000 of the mortgage bonds authorized by the Charter, were issued; all of which were taken by the original subscribers.

By an Act of the Legislature, passed April, 1851, the corporate name of the Company was changed to "The Lackawanna and Western Rail-Road Company."

The Charter of the Delaware and Cobb's Gap Rail-Road Co., for a rail-road from Scranton, through Cobb's Gap, to the Delaware River, bears date April, 1849, and the Company was organized in December, 1850.

By an Act, approved March 10th, 1853, the two Companies were consolidated under the name of "The Delaware, Lackawanna and Western Rail-Road Company," and measures were immediately adopted to construct the Road from Scranton to the Delaware River; the necessary surveys having been previously made by E. McNeill, Esq., Chief Engineer of the Company. Books were opened for subscriptions to increase the capital stock, which at the date of the consolidation amounted to $1,441,000, and such was the confidence felt in the success of the enterprise, not only by the original Stock-holders, but by other capitalists, that the whole sum required, $1,500,000, was taken in a few days.

As a matter of convenience in keeping the accounts, the entire line of the road was divided into two sections—the Northern and Southern Divisions; the former extending from Scranton to Great Bend, a distance of 50 miles; and the latter, extending south-easterly to the point of junction with the New Jersey Rail-Roads on the Delaware River, five miles below the Water Gap, 61 miles in length.

Scrantons and Platt, (now the Lackawanna Iron and Coal Company,) to acknowledge the large indebtedness of this Company to those gentlemen for the very efficient and valuable aid rendered by them in the organization and prosecution of this enterprise up to the commencement of the fiscal year, now just closed.

NORTHERN DIVISION.

With a view to derive an income from the works at the earliest possible day, some small sections of this division were passed by temporary structures; the most important of which, were the switch over Tunkhannock Mountain, and the trestles across Factoryville and Humphrey's Hollows. The switch will be abandoned for a direct route through the tunnel, in April, and the embankments across the hollows are in a satisfactory state of progress. By the former improvement, two miles in distance, and a large amount in transportation expenses will be saved; and by the completion of the latter, increased stability and security to the Company's operations will be attained.

To avoid the danger of an interruption to the business of the road from damage to the smaller trestles by fire, or other causes, the Board of Managers have resolved to have them all filled by embankments before the completion of the southern division; when the line, in point of solidity and capacity for traffic, will compare favorably with any other single track road in the State.

The total cost of the Northern Division, up to December 31st, 1853, including engineering, land for depots, right of way, grading, bridging, superstructure, station houses, machine and car shops, car houses, contingent and office expenses, &c. &c., and the amount expended towards the construction of the Tunnel, is $2,162,048 75.

The cost of the Equipment of the Road, comprising the following, viz:

13 Locomotive Engines,* 10 Passenger and Baggage Cars, 60 House and Platform Freight Cars, 854 Coal Cars; ma-

* In addition to the motive power here reported, the Company have now nearly completed a model engine of great power, constructed for burning Anthracite coal; and should their anticipations, in this respect, be realized, they design at once to order several more of the same character. Coal-burning engines are now in successful operation on the Reading and other roads, and it is believed that they will soon come into very general use, thereby causing a large increase in the consumption of Anthracite coal, and at the same time effecting a vast saving in the cost of fuel, no small item in the running expenses of all Rail-Roads.

chinery and tools in the machine and car shops, at Scranton, and some other smaller items, is $395,724 64.

ORGANIZATION.

For the more convenient management of the business of the Company, on the line of the works, the several branches have been divided into four distinct departments, each of which is placed under a Head, subject to the President and Board of Managers. These departments and the names and titles of the Officers now in charge of them respectively, are as follows:

Departments.	*Names of Officers.*	*Titles.*
CONSTRUCTION,	Edwin McNeill,	Chief Engineer.
TRANSPORTATION,	D. H. Dotterer,	Superintendent.
COAL DEPARTMENT,	J. J. Albright,	General Coal Agent.

MACHINE AND CAR SHOPS, under the supervision of D. H. Dotterer, Superintendent.

OPERATIONS OF THE PAST YEAR.

CONSTRUCTION DEPARTMENT.—Besides the work done on the Southern Division, and in constructing the great tunnel, and filling in the high trestles over the hollows in the Northern Division, there have been erected a commodious passenger car-house at Scranton, a station house at Oakley's Station, two large wood sheds, one at Clark's Summit, and the other at Tunkhannock, and about five miles of second track laid, for turn-outs, sidings, &c.

MACHINE AND CAR SHOPS.—Besides making provision for all the ordinary repairs of the locomotives and cars in use on the Rail-Road, and the machinery and mine cars in the use of the Coal Department, in view of the very favorable location of the village of Scranton, for such purposes, and the facilities afforded for procuring ample supplies of iron, and the various kinds of lumber and other materials necessary, the Board of Managers early made arrangements for the erection at that place, of capacious buildings for Shops, and

supplying them with the necessary tools and machinery for the manufacture of cars, of which it was foreseen that a large additional number would soon be required.

According to the Report of the Clerk of the Shops, transmitted by the Superintendent, the amount of work done, (labor and materials,) during the year, was $124,048 98, divided as follows, viz:

Transportation expenses, for repairs of engines and cars, including oil, tallow, and waste, used in running the trains, &c.....	$24,424 92
Northern Division, (Construction,) for repairs of engines and gravel cars, employed at the tunnel, clearing cuts, filling in trestle work, erecting the new car house, &c. at Scranton, also including 42 new single, and 24 double gravel cars,.....	15,239 09
General Expenditure, for the following new cars built, viz:	
1 Second Class Passenger Car, 12 House Freight Cars, 11 Platform Freight Cars, 12 Platform Dump Freight Cars, 240 4-wheel Coal Cars, 5 8-wheel Coal Cars, 2 Wood Cars, 3 Caboose Cars,.....	69,891 58
Work done for the Coal Department, and for Contractors on the Southern Division, &c.,.....	14,493 39
	$124,048 98

The cost of the machinery and tools in the Shops, is $29,055 05.

The value of the stock of materials on hand, on 31st Dec. 1853, as per Inventory, was $44,796 77.

Transportation Department.—The completed portion of the Line, being the Northern Division, has been successfully operated during the past year, under the careful superintendence of D. H. Dotterer, Esq. The trains have been run with great regularity, and without loss of life or material

injury to any passenger, or the occurrence of any other serious accident.

During the year, 43,726 passengers, and about 100,000 tons of anthracite coal, 10,000 tons of iron, and 34,000 tons of other freight, have been transported over the road.

The gross earnings from this branch of the Company's business, during the year, as shown in detail by the accompanying tables were,..... $191,920 61

Deduct the total expenses of operating and repairs of road, repairs of machinery and cars, superintendence, &c., ... 95,633 65

Balance, being the nett revenue, to the credit of the general Income Account of the Company, $96,286 96

COAL DEPARTMENT.

As the Charter of the Company limits them to the possession of 1,000 acres of coal lands, care was taken at an early day, to secure some of the choicest tracts in the valley, lying in the immediate vicinity of their principal depot, at Scranton. The amount expended in the purchase of these lands, the cost of opening mines, and erecting the necessary machinery and fixtures for working them, and preparing the coal for market, including also the expense of sundry improvements at other places, for stocking and shipping coal, is $145,422 01.

During the past year the steam power coal breaker, at the Diamond Mines, (commenced in 1852,) has been completed and put into operation. Additional screens and schutes, and other apparatus for preparing the coal for use, and loading it in cars, have been erected, the importance of which will be stated hereafter

Contracts have been made for sinking two slopes and a shaft near the present openings, at the Diamond Mines, for the purpose of reaching the lower and larger veins, and considerable progress has been made in the work. The necessary engines and other machinery for working these new openings are all being built.

At the commencement of their coal operations, and until about January, 1853, the Company worked their own Mines, but it was subsequently deemed expedient to have this work done by contract. Accordingly, an agreement was entered into on 1st of April last, with Mr. Thompson Peckens, and his associates, for working the Mines of the Company, for the term of five years; the Company paying him stipulated prices per ton, for coal mined, prepared and loaded into the transportation cars; and the contract has thus far been performed to the satisfaction of the Board.

The stock of coal on hand on 31st of December, 1852, (see annexed exhibit "E.,") was		10,718,02	tons.
During the past year, there were taken from the Diamond Mines.....	75,347,03		
Purchased from other parties ...	21,890,17	97,238,00	"
		107,956,02	"
Of which sales were made to the extent of..		103,931,05	"
Leaving the stock on hand, Dec. 31, 1853,..		4,024,17	"
The total sales of coal, as above stated, produced the gross sum of		$358,191	46
and the estimated value of the stock remaining on hand, Dec. 31, 1853, was.....		9,117	15
		$367,308	61
The value of coal on hand, Dec. 31, 1852, was estimated to be	$36,553 99		
The total expenses of mining, transportation, repairs of fixtures, superintendence, &c. during the year, was	254,809 53	291,363	52
Showing the nett revenue from this department to be.....		$75,945	09

As is common to all new enterprises of this nature, some embarrassment has arisen from want of experience; and in the commencement of the Company's operations, not having

the necessary apparatus for preparing their coal in a proper manner, they were under the necessity of forwarding it to market in the condition in which it came from the mines. In consequence of this, a prejudice was created in the minds of some consumers against the *quality* of the coal, but the managers feel assured that they have now removed the difficulties heretofore encountered in this branch of their operations. They have not only succeeded in reaching the best veins of coal, but by the erection of steam coal breakers, and revolving screens, for preparing it, and extensive pockets and schutes for loading it into the cars, they now possess every facility for shipping it in the best possible order.

Besides the openings already made, and the two new slopes and shaft now being constructed at the Diamond mines, the Board have resolved to proceed at once to the erection of similar works on the Griffin farm.

The results of the past year's business, with the product of less than 100,000 tons of coal, have been already stated. It is the intention of the Board to increase the amount in 1854 to 200,000 tons, and arrangements have been made accordingly. Judging from the sales already effected, and the constantly increasing demand, it is believed that the whole amount may be disposed of at satisfactory prices.

In view of the large prospective demand for our Coal, and the necessity of making timely arrangements for supplying the same, and in order not only to ascertain the quantity of coal on the lands, but also to establish its quality, the Board have recently had the whole most thoroughly surveyed, both by Mr Needham, Mining Engineer, and Prof. H. D. Rogers, State Geologist of Pennsylvania, the results of which are, in all respects, highly satisfactory.

From the very elaborate and interesting report of Professor Rogers, which has recently been published in Boston, copious extracts, together with a cut representing a section of one of the coal measures will be found appended hereto. See page 33.

Mr. Needham having made very careful surveys, borings

and other minute examinations, has furnished plans, sections and reports, (see page 31,) in the accuracy of which the Board have great confidence. From both these surveys it will appear that the quantity of minable Coal on the Company's lands will exceed FIFTY MILLIONS OF TONS; that the different veins are adapted, respectively, to the various purposes of generating steam, smelting and manufacturing iron, and for all other manufacturing and domestic uses; and that the *quality* for all these various purposes is fully equal to any other coal produced.

Should the supply of coal from the Company's mines at any time prove inadequate to the capacity of the road, ample quantities will be offered by the proprietors of other colleries in the vicinity. In addition, the Lackawanna and Bloomsburg R. R., soon to be built, will open to market every coal field in the Wyoming valley, including the valuable red ash coal of Plymouth, by the shortest and most favorable route to tide water. Upon the completion of the Southern Division, and the connections now in progress, Coal may be transported from the mines at Scranton and Wilkesbarre to Elizabeth Port, or Jersey City, opposite New-York, in 10 hours time. An order may be given by telegraph in the morning, and the Coal delivered at tide water the same evening—*and at all seasons of the year.*

FINANCIAL CONDITION.

The financial condition of the Company at the close of the year is shown by the following condensed statement—the details being given in the annexed balance sheet and accompanying tables prepared by the Treasurer.

DR.

Cost of construction and equipment of the Rail-Road, as already stated,	$2,737,839 45
Cost of coal lands and improvements thereon, see page 8,	145,422 01
Amount carried forward,	$2,883,261 46

Amount brought forward,			$2,883,261 46
Cash on hand and on call, provided for payment of interest on bonds and stocks, 1st January,			90,035 38
Cost of materials on hand, including wood for fuel, and the stock of materials at the shops			51,136 12
Coal on hand, 4,024 7-20 tons,			9,117 15
Bills and accounts receivable,			184,398 19
			$3,217,948 40

Cr.

By capital stock, amount paid in,	$1,958,507 50		
" Mortage bonds,	900,000 00		
" Bills and accounts payable,	224,797 21		
" Interest due on bonds 1st January, 1854,	31,500 00		
" Interest due on stock, payable 10th January, 1854,	70,247 03	$3,185,051 74	
Showing a balance of			$32,896 66

being the amount of profits of the last years' transportation and coal business, after paying all expenses, interest on bonds and on the stock from date of consolidation.

It will be remembered that in order to induce a more ready subscription to the increased capital stock, it was agreed by the Stock-holders at their meeting in March last, that they would waive a credit of interest on their stock, from the 8th March, 1852, to 1st May, 1853, thus giving the new subscribers a corresponding advantage. The results of the past year have fully equalled the expectations of the Board; although, in consequence of numerous breaks in the Erie Canal and the burning of a steamboat employed in towing, on Cayuga Lake, a less quantity of coal was got to market than was intended.

In pursuance of the provisions of the act of consolidation (which authorizes the payment of interest to the Stock-holders their stock until the completion of the entire line of the

Road, and the charging of such interest to the cost of Construction—all of the earnings of the Company meanwhile to be credited to the same account), the Board resolved to pay interest at the rate of six per cent. per annum on the stock up to the 31st December, 1853, as follows, viz: On all of the old (Lacka. & Western) stock, from May last, and on the several instalments paid in on the new subscriptions, from the dates when received.

After providing for this interest on the stock, and the accrued interest on the bonds, there is left a balance of $32,896 66,—equal to nearly two per cent. on the whole capital paid in, which, instead of being divided among the Stock-holders, is required to be appropriated to the construction of the road, as above stated.

SOUTHERN DIVISION.

This section of the road extends from Scranton through Cobb's Gap and the Delaware Water Gap to a point on the Delaware River 5 miles below the Water Gap, a distance of 61 miles, where it connects with the Warren Rail-Road of New Jersey.

Anticipating a very large business on this division of their road, the Board of Managers resolved to grade, bridge, and do the masonry for a double track, all in the most substantial and permanent manner; consequently, no trestles or other temporary structures are to be erected. In order to secure a satisfactory grade, and to avoid high and long bridges, it was deemed expedient to pass two small sections by tunnels.

In reference to the very favorable line and grades secured, it is due to our indefatigable Chief Engineer, to state, that he devoted many months of almost incessant labor in obtaining crest-line and other preliminary surveys of the whole region, before adopting the present route; which the Board of Managers are satisfied is the *best*, if not the only practicable one, for a road of heavy traffic, from the Lackawanna and Wyoming Vallies, to tide-water, in the direction of New-York.

(See Mr. McNeill's report, page 23.)

This division was put under contract in June last, the work was immediately commenced, and is now under good progress. The iron rails and chairs have been contracted for, on favorable terms.

It was the intention of the Board of Managers, at first, to have this division ready for operation within the present year, but several causes have concurred to postpone its completion. It may now be safely assumed that the entire line will be in operation on or before the first day of June, 1855.

The amount expended towards the construction of this division, up to the close of 1853, was $180,066 06.

It will be seen from the foregoing, that the total amount expended in the construction and equipment of the whole Road, is as follows:

Northern Division, ...	$2,162,048 75
General Expenditure, for Equipment, &c.	395,724 64
Southern Division, ...	180,066 06
	$2,737,839 45

For the grades, capacity, &c. of this Division, see the annexed report of the Chief Engineer.

CONNECTING LINES.

EASTERN AND SOUTH-EASTERN.—The direct route to New-York from the south-eastern terminus of the Southern Division will be by the Warren R. R., 18 miles to New Hampton Summit, and thence by the Central Rail-road of N. J. via Elizabethport; or via Elizabethtown and New Jersey R. R. to Jersey City.

Favorable contracts for doing the business of this Company have been entered into with these two Companies (the Warren and Central); the latter Company having agreed to lay an extra rail conforming to the guage of this Road. It is further provided that a second 6 ft. track shall be laid whenever the freight from this Company shall amount to 400,000 tons per annum.

As the Warren Rail-road crosses the Morris Canal at a favorable point for the tran-shipment of coal, it is expected that a considerable portion of coal business during the summer season will be done through this channel.

The Board also entertain hopes of supplying the Morris and Essex R. R. Company with coal for the Eastern market, and to meet the large demand for the manufacture of iron, and for other purposes upon the line of that Road.

It is further anticipated that the Trenton and Belvidere R. R. Company will extend their Road from Belvidere to the south-eastern terminus of our Road, a distance of four miles, and thus open a direct communication between Northern New-York, the Lakes and Canada, and Trenton, Philadelphia, and the South. The addition of a single rail to the point of its junction with the Feeder of the Delaware and Raritan Canal, will open another great avenue by a *descending grade* to tide-water; whence coal, lumber, &c., may be shipped by the large propellers and barges of that Company to the eastern markets.

Still another, and very important connection is anticipated from the continuation of the Philadelphia, Easton and Water Gap R. R. from Easton to the Water Gap, the privilege of doing which, with a 6 ft. guage, was granted to that Company at the last session of the Pennsylvania Legislature. This would open a 6 ft. guage road from Philadelphia, by the most *direct route*, and *easiest grades*, to every section of Western New-York and the Northern Lakes. Its great importance to Philadelphia, and the South generally, will doubtless secure for it an early completion.

In addition to the foregoing, the Hudson and Delaware R. R. extending from Newburg to the Water Gap has been located, and the section between Chester and Newburg has been constructed as a branch of the Erie road. The construction of the Providence, Hartford and Fishkill R. R., now in progress, renders this connection of vast importance; and it is a reasonable supposition, that it will be made at no distant period.

WESTERN AND SOUTH-WESTERN CONNECTIONS.—Referring to the accompanying report of the Chief Engineer, in which these are noticed at length, or to the report of the Lackawanna and Bloomsburg R. R. Company, recently published, the irresistible inference to be drawn therefrom, is: That the Sunbury and Erie, the Alleghany Valley, and the Lackawanna and Bloomsburg R. R. connecting with this Road at Scranton, will secure to New-York her nearest and best channel of communication with the West and South-west, and to this Road, the many positive advantages claimed for it; among which may be named as worthy of especial attention, the great facilities which its construction will furnish the Company for extending indefinitely their coal business, and for its safe and economical management.

NORTHERN AND NORTH-WESTERN CONNECTIONS.—At Great Bend, 186 miles from New-York by this route, the Delaware, Lackawanna and Western R. R., connects with the New-York and Erie, over which, by a perpetual contract, its freight and coal trains, and passengers are conveyed on favorable terms, both East and West.

At Binghamton, 14 miles West of Great Bend, the first tributary to this Road—the Syracuse and Binghamton R. R.*—branches off, constituting a link in the most direct route from Philadelphia and New-York, to Syracuse, Oswego, and the Canadas, and this must soon become an important channel for the distribution of coal and iron. The character and importance of this connection may be best learned by reference to the interesting report just published by the Directors of that Company, from which liberal extracts are appended.† (See page 45.)

The Albany and Susquehanna, and the Utica and Binghamton Rail-Roads, also diverging from the Erie at this point (the former now in the course of construction), cannot fail to contribute largely to the traffic of this Company, forming additional outlets for coal, &c.

*This Road is now graded ready for the superstructure, and the Company expect to have it open for business early in the ensuing fall.

† The Iron Rails for this Road have been purchased, and are to be immediately id.

Large quantities of the Company's coal are at present tran-shipped at Binghamton, upon the boats of the Chenango Canal, and thence forwarded to Utica and other points on the eastern section of the Erie Canal. The rich iron ore beds of Clinton, which furnish supplies for the Iron Works at Scranton, and the gypsum and limestone from other places on the Chenango Canal, afford valuable back freight for both the boats and the Company's cars.

Proceeding westerly 22 miles from Great Bend on the Erie Road to Owego, the next connection in order and importance, (if not the first in the latter respect), is the Cayuga and Susquehanna R. R. extending 34 miles northward from that place to Ithaca, at the head of Cayuga Lake, at which point is the present principal Coal depot of the Company, from whence its coals are tran-shipped into boats and distributed by the various New-York Canals and the Lakes. Large quantities of salt, flour, and other supplies required in the Lackawanna Valley, are here offered as return freight by the Company's coal and other freight trains. A Canal from the outlet of this Lake to Great Sodus Bay on Lake Ontario, is in progress, and its projectors and friends are now sanguine of its completion at an early day. The capacity of this Canal will be such, when finished, that the propellers and sailing vessels from the larger Lakes can land their cargoes at Ithaca, and receive in return, Coal destined for Canada and the North-west, direct from the cars of the Company.

Diverging from the Cayuga and Susquehanna R. R. at Pugsley's Station, 8 miles South-easterly from Ithaca, the Auburn and Little Sodus Bay R. R. commences, and passing through Auburn and the rich, fertile country intervening, terminates at Little Sodus on Lake Ontario, thus forming another important communication with Canada and the West. The grading of this Road is nearly completed, and its Managers hope to have it opened for business early in the spring of 1855.

Continuing on the N. Y. and Erie R. R. we meet successively the Elmira, Canandaigua and Niagara Falls R. R.

diverging at Elmira; at Corning, the Buffalo, Corning and New-York R. R.; and at Hornellsville, the Buffalo and New-York City R. R.; at Olean, the Erie and New-York City and other projected routes, and all converging from the West and North-west to Great Bend and New-York.

All these connecting lines being of the broad or 6 ft. guage, form an uninterrupted communication from New-York to their several termini.

It will be seen from the foregoing statements, and by reference to the accompanying map, that the Delaware, Lackawanna and Western Rail-Road forms a great trunk line from the Delaware River, near the Water Gap, to the Susquehanna River at Great Bend, with diverging branches.

Leaving out of view the fact, that this road will be a great channel for the transportation of Coal, its importance as a general freight and passenger road should not be overlooked. From the statements and reports herein contained, it will be seen, that the grades and distances are extremely favorable for freight. Passengers will have an opportunity of visiting that great natural curiosity, the DELAWARE WATER GAP, from which point the road ascends the "POCONO," by easy grades; across the high table lands of which it passes for about twenty miles,—and from which point the view is of extraordinary extent and beauty. Further on, the Wyoming and Lackawanna Valleys possess great attractions for visitors,—and the route generally, it is believed will be a favorite one, for pleasure travel.

All of which is respectfully submitted.

GEORGE D. PHELPS, *President.*

MANAGERS:

DRAKE MILLS,	GEORGE W. SCRANTON,
JOHN J. PHELPS,	ROSWELL SPRAGUE,
WILLIAM E. DODGE,	THOMAS TILESTON,
GEORGE BULKLEY,	MOSES TAYLOR,
JOHN I. BLAIR,	JOHN BRADLEY,

New-York, Jan. 2d, 1854.

THE DELAWARE, LACKAWANNA AND WESTERN RAIL-ROAD CO.

Balance Sheet, December 31st, 1853.

PAGE.				
10.	To Construction,			
	Northern Division,	2,162,048 75		
	Southern Division,	180,066 06		
	General Expenditure,	395,724 64		
16.	" Coal Department.—Construction,		2,737,839 45	
	Coal Lands,	102,155 31		
	Opening Mines, Steam Coal Breaker, Mining Fixtures, Coal Yards, Scales, &c,	43,266 70		
			145,422 01	
4.	" Cash.—Amount on hand and on call,		90,035 38	
	" Materials on Hand,			
58.	Machine Shop,	39,691 69		
62.	Wood, 6890 Cords,	11,444 43		
84.	" Coal Account,		51,136 12	
	4024 17-20 Tons on hand		9,117 15	
30.	" Bills Receivable,			
	Due in January, 1854,	34,808 48		
	" " February, "	30,370 83		
	" " March, "	25,877 53		
	" " April, "	699 49		
	" " June, "	35,000 00		
	" Accounts Receivable,		126,756 33	
78.	Geo. W. Scranton, General Agent,	1,346 41		
88.	J. J. Albright, Gen'l Coal Ag't, per exhibit "B," Amount outstanding on sales of Coal,	9,254 93		
92.	W. N. Jenks, Agent, per exhibit "C," Amount outstanding for Freight,	14,816 97		
106.	The New-York and Erie Rail Road Co.,	957 90		
108.	The Lackawanna Iron and Coal Co.,	293 25		
110.	Horatio W. Nicholson,	695 10		
119.	Cayuga and Susquehanna R. R. Co.,	2,773 40		
123.	Patchin Bank, Buffalo,	536 53		
158.	Geo. W. Scranton,	330 37		
402.	U. S. Post Office Department,	497 42		
586.	Noyes & Phinney, Contractors,	4,782 00		
586.	M. L. Noyes,	400 04		
	Miscellaneous Accounts,	20,967 54	57,641 86	
			$3,217,948 40	

PAGE.				
1.	By Capital Stock,			
	30,243 Shares paid in full,	1,512,150 00		
	29,720 " on which has been paid,	446,357 50		
	59,963			1,958,507 50
401.	" Mortgage Bonds, payable 1871,			900,000 00
20.	" Bills Payable,			
	Due in January, 1854,	30,054 12		
	" February, "	1,742 38		
	" March, "	10,232 00		
	" April, "	22,180 00		
	" July, 1855,	375 30		
	" July, 1856,	45,450 30		
				110,034 10
	" Accounts Payable,			
15.	John A. Robinson,	10 00		
18.	John J. Phelps,	13 74		
160.	M. W. Scott,	21 50		
586.	Phelps, Dodge & Co.,	357 85		
131.	" Miscellaneous Accounts,			
	Due on December Accounts,	93,526 90		
505.	Interest on Bonds, payable January 1st, 1854,	31,500 00		
510.	Ditto " Stock, " " 10th, "	70,247 03		
179.	Mrs. Lucilla S. Silkman,	10,000 00		
179.	Nancy Tripp, due July 1, 1856,	5,000 00		
180.	Sam'l Tripp, " May 1, 1855,	1,000 00		
180.	Benj. S. Tripp, " July 1, 1854, 2,000 00			
	" " 1, 1855, 2,000 00			
	" " 1, 1856, 833 12			
		4,833 12		
				216,510 14
124.	" Income Account, per exhibit "A,"			22,896 66
				$3,217,948 40

(E. E.)

WM. E. WARREN, Treasurer.

EXHIBIT "A."

INCOME ACCOUNT, 1853.

Credit.

By TRANSPORTATION, per Exhibit "D,"		$96,286 96
COAL ACCOUNT, " "E,"	75,945 09	
Less for new openings made,	2,205 93	
		73,739 16
RENTS, collected during the year,		1,042 40
		$171,068 52

Debit.

To 6 mos. INTEREST ON BONDS, due 1st July, 1853,	$31,500 00	
" " " 1st Jan. 1854,	31,500 00	
" " ON STOCK, due 10th Jan. 1854,	70,247 03	
" on Floating Debt, being the general interest account for the year,	4,924 83	
		138,171 86
Leaving a balance of		$32,896 66

To the credit of CONSTRUCTION ACCOUNT, in pursuance of the 6th section of the Act of Consolidation.

EXHIBIT "B."

J. J. ALBRIGHT, *General Coal Agent.*

(*Outstanding Accounts for Sales of Coal.*)

The Cayuga and Susquehanna Rail-Road Company,	$3,083 79	
Agency at Buffalo,	903 26	
" Syracuse, Hatch & Burt, Agents,	1,500 00	
" Ithaca, J. Lippincott, Agent,	466 34	
J. J. Albright, General Coal Agent,	3,316 54	
		9,269 93
Deduct, Amount due Bacon & Prescott, over payment,		15 00
		$9,254 93

EXHIBIT "C."

W. N. JENKS, *Agent.*

(*Amount outstanding for Freight.*)

SCRANTON STATION,	E. G. Coursen, Agent,	$3,202 02	
ABINGTON "	Norman Phelps, "	195 73	
FACTORYVILLE "	U. V. Mace, "	85 52	
TUNKHANNOCK "	A. B. Fuller, "	362 43	
MONTROSE "	Benj. Case, "	84 88	
NEW MILFORD "	S. H. Morse, "	2 18	
GREAT BEND "	C. B. Stow, "	11 73	
AMERICAN EXPRESS Co.	H. D. Rice, Superintendent,	67 05	
W. N. JENKS, Agent,		10,805 43	
			$14,816 97

EXHIBIT "D."

TRANSPORTATION 1853.

To TRANSPORTATION EXP'S, cost of operating, repairs of road, repairs of machinery, &c.	93,133 65	By FREIGHT EARNINGS, "*a*"	156,102 43
" Proportion of expenses of N. Y. office,	2,500 00	" PASSENGER " "*b*"	33,675 32
	95,633 65	" TRANSPOR'N OF MAIL, "*c*"	2,142 86
" INCOME ACCOUNT: apparent profits for the year,	96,286 96		
	$191,920 61		$191,920 61

("a")

FREIGHT EARNINGS.

1853.	Coal.	Merchandise.	Express.	Total.
January,	1,206 90	3,253 55	20 31	4,480 76
February,	2,140 36	1,769 27	16 18	3,925 81
March,	5,807 06	1,725 37	19 30	7,551 73
April,	6,948 90	2,599 48	19 95	9,568 33
May,	8,044 25	4,967 31	29 73	13,041 29
6 84 June	9,552 36	4,811 81	31 00	14,395 17
19 22 July,	11,173 12	3,793 63	19 03	14,985 78
August,	14,826 11	4,177 48	20 00	19,023 59
30 21 September,	13,027 29	6,479 75	28 88	19,535 92
80 87 October,	12,164 65	7,917 59	33 25	20.115 49
November,	9,650 66	7,414 61	44 62	17,109 89
877 72 December,	7,453 53	5,862 95	67 05	13,383 53
$1,014 86	$101,995 19	$54,772 80	$349 30	$157,117 29
Less, sundry deductions, overcharges, &c, as stated in left hand margin,				1,014 86
				$156,102 43

("b")

PASSENGER EARNINGS.

1853. *Including Extra Baggage.*

January,	$1,660 85	August,	3,896 71
February,	1,446 31	September,	3,856 91
March,	2,422 99	October,	3,350 89
April,	2,499 59	November,	2,963 86
May,	2,501 34	December,	2,739 95
June,	2,619 33		
July,	3,716 59		$33,675 32

("c")

TRANSPORTATION OF MAILS.

Our contract with the Post Office Department, provides that we are to receive as compensation, $2,500 per annum, less 1-7 for Sundays, omitted, at which rate the amount is, ... $2,142 86

EXHIBIT "E."

1853. COAL ACCOUNT, 1853.

Jan. 1. To Coal on hand this date, 10,718 2-20 tons, valued at	$36,553 99	By COAL SALES, viz:	
Dec. 31. To COAL EXP'S, including mining, transportation, coal purchased, superintendence, agents and clerks, repairs of fixtures, &c., &c., &c. $251,309 53		January,	$ 8,324 77
		February,	9,571 85
		March,	8,396 36
		April,	13,920 86
		May,	30,136 68
		June,	30,248 87
		July,	37,147 83
		August,	52,442 36
		September,	41,039 11
		October,	50,606 11
		November,	50,932 21
Proportion of expenses of New-York office	3,500 00	December,	25,424 45
	$254,809 53		$358,191 46
To INCOME ACCOUNT, Apparent profits for the year	75,945 09	By Coal on hand Dec. 31, 1853: 4,024 17-20 tons, valued at	9,117 15
	$367,308 61		$367,308 61

SUPERSTRUCTURE PER MILE.

Amount brought forward,.....		$1,461,510 63
108 tons rails, at $65, ...	$7,020 00	
10,000 lbs. chairs, at 3 cents, ...	300 00	
4,500 " spikes, " 5½ "	247 50	
2,930 ties, " 25 "	732 50	
Laying track, ...	400 00	
Ballasting track, distributing ties, iron, &c. &c.	800 00	
	$9,500 00	
66 miles Railway superstructure, (turnouts and sidings included,) at $9,500, ...		$627,000 00

BUILDINGS.

Dunnings Station, cost including Water Stations,....	$1,500 00	
Dalesville "	1,500 00	
Turnersville "	1,500 00	
Naglesville "	1,500 00	
Henrysville "	1,500 00	
Stroudsburg "	2,000 00	
Dutotsburg "	1,500 00	
Delaware "	2,000 00	
2 Engine houses,.....	8,000 00	
3 Turn tables,.....	3,600 00	
1 Car house,.....	1,500 00	
8 Wood sheds, ...	4,000 00	
		30,100 00

FURNITURE.

37 Engines, at $11,500, ...	$425,500 00	
8 Passenger Cars, at $2,000, ...	16,000 00	
4 Baggage and Express Cars, at $875,.....	3,500 00	
3000 Coal Cars, at $200, ...	600,000 00	
80 Box Cars, at $600,.....	48,000 00	
60 Platform Cars, at $500,.....	30,000 00	
50 Gravel Cars, at $125,.....	6,250 00	
4 Hand Cars, at $125,.....	500 00	
		1,129,750 00
Total,.....		$3,248,360 63

Adding to the original estimate for grading, masonry and bridging, the following items, not embraced in it, viz: one-half of the superstructure of the Delaware Bridge, ($17,760,) and 100,000 yards earth excavation, for the object already named, ($23,500,) it gives $1,377,016, which is 6 1-10 per cent. below the prices for which the work is let,—a difference more than accounted for by the subsequent advance in the value of labor.

EXHIBIT OF THE PRESENT CONDITION OF THE WORK.

	Cub. yds. Earth Exc.	Cub. yds. Rock Exc.
Estimate of quantities,....	2,397,347.	609,362.
Work done Feb. 1, ...	632,208.	95,518.
Remaining to be done,....	1,765,139.	513,844.
Work done during the mo. ending Jan. 31,.....	150,948.	27,496.

Force at present employed on grading: Men, 2,392; Horses, 314.

CAPACITY.

The annexed Statements, "A" and "B," prepared by D. H. Dotterer, Esq. Superintendent of the Road, showing in detail, the capacity of the Road for transportation, the manner of operating the same, and the furniture required, is based upon the practical working of the Northern Division, and hence furnishes results which should be fully realized.

Making the necessary deductions from this estimate, for the accommodation of two passenger trains and one freight train, it gives for the capacity of the Road for the transportation of coal:

Single track, ... 693,000 tons.
Double track, ... 1,584,000 "

RESOURCES AND CONNECTIONS.

The principal immediate item of revenue will be the transportation of Coal, which upon the Southern Division will only be measured by the capacity of the Road, while the business of the Northern Division, now limited by the demand for Western New-York, will tax its utmost capabilities when the several lines projected in that direction shall be opened.

A large through passenger business is anticipated from the important connections which will be formed as shewn below:

From Philadelphia to Gt. Bend via N. Y. & Erie, . . .	288 ms.	
" " " " D. L. & W., . . .	190 "	
Difference in favor of the D. L. & W., . . .		98 ms.
" New-York to Great Bend via N. Y. & E., . . .	201 "	
" " " " D. L. & W., . . .	186 "	
Difference in favor of the D. L. & W., . . .		15 ms.

These advantages will obtain in favor of all connections with the numerous roads diverging from the N. Y. & E., West from Great Bend.

The Central Rail-Road of New-Jersey, the Warren, the Delaware, Lackawanna & Western, the Lackawanna & Bloomsburg (diverging from the Del., Lacka. & Western at Scranton), the Sunbury & Erie and the Alleghany Valley (connecting Pittsburg with the Sunbury & Erie at Ridgway), together will constitute, for all time, the great central routes from New-York West and Southwest.

The Alleghanies being divided by the West Branch of the Susquehanna, (the route occupied by the Sunbury & Erie,) lower grades are obtained than upon any other line crossing this mountain range.

The connections being made and contemplated with the Sunbury & Erie west of the Alleghanies, being finished, a great saving in distance over going by Erie will be gained. Independent of these, the comparative distances by this route and the N. Y. & E. will be:

From New-York to Erie via N. Y. & E, ...	507 ms.	
" " " via above route, ...	457 "	
Difference in favor of this Central Route, . . .		50 ms.
" New-York to Pittsburg via N. Y. & E. & A. Val'y,	582 "	
" " " via Central Route, . . .	474 "	
* Difference in favor of Central Route, ...		108 "

The construction of the Lackawanna & Bloomsburg, connecting the Northern Division of the D. L. & W. with the Susquehanna R. R., will complete a line uniting Canada with the South, and at the same time make tributary to your road that portion of the coal basin lying south west from Scranton, which is urgently demanded by its prospective business.

The above R. R. distances, coupled with the fact that this line will traverse longitudinally the Lackawanna & Wyoming coal fields, show clearly that the permanent advantages to be derived from its construction will be: To constitute the Northern and Southern Divisions of your road integral parts of two trunk lines connecting New-York with Erie and Pittsburg; and Oswego, Lake Ontario and Canada with Philadelphia, Baltimore and Washington, to place upon your road every variety of coal found in the coal measures of "the Great Northern Basin;" to give stability to the price for mining, by being in communication with a large number of individual operators; and also to preclude the necessity of building many miles of lateral road, otherwise required in extending your coal business.

Apart from the direct connections which will be had with New-York and Philadelphia, other connections, of scarcely less importance, will be secured in

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* This difference would, by the construction of a Road from Corning to Olean, be reduced 25 miles.—*Report of the N. Y. & E. R. R. Co.*

the vicinity of the south-eastern terminus of the Road: The Del. & Raritan Canal connecting with the Trenton and Belvidere R. R., the Morris Canal touched by the Warren R. R. at Washington, and the Morris & Essex R. R., together, thread every mineral and manufacturing district in the State, and must become coal-carrying, to the extent that a demand is created upon these respective lines, while most of them are capacious and cheap channels for the through transportation of coal.

The aggregate amount of coal which will be distributed through the State by these improvements may be inferred from the quantity sold annually upon the line of the Morris Canal, which already exceeds 200,000 tons—a trade which can never be disturbed by the causes which operate unfavorably upon the sea-board.

Though the capacity of the Road, for the transportation of coal, be 693,000 tons, the estimate of revenue will contemplate but a movement of 600,000 tons.

The products of the forest will be large. From the summit of the Road, for a distance of 15 miles, heavily timbered lands extend, indefinitely, in either direction, presenting a wider field for the operation of the lumberman and tanner, than any other within the limits of my knowledge, and which is already attracting much attention. These products, seeking any market, will be transported upon descending grades, and may for the first year be classed as follows:—

15,000,000 ft. Lumber—(transported an average distance of 40 miles.)
5,000 tons Bark, " " "
3,000 " Hides and Leather, " " "
5,000 " Miscellaneous (timber, wood, &c.) " "

Not being able to fix, with the same precision, the revenue to be derived from other sources—the general transportation and passenger business—it will be assumed below the amount which the data in possession would indicate. It will be based upon the through transportation of 50,000 tons per annum, and upon carrying 200 passengers, each way, per day.

REVENUE.

600,000 tons Coal carried 60 ms. at 2c. per ton per m.		$720,000
15,000,000 ft. Lumber " 40 "	$1 per m.	15,000
5,000 tons Bark " 40 "	2½c. per ton per m.	5,000
3,000 " Hides & Leather 40 "	3½c. per ton per m.	4,200
5,000 " Miscellaneous, 40 "	2c. per ton per m.	4,000
Passengers (200 each way per day) $1 50,		180,000
50,000 tons General freight 60 ms. at 3½c. per ton per m.		105,000
Express "		10,000
Mails		6,000
Total,		$1,049,200
Deduct running expenses 55 per ct. (much above the cost of operating the Northern Division,		577,060
Net Revenue,		$472,140

or $\left\{\begin{matrix}472,140\ 00\\3,248,360\ 63\end{matrix}\right\}$ 100 — 14 5-10 per. ct. upon its estimated cost.

It will be remarked that in the above calculation the entire cost of the Road, graded for a *double track*, is an element, while the net earnings of a *single track* only are taken into account.

If the cost of the superstructure of the second track and the equipment necessary be added to the estimated cost of your Road, and the estimate of revenue be made upon the earnings of a double track, it would shew such flattering results as would suggest the expediency of making immediate provision for it.

RIVAL ROUTES.

During the past season two routes have been examined, with the view to connect the Lackawanna & Wyoming coal region with New-York, and also to divert at Waverly the business, now enjoyed by New-York, to Philadelphia.

Reports upon these surveys—the Del., Lehigh & Wyoming, and the North Penn.,—are now made public, which will be noticed to the extent that the construction of these Roads would seem to prejudice your own.

DEL., LEHIGH & WYOMING R. R.

By this Road it is proposed to extend the Morris & Essex R. R. to Wilkesbarre, a point in the Wyoming Valley, 17 miles below Scranton.

From the last report published on this survey, these facts are deduced:

The distance from Wilkesbarre to the Del. River exceeds the distance from Scranton to the same point 15 ms.

The estimated cost of grading for a single track is	$1,672,021	
Add cost of replacing 4,691,000 ft. timber estimated for temporary structures, by embankments or permanent viaducts, assuming it to be proportionate to the cost of replacing similar structures upon the Northern Division of the Del., Lackawanna & Western R. R., ...	400,000	
Add cost of grading for second track 40 per ct. . .	828,808	
Cost of permanent Road for double track, ...		$2,900,829
Estimated cost of masonry, per estimate, ...		100,962
Add Delaware Bridge, not estimated, ...		60,000
Add cost of grading 7 miles for double track, from the terminus of the Del., Lehigh & Wyoming to the terminus of the Del., Lacka. & Western, at $15,000 per m.		105,000
Total cost of grading and masonry for double track,		$3,166,791
The cost of the Del., Lacka. & Western, graded for a double track, *with no temporary structures*, to a point on the Del., 7 miles below the crossing of the Del., Lehigh & Wyoming, will not exceed the estimate heretofore given, viz:		$1,461,510

Showing a difference in favor of the Del. Lac. & Western, of $1,705,281

This enormous difference in cost is attributable to these undeniable facts, established by careful surveys, made prior to the final location of your Road. All tributaries of the Lackawanna and Susquehanna rivers heading on Broad Mountain (with the exception of Roaring Brook, the route of the Del. Lack. & Western), have most of their descent near their source; hence any line, upon which a continuous grade is maintained, will necessarily be at a great elevation above the water, thereby encountering deep ravines, expensive crossings and excessive curvature.

The Lehigh and Tobyhanna creeks heading upon the table-lands which form the summit of Broad Mountain, are crossed by your Road at elevations of eight (8) and twenty-five (25) feet respectively. Immediately below, these streams become rapid and are, at once, divided by formidable ridges, as shown by the "*average*" crossings of one hundred and nineteen (119) feet met with upon the route of the Del., Lehigh & Wyoming R. R. In the descent of the southern slope of Pocono the maximum grade* upon the Del., Lehigh & Wyoming is ruled by the crossing of Pocono Creek, distant from Hippy's Gap (summit) 9 miles, while from the summit of the Del., Lacka. & Western (35 ft. below Hippy's Gap), a continuous grade, for a distance of 15 miles, is secured.

The governing point upon the Del., Lehigh & Wyoming being but 9 miles from their summit, high crossings are made necessary to reduce to a minimum the grade upon that portion of the Road, which will account for the large estimated cost of that Division.

The grades of the Road as set forth being the "*average*" instead of the *maximum* grades, its absolute capacity is indeterminate: It is, however, shown that

* See Report of Capt. Beach, made in 1831, page 9, from which it appears that no grade exceeding 50 feet per m. need be employed in Pocono Valley.

à summit (Hippy's Gap) is to be overcome, distant from Wilkesbarre, 41 miles.
From Wilkesbarre to the summit of the Del., Lacka. & Western, via
Scranton, ... 35 "

Difference, ... 6 miles.
Distance from Wilkesbarre to Scranton by the surveyed route, . . 17 "
Cost of this Road ready for the superstructure, $133,584. The expenditure then of $133,584 in the construction of the Wilkesbarre & Scranton R. R. as opposed to $3,061,791 required for the Del., Lehigh & Wyoming, would secure to the Wyoming Valley the greatest desideratum, viz: *The best connection with the Delaware Water Gap.*

NORTH PENN. R. R.

This line would connect Philadelphia with the N. Y. & E. R. R. at Waverly, via Freemansburg, Mauch Chunk, and Pittston.

The resources of this Road are based upon the assumption that Waverley is 40 miles nearer Philadelphia than New-York, and hence it is presumed that the country north and west from this point would become tributary to Philadelphia.

The construction of eight miles of road, from Factoryville, (on the Northern Division of your Road,) to Tunkhannock, and for which a charter exists, would reduce the distance of 40 miles, in favor of Philadelphia, to 3 miles, and the distance to tide water would be 11 miles less.

Further: from the summit of Broad Mountain, crossed by either line, the maximum grade, in the direction of Philadelphia, is 52 8-10 feet per mile,* while the highest opposing grade, in the direction of New-York, is 22 feet per mile.

The result then of these surveys have been to demonstrate, that the shortest and least expensive line connecting the Northern Penn. Coal Field with New-York, is the Southern Division of the Del. Lackawanna, and Western R. R.; and that the lowest grades have been obtained upon it,—a question, which the preliminary surveys of your Road, exhibiting every important topographical feature of the entire country traversed by the experimental lines referred to, no longer left problematical.

E. McNEILL,
Chief Engineer.

Engineer's Office, D. L. & W. R. R.
Scranton, Jan. 2d, 1854.

STATEMENT "A."

Estimated capacity of the Southern Division of the Delaware, Lackawanna, and Western Rail-Road, with double track from Scranton to the first summit, (5 miles,) and the remainder of the road single track, except about 8 miles siding, for passing places.

PLAN OF OPERATING.

8 First Class Engine, working between the mines and the first summit, taking 20 6-ton cars at a trip, making 9 trips per day, would place at said summit 180 cars; at 6 tons each, would give 1,080 tons; allowing 275 working days to a year, would make 297,000 tons.

9 First Class Engines, working between Scranton and second summit, taking 20 6-ton cars from Scranton to first summit, and there adding 10 more, making 30 cars to the second summit, and each engine making 2 trips per day, would place at second summit, 540 cars per day, at 6 tons per car, would give 3,240 tons; allowing 275 working days per year, would give 891,000 tons.

9 First Class Engines, working between second summit and Water Gap, each making one round trip per day, with 60 or 61 cars each, would give 540 cars, at 6 tons per car, allowing 275 working days to the year, would deliver at the Water Gap, 891,000 tons per year.

19 Engines, in actual service on Main Line.
6 " (extra,) under repairs and in order.
2 " switching and hauling coal from mines to Scranton.

27 Total number of Engines required for coal.

* See Engineer's Report of N. P. R. R.

With about 2,000 cars; based upon the supposition that the cars are to go no further than the Water Gap.

STATEMENT "B."

Estimated capacity of the Southern Division of the Delaware, Lackawanna, and Western Rail-Road, from Scranton to the Delaware Water Gap, 60 miles, with double track.

PLAN OF OPERATING.

2 First Class Engines, working between Scranton and first summit, taking 20 6-ton cars at a trip, each engine making 9 trips per day, would place at said summit, 360 cars, at 6 tons each, would give 2,160, allowing 275 working days to a year, would make 594,000 tons.

18 First Class Engines, working between Scranton and second summit, taking 20 6-ton cars from Scranton to first summit, and there adding 10 more, making 30 cars to the second summit, and each engine making 2 trips per day, would place at second summit, 1,080 cars per day, at 6 tons per car, would give 6,480 tons; allowing 275 working days per year, would give 1,782,000 tons.

18 First Class Engines, working between second summit and Water Gap, each making one round trip per day, with 60 or 61 cars each, would give 1,080 cars at 6 tons per car; allowing 275 working days to the year, would deliver at the Water Gap, 1,782,000 tons per year.

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38 Engines in actual service.
3 " at mines, switching and hauling coal to Scranton.
8 " (extra,) under repairs and in order.

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49 Total number of Engines required for coal.

With 3,500 6-ton cars; based upon the supposition that the cars are to go no further than the Water Gap.

Of the [illegible]he quality, and

		Tons.
Coal,.....		
Shales,.....		
Nodular iron		
Coal,.....	contains	806,000
Shales,.....		
Coal,.....	"	1,680,000
Sandstone an[illegible]		
Coal,.....		
Shale,.....		
Coal,.....	"	3,600,000
Sandstone,..		
Coal,.....		
	"	3,360,000
Sandstone,..		
Coal smut,..		
Shale,.....		
Coal,.....	"	9,600,000
Shale,.....		
Nodular iron		
Shale,.....		
Coal,.....	"	6,912,000
Sandstone a[illegible]		
Coal,.....		
Shales,.....	"	3,520,000
Coal,.....		
Shales,.....		29,478,000
Coal,.....		4,421,700
Fire clay,..		25,056,300
Conglomera		

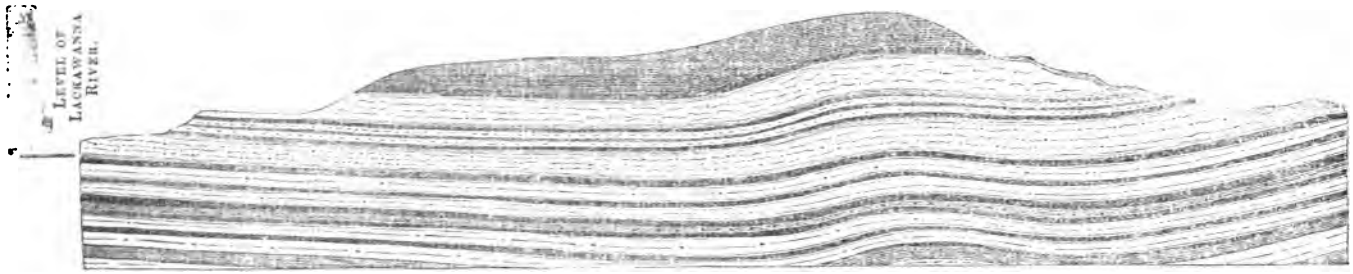
[illegible]n D from 18 to 14 feet, that is work[illegible]ether; C by itself, a[illegible] D and E will [illegible]fully compete with o[illegible] more Southe[illegible]

To *Mine Eng'r.*

TRANSVERSE SECTION,

Of a portion of the Coal Lands belonging to the "Delaware, Lackawanna and Western Rail-Road Company," known as the Griffen Lot.

By B. NEEDHAM, *Mining Engineer.*



Letter from B. NEEDHAM, ESQ., *Mining Engineer, referring to his surveys, and report upon the Company's Coal Lands, hereto annexed.*

SCRANTON, *Feb.* 20, 1854.

To GEO. D. PHELPS, ESQ.

President of D. L. & W. R. R. Co.

DEAR SIR:—Your note of the 16th came to hand only last night, after my return with Mr. Albright from a hasty visit to the various Colleries of Schuylkill Co. After a careful examination of the most approved methods of preparing Coal, I have come to the conclusion that none surpasses our own even *present* fixtures, on which we purpose making such improvements as our superior localities may demand.

* * * * * * * * *

We have procured some plain, strong machinery, for our new slopes, superior to anything I saw in Schuylkill or the Lehigh; and are making preparations to put it up in readiness for the completion of the slopes.

Taking your letter up, in the order of information asked for, I would state, that since the explorations made by Professor Rogers, whom I accompanied to the various out-crops and openings, I have taken occasion to run a line of levels on the Griffin lot, for the purpose of making a transverse section, and have concluded the borings there going on, and happily find the Coal much thicker there than its general average. I would refer you to my surveys and sections, with the estimates accompanying them, for particulars. The estimates are not overdrawn, after the deductions made; besides I have since discovered another vein three feet thick, between "A" and "B," of my last report. This is a good Coal, belonging to the upper series of veins, and not included in Prof. Rogers' reports. Leaving out those smaller veins, interesting only to the scientific, I will merely give you the general outlines of the size and quality of the workable seams on the Griffin lot. The first in the *descending* order is the "A" vein, 8 feet;—the second, a 3 feet vein;—then "B" 4 feet, where it has been worked;—"C" 5 feet—"D" 8 feet, and "E" 15 feet, making 43 feet in 6 veins, all belonging to the upper series of free burning, or Steam Coals. *All* these veins would be worked in Schuylkill, and can be worked here; but the smaller veins would cost more in proportion, per ton for mining, than the larger ones. Of the entire thickness of this upper series, 21 feet may be classed with the superior Coals for generating steam, possessing great heating powers, a very active combustion, with rectangular fracture, suiting a condensed stowage, for oceanic navigation; containing little earthy matter, and leaving a residuum of about 7 per cent. ashes. The lower series comprises five working veins, of a very dissimilar Coal. The first of this second series, the "F" vein, varies from 6 feet to 8 feet 4 inches, pure Coal, devoid of slate, of a semi-conchoidal fracture; and altogether one of the most splendid Coals sent to market: excelled only by a small vein of the Lehigh, 3 feet thick, known as the "clear vein," the heaviest and purest *known anthracite*. This vein will be mined and sent to market, for the first time, this year from this Coal-field. We hope to be ready in time to mine and send to market this year about forty thousand tons of this coal.

The next in the series is the big vein of Wilkesbarre and Pittston, varying from 9 to 18 feet. This, the "G" vein, with its usual slates, measures on the Griffin lot 18 feet, 1 inch; is a good hard firm Coal; rectangular fracture, well known in your city as the Pennsylvania Coal Co's. Then comes the "H" vein; a superior Coal, very similar in hardness, fracture and quality to the "F" vein above mentioned, and is 8 feet thick. These three veins, alone, will produce, of good merchantable Coal, on the Griffin lot, 27 feet in thickness, equal to 34,560 tons per acre, after deducting 20 per cent. for mine waste and supports. The Coal of the three above veins, "F," "G" and "H," are all of the hard variety of anthracites; excellent for foundry, furnace and

smithing purposes; and with blowers, would answer well for steam purposes. I forgot to mention that the Coals of the upper series, are excellent steam-producing Coals, *without the aid of blowers*.

Next, and last in order, are the veins "I" and "K," 6 and 4 feet respectively in thickness. They are worked at Dunmore, by the Pennslyvania Coal Company, but are inferior in quality to the veins of "F," "G" and "H," although fair merchantable Coals.

The same veins, from "B" downwards, cover, more or less of the Tripp tract, and in my first estimate of total quantities, I have no alteration to make, except to make the deductions on those reported quantities equal 20 per cent for mine waste and supports. These include slate between the strata, stumps of pillars left in "*robbing back*," and Coal dust. For variations in thickness, I would refer you to my section.

This whole mining region, above the mouth of the Lackawanna, consists of an irregular series of anticlinal and synclinal axes, with small intermediate swells and depressions; and all running diagonally across the valley: thus requiring skill and judgment in opening mines, of the most accurate kind to avoid extra expense. But the whole formation being comparatively shallow, all the Coals are easily accessible; particularly so, when compared with the extremely disrupted formation of the Schuylkill region.

We are making rapid progress with our slopes, and shall reach the "F" vein in about 44 days, being now only 18 feet above it. Our machinery is in a state of forwardness, and will be ready to operate by the middle of May at No. 2, and by the 15th of June at No. 1.

I think you may safely calculate on 140,000 tons, and reasonably on 150,000 this year. As time to meet your request is limited to a couple of hours, I have thus hastily replied to the inquiries made, and have no time left to go into more minute details.

Very respectfully, yours, &c.,

B. NEEDHAM,

Mining Engineer.

VERTICAL SECTION

Of the Coal Lands of the Delaware, Lackawanna and Western Rail-Road Company, near Scranton, Penn. by Professor H. D. Rodgers.

			5 Black slate.
			40 Coarse gray massive and shelly micaceous sandstone.
Coal M Not opened.		8 ft.	5 Fire clay.
	90		
			40 Coarse gray thickly obliquely bedded micaceous sandstone.
Coal L		3	7 Blue sandy shale. Balls of Iron Ore.
	12		5 Soft clay shale—sometimes a fire clay.
Coal K		5	8 Blue sandy micaceous slate.
	20		4 Shelly micaceous sandstone and shale.
Coal I		7	10 Slate.
	82		
Coal H		10	7 Blue clay shale—Ferns—Lepidodendra, &c.
			10 Shales.
	70		
Coal G		6	10 Slaty micaceous sandstone.
			5 Shales.
	57		
Coal F		14	2 Sandy slate.
Coal E	25	2	7 Black slate and shale.
		4	5 Micaceous flaky sandstone.
Coal D		8	5 Ore shale.
			1-4 Shale.
			12 Fire clay and shale.
	81		
Coal		2	
	6		6 Blue slate.
Coal C		6	6 Stigmaria shale.
			11 Stigmaria shale.
	31		
Coal B		4	5 Massive micaceous sandstone.
			7 Fire clay—stigmaria.
	25		
Coal		1	20 Coarse gray micaceous sandstone—lower beds pebbly.
Coal A		2	4 Blue stigmaria shale.
			14 Stigmaria shale.
	68		
	10		
			10 Stigmaria fire clay—sandy.
	80		
Base of Seral.			20 Nut and Pea Conglomerate.

EXTRACTS *from a recent Report on the* "GEOLOGY AND MINING RESOURCES" *of that part of the* LACKAWANNA COAL BASIN *which includes the lands of the* DELAWARE, LACKAWANNA AND WESTERN RAIL-ROAD COMPANY, &c. &c. *by* PROF. H. D. ROGERS, *of Boston.*

To the President of the Delaware, Lackawanna, and Western Railroad Company, and to the President of the Lackawanna Iron and Coal Company.

GENTLEMEN:—The valuable Coal and Iron Ore Estate of the Delaware, Lackawanna, and Western Rail-road, and Lackawanna Iron and Coal Company, at Scranton, a brief description of which I here propose to submit, preliminary to a more comprehensive and minute account promised for a future day, is situated in the Lackawanna Valley, South West of Cobb's and Leggett's Gaps, and East, South, and South West of the village of Hyde Park; the town of Scranton being approximately in its centre. One portion of these lands lies outside, or to the South East of the natural boundary of the Lackawanna Coal field; the other, and far more valuable part of the estate, embraces all the South Eastern side and central tracts of the Coal Basin, extending up the valley, North East, to within a mile or so of the villages of Dunmore and Providence, and in the opposite direction, South West, with some interruptions, two miles and a half from Scranton; its Northern and North-Western boundary being on the table land North of the Lackawanna meadows. The amount of productive coal lands thus situated, belonging to the two Companies, is estimated at about 3,000 acres. Before proceeding to a more special description of the *coals and ore beds* embraced within these estates, some brief preparatory general remarks on the geological features and structure of the Wyoming and Lackawanna Coal Basin seem called for, as tending the better to exhibit the relative position which the strata of this district occupy in the whole coal field.

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GENERAL STRUCTURE OF THE BASIN.

In order to convey a correct conception of the conditions under which the coal beds of the vicinity of Scranton lie, and their availability for mining, it is expedient to detain the reader a little longer from the more local descriptive details pertaining to that district, to offer a few preliminary but important remarks respecting the general geological structure of the whole coal field. He will be thus prepared to understand much more precisely the degree to which this structure affects the middle part of the Lackawanna basin, where the Scranton lands are situated, and the extent to which it influences the distribution and the mining of the coal.

In general configuration the Wyoming Basin is a wide and shallow trough, somewhat deeper in the middle than at the sides, yet deepening so gradually towards the centre, as to be, if we disregard the subordinate undulations of its strata, approximately flat. This prevailing levelness of its bed or floor, notwithstanding the considerable angles of dip,—frequently more than thirty degrees—is at once apparent when we compare the great width of the valley, —four or five miles in its middle district—within the very moderate depth of 1,200 or 1,500 feet, or perhaps 1,800 feet, which my sections seem to assign to it, in this its most capacious portion. Laborious explorations and measurements have enabled me to bring to light within the general basin the existence of a great number of nearly parallel lesser troughs or basins, with intervening saddles or anticlinal waves in the coal strata, and to trace these individually, and to develop the law of their direction and their effects on the local distribution of the beds of coal. These investigations have shown me that the

same coal seams and other strata are repeated, within certain limits, from one wave to another, so as to maintain, despite the local steepnesses of dip, this average uniformity in the depth of the coal field at any given cross section. This general levelness of the bottom is independently established by a comparison of the vertical thickness of the strata with the breadth of the valley.

The whole coal valley may be likened to a flat-bottomed boat, tapering gradually from the middle towards each extremity, and as gradually shoaling up in those directions; but the boat is not a straight one, but curves constantly, crescent-like, towards one side, and the resemblance is further deficient in the bottom not being smooth, but ridged with the waves above spoken of. This shoaling, or thinning, by superficial removal, of the coal measures, towards either end of the trough, though locally modified, within restricted limits, by the undulations, is not a uniformly progressive feature, but advances more suddenly and then more slowly along certain portions of the valley. Thus it seems to proceed rather rapidly from Wilkesbarre North Eastward past Pittston, and to be almost arrested, thence along the Lackawanna valley from near the mouth of Spring Brook, until we pass beyond Scranton, while a more rapid lifting out of the strata seems again to commence near Leggett's Gap, and to continue steadily to the termination of the basin at Carbondale. This fact of the very slow rise of the coal rocks as we ascend the Lackawanna from the Falls to a mile or more beyond Scranton, would seem, at first glance, to nearly equalize the quantity of available coal for equal areas throughout this reach of the valley; but a detailed examination of the comparative resources of the several tracts of this district will disclose quite remarkable differences, dependent on various conditions not connected merely with the depth of the coal measures. Among these modifying circumstances it will suffice for the present to advert to such as are of conspicuous importance. These are, the variations in the number, thickness, and purity of the coal beds within the same mass, or thickness of coal strata; the comparative quantities of minable coal above the beds of the ravines and valleys, the accessibleness of the coal to economic mining, and ready drainage, as affected by the direction and degree of dip of the strata, and the greater or less extent to which the strata and the seams of coal especially are obscured, preventing successful mining, or concealed altogether from discovery by the very unequal covering of drift or gravel which hides from view large patches of the coal formation in this part of the basin. So influential are these and other conditions on the productive capacity of any given tract, that it may be said that a different mining value characterizes every different half square mile of the valley, rendering it quite unsafe to infer from the ascertained geology and resources of one range of land, the commercial values of grounds adjoining, unless these have been themselves carefully and experimentally opened, and the specific relations of the unknown portions to the known, established. Circumstances seemingly the most trivial, as whether with a gentle dip the coal beds lying above the water level of a valley, incline *into* the hill or table land which bounds it, or *outwards* towards the low grounds, determining whether machinery must or need not be used, will oftentimes make a difference in the economy of mining the coal, equivalent to the whole margin of average profit to be anticipated, and, therefore, no speculative anticipations beyond very vague and general ones are to be built upon any generalizations extended to unexplored lands, from those where the geological structure, mineral contents, and mining capabilities are already ascertained.

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OF THE COAL MEASURES AND IRON ORE, STRATA, OR MINERAL RESOURCES OF THE IRON AND COAL ESTATES OF THE COMPANIES.

The Coal Measures.

It has been already stated that the coal-containing strata of the vicinity of Scranton appertain to the lower group of the white Ash Coal measures of the Anthracite basins; and it was also remarked that this group exhibits greater fluctuations in the dimensions and quality of the coal beds than any

other subdivision of the whole coal formation. These fluctuations, it is appropriate to add, belong equally, or in a greater degree, to the rocks which fill the intervals between the coal beds. It would seem as if the physical conditions under which these earliest coal strata were deposited, were more inconstant than those which belonged to the later stages of the formation. The spaces over which the nearly perfect state of repose of the surface prevailed, necessary to the accumulation by slow growth of the vegetable peaty mass producing each seam of coal, were evidently of a narrower geographical extent than afterwards; and the currents and disturbances of the earth's crust, which buried these successive peat swamps under the clayey, sandy, and even coarse gravelly strata that rest upon or between them, were obviously much more violent than in the middle and final ages of the great coal period.

Nowhere, perhaps, in the Anthracite country, are the proofs of this instability of the surface during the first stages of the coal formation more conspicuously manifested, than in the Wyoming and Lackawanna basin. Here we find, in certain neighborhoods, in the same few hundred feet thickness of these lower coal strata, as many as ten or twelve separate beds of coal, while in other localities there exists not more than half, or even a third of this number; and what is more material, the very same individual bed which in one quarter possesses an ample, or indeed superabundant thickness, is in another but a dwindled seam, too thin or too impure for profitable mining. Without attempting any close continuous tracing of the several coals, which can only be done as the consummation of an elaborate and protracted survey, I may exemplify the variability of these coal measures, by appealing to the very different types which they assume in the three meridians of Solomon's Gap, South West of Wilkesbarre; Spring Brook, South East of Pittston; and the vicinity of Scranton.

At Solomon's Gap, this group of lowest coal measures, extending from the foot of the mountain North West across the basin, to the edge of the diluvial flats of the Susquehanna, includes in a thickness of nine hundred or one thousand feet as many as thirteen beds of coal of various sizes, from one foot to nineteen feet, and the total thickness of coal, fit and unfit for mining, embraced by this section, may be estimated at nearly eighty-four feet. But out of this aggregate quantity, the thickness susceptible of being profitably wrought, does not probably amount in all to more than forty-five or fifty feet. Traced Eastward and Westward these coal beds undergo, even in the space of two or three miles, some very remarkable variations. Thus the fifth in position from the bottom, from a thickness of seventeen feet at Solomon's Gap, enlarges in that distance to the noble bulk of twenty-eight feet, opposite to Wilkesbarre, beyond which neighborhood it seems again to decline even more rapidly than towards the South West. These fluctuations arise partly through the coalescing of two or more beds into one, or conversely, through a splitting and diverging of the thicker seams into two or three thinner ones, or partly, again, by the gradual alterations of size of the same coals, independently of such unions and subdivisions.

If we turn now to the district of Spring Brook, we shall find all the features of the formation so altered as to present not one subdivision, neither coal bed nor other stratum, which we can recognize or identify as a member of the series visible in the vicinity of Solomon's Gap. In a total thickness of several hundred feet of coal measures, embraced between the outcrop of the Main Pittston Seam and the conglomerate of the mountain to the South East, only six coals in all, according to the largest estimate, have ever been brought to light, after close and persevering researches there, and only two of these appear to have a size and purity adapting them, for successful mining. There would seem to take place between Solomon's Gap, or Wilkesbarre neighborhood, and this quarter, a progressive impoverishment of these lower strata in the number and size of their included coal beds, and likewise a considerable thinning down of the entire formation. As a result, this portion of the Southern skirt of the valley maintains at this time no collieries of any magnitude.

Another and opposite change, back to a very productive condition of the

coal measures, is exhibited as we continue our progress along the same side of the basin North Eastward up the Lackawanna valley and approach the vicinity of Scranton.

In the immediate neighborhood of Scranton, a portion of the Coal Basin where the coal measures are unusually well developed by natural features in the topography, and through the researches directed by the companies,* the coal rocks, counting from the upper surface of the Seral or lower conglomerate to the highest sandstones of the plateau South West of Hyde Park Village, disclose, upon careful measurements, an aggregate thickness of about seven hundred feet; and in this depth of strata the whole number of coals, large and small, amounts to no less than twelve, not estimating as separate seams any layers which might be regarded as subdivisions of compound beds. The assembled thickness of these twelve plates of Anthracite is not less than seventy-four feet, taking for some their mean, for others their minimum, dimensions; and the thickness available for market, under judicious mining, I would estimate at thirty-nine or forty feet. These aggregates, arrived at through careful personal observation and many patient measurements, exhibit certainly an unusual amount of coal in so moderate a depth of strata, being nearly eleven feet of the former to each one hundred feet of the latter; or of good salable coal, the high proportion of six feet to every one hundred feet of rock. The immediate and encouraging inference from this incontrovertible statement of thicknesses is, that here is a tract particularly eligible for mining by perpendicular shafts or pits, since the whole body of the coal measures, possessing generally but a gentle dip, may be perforated, and the coal reached to the large amount above mentioned, by shafts descending only a few hundred feet from the surface. An inspection of the appended column of the Scranton coal measures discloses the still more interesting fact, that in a depth of no more than four hundred feet, starting with the third coal from the surface, or the five feet seam, found near the base of the hills, and ending below with the lowest included in my estimate as workable,—the six feet bed or the third up from the bottom,—the thickness of coal amounts to fifty-eight feet, of which the quantity available for mining may, at a prudent estimate, be computed to equal at least some thirty-five feet divided in seven different workable beds. These seven beds are equivalent to sustaining seven separate collieries, capable of delivering their coals to the surface through a single wide shaft, or better, through two shafts, neither of them more than four hundred feet in depth.

Of course, it must not be understood that this entire body of coal measures, nearly seven hundred feet in total thickness, underspreads the soil throughout every part of the Scranton coal field. It is only in the higher hills belonging to the North Western and Western sides of the estates that the uppermost coal beds of the group have escaped destruction by denudation, and here these seams may be advantageously entered for mining above the water level of the immediate valley of the Lackawanna. Under that drift-covered plain or valley, the highest beds yet mined, those designated I and K in the column and locally named the seven feet and the five feet coals, descend to a very moderate depth in a narrow trough near the Lackawanna; but between this belt—which is a little to the South East of the base of the Hyde Park range of bluff hills or table land, and the South Eastern edge of the basin, at the outcrop of the conglomerate—the lands contain only the middle and lower coals. The whole basin being undulated in four gentle anticlinal waves, and growing more shallow on rising towards its South Eastern side with each successive wave, these middle and lower seams, after basining between the anticlinals, crop out in their turn further and further in that direction as they are nearer the bottom of the series, until the last, lowest beds of all finally emerge to the surface in the sloping border of the valley. In the gently slanting plateau of hills North West and West of the meadows of the Lackawanna, the upper coal seams ascend with scarcely any undulations, and at a very moderate angle, above the level of the river flats, the ten feet bed, or coal H, presenting its lower, or dipward edge or outcrop, just a few feet above the plain, and giving a frontage towards the valley, extremely favorable for econo

* Skilfully and successfully conducted by Mr. B. Needham.

mical mining. A little higher in the same hills, and equally accessible, lie the seven feet and the five feet beds, or coals I and K, with courses of iron ore in large nodules. The ten feet bed, or H, reënters the ground, and maintains itself under cover throughout the wide belt which lies between the North Western edge of the plain or the Sweatland meadows, and the foot of the Scranton and Dunmore ridge. Here shafts between three hundred and four hundred feet in depth, will give access to the coal of the five principal workable beds of the series, namely, to H, G, F, D, and C, or the so-called ten, six, twelve, eight, and six feet coals; or if only the four middle larger beds should at first be aimed at, those beginning with H, and terminating with D, can be all reached by pits not deeper than about two hundred and fifty feet. This valley tract, underlaid as it is by an aggregate thickness of coal, between thirty-six and forty feet, in four beds, proved by actual mining in several localities to contain from twenty-seven to thirty feet of excellent merchantable fuel, is assuredly most advantageously circumstanced for extensive and economical mining.

I shall now proceed to give some account of the individual coal beds and layers of iron ore in the Scranton coal measures, omitting, on this occasion, any statements respecting the intervening rocks.

DESCRIPTION OF THE COAL SEAMS AND BEDS OF IRON ORE OF THE SCRANTON COAL FIELD.

Commencing with the lowest layer of coal in the series, and ascending to the highest, our enumeration will comprise, as already stated, twelve independent beds—not counting, as separate seams, certain attendant thinner bands which, in some places, coalesce with the main ones, and in others thin down and disappear, and which are generally of fluctuating size. In those cases where the beds have been opened or mined at sufficiently numerous and remote points to show their own fluctuations, if such exist, the limits and nature of these will be briefly stated. * * * *

Coal B.—This coal, measuring four feet thick at Roaring Creek, has not hitherto been mined there, partly through an impression of its unfitness, partly through the prevalence of thicker coals, adjacent to the main outlet railroad. It rests upon five feet of fire-clay, containing the rootlets of stigmaria, so characteristic of the floors of most permanent and productive coal seams. Though apparently of average purity, and of quite manageable dimensions, I do not include it at present in my estimate of the economically available beds of the Scranton estate. It has, however, been profitably mined at Dunmore, on the hill near Plane No. 6. It is there, as at Scranton, the second bed ascending. Two mine drifts, at different levels, penetrate the bed, and in these its thickness is from five and a half to six feet.

Coal C.—Next in the series is a coal called at Scranton the lower six feet bed; and it is the lowest which has been opened as yet, with a view to being mined. It crosses the valley of Roaring Creek at the Scranton Rolling Mills, but is not there wrought. Preparatory openings have been made in it a mile below the Scranton furnaces on the south side of the Lackawanna, where, like the other coals below it, it rests in a gentle Northward dip, making it accessible for mining from the river valley. This coal has been, and is now mined to some extent at Dunmore in the same hill of Plane No. 6, where the other subjacent beds are wrought near it, and in that locality it is about five feet thick. Near Scranton it rests on stigmaria shale, and is separated by six feet of that material from a band of coal, two feet in thickness, which does not everywhere follow it. Neither this coal seam nor those beneath it rise anywhere to the surface, even on the highest uplifted anticlinal ridges, or in the deepest denuded depressions of the coal basin, between these South Eastern exposures and their North Western lines of outcrop along the opposite margin of the valley. They therefore underlie every acre of the lands of the Scranton estate embraced within the coal field. I think this coal bed may fairly be estimated to contain 7000 tons of good merchantable fuel per acre.

Coal D.—This valuable seam, called locally the eight feet bed, separated from the preceding by about ninety feet of strata, rests on a bed of coarse

fire-clay and stigmaria shale twelve feet in thickness. The main bed, fully eight feet thick, is overlaid on Roaring Creek by another seam often itself four feet in size: but this rider appears not to be always present. They are separated by a layer of shale varying from one to four feet in thickness. Coal is taken from the main seam on the North side of Roaring Creek above the Scranton furnaces. The bed has also been opened and a mine commenced in it at the base of the bluff or plateau on the Griffin farm on the North side of the Lackawanna, one and a half miles South West of Scranton. More centrally in the coal field, this seam is lifted high above the water level of the plain of the Lackawanna, on both flanks of the Dunmore anticlinal. Descending with a gentle North dip from its Southern outcrop, and making its first basin in the valley of Roaring Creek, just above the level of the stream between the furnaces and the rolling mills, it rises in the Scranton and Dunmore spur, arching under the surface near the first named town, but coming out to the day and thereby separating into two outcrops, with the eastward lifting of this saddle in its course towards Dunmore. In the vicinity of this latter village, it is the highest of the coals mined on the hill North West of Plane No. 6. On the opposite or North Western side of the Lackawanna valley, the outcrop of the coal bed may be seen on the Leggett's Gap road, near which it is also mined, and it has been opened in one or two other places, just at the foot of the mountain, along this border of the basin. In a section or transverse belt passing through Scranton, this seam nowhere rises out to the surface or water level of the Lackawanna valley, but maintains itself under cover, even on the backs of the anticlinal undulation, and this is apparently its position until we approach at least the meridian of the village of Providence. It therefore underlies, as do the coals below it, the whole coal field of the Scranton property, if we except merely the strip between its South Eastern outcrop and the conglomerate boundary, and also a narrow, wedge-shaped tract, between its two inner outcrops on the back of the Dunmore anticlinal spur. Estimating this excellent bed of coal as possessing, on an average, a six feet thickness of good fuel,—and this much the mine at Roaring Creek seems to indicate, without counting upon anything from the rider or companion bed above it,—each acre of the property embracing it will contain 10,000 tons.

Coal E.—Above the last named important bed, at an interval of about eleven feet on Roaring Creek, there lies a smaller seam only two feet in thickness, and not capacious enough to be mined. It is immediately underlaid by the usual floor of stigmaria shale, which in this instance contains very large, irregularly spherical lumps of clay iron ore, or argillaceous carbonate of iron, scattered through it. This bed of shale is one of the chief horizons for this district of the nodular variety of iron ore so characteristic of the coal measures generally. The coal bed is not included in my estimate of the available mineral wealth of the basin.

Coal F.—This is called in the district the Big vein of Scranton, or the fourteen feet coal. On Roaring Creek it is separated from the small bed E below it, by from seven to twelve feet of black slate, shale and micaceous shaly sandstone, the variable thickness and composition of which imply that the lesser coal may in some localities approach the greater so closely as to constitute a lower bench of this, and thus augment its thickness. At the Furnaces on Roaring Creek, where the large seam makes its most Southern flat and gentle basin just at the water level of the stream, its size is about twelve feet, and its yield of good coal is not more than seven and a half feet; but at the base of the hill of the Griffin farm, near the edge of the Lackawanna, its thickness is almost fifteen feet, and the newly opened mine there promises to produce from this some ten or twelve feet of excellent marketable coal. North of Scranton, where the anticlinal next North of the main Dunmore axis brings it to the surface on Pine Brook, it is successfully mined from the water level gently upward towards the South in the Sandbank mine, and here the bed is of its average thickness of fourteen feet, and yields of good coal, some benches of which are of very superior quality, a thickness of eleven feet. This seam is mined to a limited extent at Leggett's Gap on a gentle South dip in the ravine below the railroad. It is there twelve feet in thick-

seen. We thus see that it spreads widely underneath the Scranton section of the basin. It is, however, like all the coals, lifted and depressed in the undulations which traverse the coal field, and is even brought to the surface and washed off from the higher crests of one or two of the anticlinals. Thus the Dunmore or main Scranton axis lifts it out into two outcrops, the Northern one ranging Eastward from the Odd Fellows' Hall, at Scranton, towards Dunmore. Spreading largely under the long, gentle Northern slope of the Dunmore anticlinal ridge, it seems to reäpproach the surface, and even to crop out above its base Eastward of Scranton, by a second upward wave, the same with that of the arch on the Lackawanna, West of the town. After being thus brought easily accessible for mining, it reënters the hill a little lower down, basins gently, and again reäppears on a fourth outcrop on Pine Brook at the Sandbank mine. Then a little further it spans flatly its third undulation, and goes beneath the flats of the Lackawanna, on the Sweatland meadows, and makes a very wide basin, with only one quite gentle anticlinal wave in it, which barely brings up to the surface the coal H, two coals above this, and leaves this larger bed, at a depth still of nearly one hundred and thirty feet in the shallowest parts of this, its main central trough. From this description it must appear that a large portion of the Scranton coal estate is underlaid by this important coal seam. From twelve to fifteen thousand tons per acre of all the lands underlaid by this bed of coal, may be fairly counted upon as its net product in merchantable fuel. A more detailed examination than it has yet received, is required to determine with precision the number of acres which it occupies.

Coal G.—Between fifty-five and sixty feet above the preceding, lies the coal, often called at Scranton the upper six feet bed. It rests on clay shale, and is overlaid by micaceous sandstone. On the South side of the coal field, this seam has its Southern outcrop at the village of the operatives, just South of Roaring Creek, the valley of which stream it does not ascend Eastward quite as far as the Furnaces, but occupies this flat basin Westward from thence along the Roaring Creek and Lackawanna, as far as the synclinal structure extends, or to where the trough entirely flattens out. This state of things occurs East of the bluff hill of the Griffin farm, at the base of which this coal is entered by a drift preparatory to its being mined there. It is lifted out or washed away on the back of the main Scranton or Dunmore anticlinal, on the North dip of which it reënters the ground at the North base of the ridge on which is seated the Odd Fellows' Hall. From this locality we may trace the line of outcrop Eastward, obliquely ascending the North flank of the ridge towards Dunmore, but how far has not yet been determined. The next anticlinals to the North, which barely lift the underlying large or fourteen feet bed to the surface, throw this seam out over a belt of some breadth, till it reënters the ground again on a North dip, North of Pine Brook. In this position we may see it at the plank road bridge over the Lackawanna, and further Eastward on the road between Dunmore and Providence. Opposite Scranton, and more to the Westward, these anticlinals do not bring it to the surface, for it is, at the least, one hundred and ten feet below the bed of the Lackawanna in the highest part of the second undulation, at the arch of the coals I and K in the bluff by the river side a little West of the town. Between its line of outcrop, near Pine Brook and the Northern margin of the basin, we have no evidence of its reäppearance at the surface, though this Northern side of the coal field is too much obscured by the general covering of drift gravel to enable us at present, in the absence of extensive mining there, to ascertain the undulations which may affect it. It is mined in Leggett's Gap at the foot of the Northern mountain limit of the basin, but this is to a very trivial extent at present. The bed of coal before us has not hitherto been mined on the Scranton lands, but merely opened and well proved preparatory to mining. Other larger and equally accessible seams have been entered and wrought in preference, as promising a larger product with a given amount of labor; and the yet incomplete condition of some of the outlets to market prohibiting that active and general working of this coal field, for which, in many respects, it is admirably adapted by the accessibility, the size and the general excellent quality of its beds of Anthracite, none but the

very best beds are wrought. This coal seam may be safely estimated as capable of affording, of good coal, some five thousand tons per acre, for every acre it occupies on these estates.

Coal H.—This is the ten feet seam, so called, and its prevailing thickness, wherever it has been mined or even proved, in the Scranton coal field, justifies the title. Its position in the strata is about seventy feet higher than the bed G above described. It reposes on a thick bed of clay shale, with rootlets of stigmaria, and is covered by a thinner layer of a more sandy variety of the same blue rock, containing beautifully preserved ferns, lepidodendra, &c. The comparatively shallow basin of Roaring Creek between the Southern edge of the whole coal field and the main Scranton anticlinal, does not retain any portion of this layer of coal, nor, of course, of any of those still higher than it in the series. To the Westward of Scranton, however, this coal has its most Southern outcrop in what may be regarded as the prolongation of this basin, in the bluff hill of the Griffin farm on the North side of the Lackawanna, where the synclinal flexure has flattened out, and given place to only a very gentle general North dip. At Scranton, and Eastward from it, the first outcrop is North of the ridge or main anticlinal undulation of the strata, somewhere under the deep covering of drift upon which the town is built. From this position the edge of this coal must curve round Southward in advancing Westward, until, lapping over the anticlinal, which ranges under the town, it must bury itself under cover; thence to the Westward, even on the back of the anticlinal. Thus at the bluff, on the West side of the Lackawanna, the coal I, or seven feet seam, already spoken of as being there visible in a regular arch, is no more than about twenty-five feet above the water level, whereas the least space dividing it from the underlying coal H in this vicinity is not less than seventy-two feet, which places the coal we are now considering nearly fifty feet below the bed of the Lackawanna at this spot. The third anticlinal undulation, counting Northward, or that which ranges just South of the brow of the table land of Hyde Park Village, and through the Sweatland meadows, South of the base of the same range of heights further East, brings this coal into view at the base of the hills, where they make a concave sweep. Lying at some depth below the surface all along the North bank of the Lackawanna above the railroad bridge, where the next higher bed, the seven feet seam or coal I, is itself only at the water's edge in several places, it presently comes up to the level of the meadow, makes a gentle arch from a South to a very flat North dip, and goes under cover at the base of the line of hills bounding the meadow on the North West. Here at the Western end of the low grounds in the Sweatland mine, so called, the coal at a little distance North of its outcrop, basins, but with an extremely gentle curve, and soon reascends again very gradually Northward, outcropping on this last rise, by denudation, at the foot of the high grounds or margin of the flats, and presenting a long line of frontage towards the valley exceedingly favorable for mining. It is here that the Company has established one of its best collieries. From this line, the lower or valley outcrop slowly sweeps itself Eastward and Northward, rising very gradually forward in the direction of Leggett's Gap, crossing in its course the plank road, a little West of the toll gate, and approaching the Leggett's Gap railroad somewhere near the long trussel work. Of the upper and final Northern outcrop of this wide, gently sloping plate of the coal, of the Northern side of the basin, almost nothing is at present known, so generally is the surface here concealed by drift. In my estimate of the aggregate thickness of good merchantable coal in the coal field, the average yield of the bed under consideration was set down at seven feet. This seam, the usual thickness of which is very nearly ten feet, contains more than the ordinary proportion of good fuel, and hitherto the colliers have usually extracted, I believe, nine feet of it for the market. One layer of it, amounting to sometimes one and a half feet of this thickness, is a rough but pure coal, and perhaps it has been injudicious to include this with the rest, which is a brilliant and excellent coal, of a large, square fracture, and of great heating power. The area occupied by this coal seam on these estates, both beneath and above the water level of the Lackawanna flats, amounts itself to a noble coal field,

but its precise extent in acres I am not prepared to report, in the absence of the requisite detailed surveys and a special geographical map, defining the outcrops of the individual beds. Each acre may be fairly estimated to contain of good coal some twelve thousand tons.

Coal I and K.—The principal central outcrop of these beds, which are sometimes called at Scranton the upper seven feet and five feet seams, is in the Southern face of the Hyde Park table lands, or range of high grounds about midway above their base. In this position they are seen on the road leading up the slope from the Lackawanna into the village of Hyde Park, and we may trace them Eastward along the escarpment, following nearly the level of the Leggett's Gap railroad to near the intersection of this with the turnpike road leading to Providence. In this vicinity the margin of the coal seams swings away more to the North, maintaining a course approximately parallel with that of the lower outcrop of coal H, but at a higher level in the hills and further to the North West from the railroad. Only in one short part of their course do the outcrops lie below the railroad, and this is a little Westward of the coal breaker of the mine connected with coal H, where a fault or simple dislocation, to the extent of a few feet of vertical displacement, has cast down the strata from a level of a few feet above, to one as much below the railroad track. Along this line of front, these coals present the same unusual facility of access for mining above the water level, which belongs to the valuable ten feet bed beneath them, and from which they are here separated by about eighty-five or ninety feet of strata, a very gentle dip Southward towards the valley, and a long ascending breast between the upper outcrops offering all the conditions for an excellent colliery or collieries.

There is another much narrower basin of the coal I, and of the overlying seam, coal K, which are only some twenty feet apart. This occupies a more Southern position in the valley. The middle of the trough ranges nearly with the course of the Lackawanna, past the railroad and carriage road bridges to the sudden elbow of the river, a few hundred yards West of the latter. Along this undulation, the coal I or seven feet bed lies but a small depth below the level of the stream, and at a distance of a few hundred yards above, or East of the railroad bridge, it emerges from the water level on both sides of the river: being on the North bank overlaid by the bed K, which has there been opened by a mine drift to a limited extent. This basin of these coals has on its Southern side the second anticlinal, or that which passes under the gravel plain of the town of Scranton, and is exposed in the flat arch below the bend of the Lackawanna, and on its Northern side it is bounded by the third axis, or that of the Sweatland meadow. The depressed arch just spoken of, lifts these coals over a space of a few hundred feet, for a small height above the level of the stream, permitting them to be readily identified. Still further to the South West, both of these seams of coal have been recognized and opened, preparatory to mining in the hill on the Griffin farm, overlooking the flats of the Lackawanna, and again in the ravine or dell which ascends through this plateau toward the turnpike road. In this vicinity, the coal I measures nearly eight feet in thickness, while the bed K is apparently a little thinner than it is to the East of Hyde Park.

Coal L.—Above the coal K, there is generally, at a somewhat variable distance, averaging twelve feet on the Leggett's Gap railroad, a thinner bed of coal, called L in our column, the size of which fluctuates from two to three and one-half feet. This has nowhere been detected in sufficient thickness and purity to be profitably mined.

Workable beds of iron ore very usually attend both of the last named beds; these will be mentioned again under the head of the Iron Ores of the District.

As neither the bed I nor the bed K has hitherto been wrought on to any extent beyond a drift or two near the railroad, East of Hyde Park, it is impossible to state from observation the positive average net yield of those seams in this vicinity. From the indications they present at their outcrops, and in the one or two accessible drifts already carried into them, it will be safe, I think, to estimate the capacity of the lower or seventh seam, at not

less than some 7000 tons to each acre, while the upper bed, or coal K, may be set down as yielding in its best localities, perhaps 4000 tons for the same superficial measure.

Coal M.—This highest coal bed of the Scranton Series is to be met with on the Griffin farm, about a mile West of Hyde Park, where it outcrops a little way below the brow of the upper plateau, only a few hundred feet South of the turnpike road, with a very flat dip towards the North. This is the only spot in this belt of high ground where it has been opened or proved, and as the old drift here visible was made several years ago, and is at present inaccessible, I have no personal observation to guide me in regard to the thickness of the coal beyond the bench caused by its outcrop, and the apparent size of the drift. From these I see no reason to doubt the accuracy of the statements given by the farmers of the neighborhood, that when the mine mouth was clear, the coal measured some eight feet in thickness. The extent of this upper bed within the property cannot be considerable, since only the higher parts and most synclinal or trough-like dipping summits of the table land can contain it.

In reviewing the foregoing descriptions in detail of the coal seams comprised within the Scranton property, it will be seen that the general summary given in the earlier pages of this Report, to the effect, that in a depth of no more than four hundred feet of strata, the net thickness of coal available for market exceeds some thirty-five feet, is here abundantly confirmed. But to bring out in a clearer light the remarkable productiveness of this portion of the lower coal measures as they present themselves near Scranton, I will assemble in a tabular form. the actual least thicknesses of the several coals within this bulk of strata, their net thickness of good coal fit for market, and the computed yield of such coal per acre from each bed.

TABLE.

Coals.	Least thicknesses.	Good coal.	Yield of good coal per acre.
K.	5 feet.	3 feet.	4,000 tons.
I.	7 "	4 1-2 "	7,000 "
H.	10 "	7 1-2 "	12 000 "
G.	6 "	3 "	5,000 "
F.	12 "	9 "	15,000 "
D.	8 "	6 "	10,000 "
C.	6 "	4 1-2 "	7,000 "
	54 feet.	37 1-2 feet.	60,000 tons.

These totals hold good, of course, only for those portions of the coal field which are underlaid by all the seven coals enumerated. If we wish to aggregate the gross amount, the net amount, and the amount per acre, contained in the four middle beds, D, F, G, and H, which lies within a thickness of strata of two hundred feet, and spread beneath every acre of the coal field, excepting only a narrow belt along its Southern border, we shall find, on summing up the columns of the Table, that the least total thickness of these coals is thirty-six feet; their yield in thickness of good coal, upwards of twenty-five feet; and their productiveness per acre, the noble ratio of 42,000 tons. * * * * * * * *

CHARACTERS AND QUALITY OF THE SCRANTON COALS.

A series of systematically conducted chemical examinations, for which I have not found leisure, is needed to enable me to determine with perfect precision the constitution of the coals of the Scranton coal field, and the relations they bear to the coals of other districts of the Anthracite region. But a careful study of their external physical structure, and of their behavior under different circumstances of combustion, and some approximate analysis made with a view to the main question of their general purity, have supplied me with such satisfactory and positive results, as will, I trust, meet all the requirements of a preliminary description like the present.

As a group, these Scranton coals are to be classed with the free-burning, white ash Anthracite, a very valuable variety, uniting the strength, or great *heating power* for which the true Anthracites are pre-eminent, with that readiness of kindling and activity of combustion which distinguish the firmer semi-Anthracites, and which the densest and hardest coals do not possess. Both in structure and composition the more ignitrble of these coals hold a station apparently intermediate between the most compact Anthracites nearly destitute of inflammable gases, and those more fissured and lighter varieties containing a notable amount of the carburetted hydrogen gases, and which I have elsewhere denominated the semi-Anthracites.* While the dryest and densest Anthracites include about three per cent. of their weight of inflammable gases, and the semi Anthracite some seven or eight per cent., these Lackawanna coals, on the verge, as it were, of the class of Anthracites or flameless coals, possess an average as much as five per cent. of these free-burning elements. And so, again, in respect to the structure of these coals. In the hardest and dryest Anthracites, the beds are imperfectly and irregularly jointed, the fissures being few and wide apart; and on the other hand, in the semi-Anthracites, these crevices are parallel and very close together, averaging two or three in an inch; but in this group of the less dense and quicker kindling Anthracites, the joints, though regular and parallel, are intermediate in degree of frequency, not occurring oftener than once in every two or three or four inches. As a large proportion of these natural fissures commence and end within the same band, they permit the coal to be hewed and transported in chunks as massive and as solid as need be desired, while they impart to the coal, when intentionally broken up, a prevalence of the square or cubical shape. This feature seems to be attended with at least two decided advantages: one is, that it assists materially the closer stowage of the fuel, an element of much importance in ocean navigation; and the other is, that it facilitates the kindling and ready burning of the coal, by the multiplicity and sharpness of the corners and edges exposed to the heat and the current of air during combustion.

In point of purity or freedom from earthy matter, these coals of the vicinity of Scranton will compare favorably with the beds of the corresponding lower white ash group of the Lackawanna and Wyoming basin generally, and indeed, with the better class of Anthracites anywhere throughout the coal region. Analysis shows that the portions which are mined for transportation, contain not more than six or eight per cent. of ashes, and this, it is well known, is a low proportion for merchantable Anthracite coals. The earthy residue of these coals, being of the kind called white ashes, consisting chiefly of silica and alumina, and containing but little alkali, lime, or oxide of iron, and being capable therefore of withstanding a high heat without melting, or more than softening into a spongy cinder, are exempt from the serious defect of producing the hard, stony clinker caused generally by the red ash, and often by the so-called grey ash Anthracites.

The proportion of solid carbon—the amount of which in coals, from the best practical researches on fuel, must be accepted as very nearly the measure of their absolute heating strength—is, in the instance of these Scranton Anthracites, about eighty-seven to eighty-eight per cent. of the whole mass, a ratio only about two per cent. less than distinguishes the dryest or least gaseous varieties in the Lehigh coal fields, while the difference is amply compensated for in the gain of this amount of ignitable, inflammable gases—hydrogen and carburetted hydrogen,—which serve materially to increase the promptness of kindling, and rapidity of burning, or the total amount of heat evolved in a given time.

These Scranton coals, in their comparative purity or freedom from earthy matters, and large amount of carbon, in their possession of a moderate density and some free inflammable gas, and in their square mode of fracture, combine in a high degree the three chief essential attributes of a superior fuel, namely, great absolute heating strength, quick ignitability or activity of combustion, and the power of packing closely. Other coals may surpass them in some one

* See an Essay on the combustible qualities of the semi-Anthracites of the Shamokin coal field.

of these qualifications to a small extent, but I doubt if, on a fair experimental comparison of properties, any will be found to combine a larger total of efficiency in all these several ways.

With a view to exhibit more distinctly the excellences of the class of free-burning white ash Anthracites, such as these I have above described, I will conclude this Essay with a condensed survey of the principal qualities essential to a good fuel for producing steam, or for domestic uses:—

1. It should possess great actual heating power.
2. As far as consistent with the foregoing, it should kindle quickly, and burn fast, generating the largest amount of heat in the shortest time.
3. Its earthy matter should be small in quantity, and difficult to fuse; it will thus make little clinker, demand but little raking of its fires, and undergo but little waste in consequence.
4. It should contain but little sulphur.
5. The volatile ingredients of the coal should be free inflammable gases, not bituminous matters forming smoke; and they ought to be barely abundant enough to assist rapidity of combustion, as the larger the proportion of fixed carbon, the greater seems the heating power.
6. They should not be too tender on the fire, nor yet too refractory; a certain tendency to fall to pieces spontaneously while burning, but not an over amount of this, is a great desideratum, as it confers activity and steadiness of combustion; too much of it impedes combustion by increasing the friction of the air passing through the fire.
7. The lower the temperature at which an Anthracite will kindle and maintain itself burning, the more manageable, more active, and more economical will it prove.
8. The better a coal unites the tenacity necessary for economical transportation, with this medium amount of frangibility on the fire, the larger the effective result of a given quantity, from the time it leaves the mine.
9. And the greater the aggregate of positive heating power, rapidity of combustion, and compactness of stowage compatibly assembled in a coal, the nearer does it approach the ideal standard of a perfect fuel.

Respectfully submitted,

By your obedient servant,

HENRY D. ROGERS.

Boston, Jan. 21st, 1854.

Extracts from the recent Report of the SYRACUSE AND BINGHAMTON RAIL-ROAD COMPANY, *showing the importance of that road as a link in the most direct route from New-York to Lake Ontario and Canada, and as an outlet to a large market for the Company's coal.*

* * * * * * * * *

"As it has always been a desideratum to form an unbroken connection between Lake Erie and the Atlantic at the City of New-York, by the most direct route possible, two great lines of Rail-way have been constructed, at a cost, as their respective capitals now stand, of over $80,000 per mile, each, with but a single track for half the length of their lines, and these roads are not only regular dividend paying roads, one of them yielding over 10 per cent.; but their capacity is inadequate to the business for which they were designed. It will be seen that it is no less a desideratum to secure an equally direct and efficient outlet for the trade and travel of Lake Ontario, when the character of that trade is investigated.

If this can be best accomplished by a road running north and south, connecting the most important point beyond all comparison on Lake Ontario, to wit, the City of Oswego, with not only the City of New-York, but that of Philadelphia, and by the shortest distance, compatible with the geographical structure of the country, and at a cost of one-third to one-half that of any other now existing, taking its course through a country unsurpassed for cultivation, agricultural and mineral resources. Who can doubt the profitable character of the operations of such a line, or fail to see that it must ever continue to be the route for the whole chain of Lakes from Chicago to the Atlantic. Such we claim to be the central north and south line of Rail-way of which the Syracuse and Binghamton forms a link.

The existing Oswego and Syracuse Road, commencing at the City of Oswego, connects directly with our road at Syracuse, which runs thence direct to Binghampton, where it strikes the Erie Road, and will use for the present at least fifteen miles of it to the Great Bend; at that point, the Delaware, Lackawanna and Western Road begins, running south to Scranton, in the centre of the coal fields of Pennsylvania, and proceed to the water gap of the Delaware, where it unites with the New-Jersey Central, and by it connects with the City of New-York. At the Water Gap, the Delaware, Lackawanna and Western Road, will also strike the Philadelphia, Eastern and Water Gap Road leading direct to Philadelphia. To recapitulate with their respective distances:

Oswego and Syracuse Rail-Road,	35 miles.
Syracuse and Binghamton Rail-Road,	80 "
Binghamton to Scranton Coal Fields,	62 "
Scranton to New-York, via. New-Jersey Central,	125 "
Making, from Oswego to New-York,	302 "
From Oswego to Philedelphia,	323 "

It may, therefore, be regarded as a settled question, that the Syracuse and Binghamton Rail-Road will connect with lines of the same guage to New-York and Philadelphia, and effect a saving of distance from Syracuse to New-York of at least thirty miles, and a saving of about 100 miles to Philadelphia—sufficient to insure a full share of the travel going south and to New-York. All the roads above alluded to will be six feet guage roads, except the Oswego and Syracuse, which road will, beyond a question, alter its guage to correspond, as a failure to do so would force a parallel road to the same point.

RESOURCES.

We would now ask your careful attention to the commercial features bearing on our enterprise.

Before giving more detailed statistics on this subject, we will quote from a carefully prepared report, emenating from a committee composed of the most

practical men in the City of Syracuse, such as Messrs. John Wilkinson, Hiram Putnam, and others, who had this subject under consideration in 1850, which was as follows:

"Aware that the question of productiveness is, after all, the grand test with monied men in matters of this kind, your committee have given to this view of the subject their main attention, and they are most happy to announce to their fellow-citizens, that, if they are not altogether deceived, *the stock of this road, when constructed, will be found to be among the best paying stocks in the State.*

"In the first place, it will constitute one link in the great chain of rail-road communication, running from the north to the south bounds of the United States, terminating on the north at Oswego, and on the south at Mobile, and passing through a country rich in mineral and agricultural wealth, and through numerous villages, and some of the principal cities of the Union. With this constructed, there would remain about 40 miles to connect us with the rail-roads of Pennsylvania—thus giving us a direct route across the country to Philadelphia, Baltimore and Washington, and at the same time bringing us in connection with the North Branch Canals in the State of Pennsylvania.

"Such are some of the general views in regard to the proposed measure; and were there no other, could we hesitate for a moment to its adoption? But for the purpose of arriving at a certainty as to *paying* results, your committee beg leave to present the following facts:

"1st, The road is just about the right length to be profitably run. From 70 to 100 miles is about as far as a locomotive engine and cars should be run at any one time, and the distance is, therefore, the right distance for profitable and paying stock.

"2d, The coal to be transported over it from the rich mines of Pennsylvania, and the salt, gypsum, gray and water lime, flour, lumber, stock, grain and merchandise, would, of themselves, in the opinion of your committee, be quite sufficient, independent of passengers, to warrant its construction.

"First of coal. With this road constructed, coal would, to a great extent, in the article of fuel, in consequence of its cheapness, take the place of wood."

The consumption of the article of wood in this city alone for the manufacture of salt and other purposes, is estimated at 300,000 cords per annum. One ton of coal being equal to two cords of wood, which is considerably below its actual value, suppose coal should be substituted for one-half of the wood now consumed, it would require 75,000 tons to supply this market alone, which, at one dollar per ton for transportation, and which is believed to be a fair compensation, would amount to $75,000

Add one-third of that amount for supplying the steamboats on Lake Ontario, and the country west, and which would be shipped on the Erie Canal from this place for manufactures, which would spring up here and at other points, in consequence of this reduced cost of fuel, and for all other purposes, 25,000 more, it would give 25,000

Then add for return freight, salt, gypsum, lime, hydraulic cement, lumber, flour from the Oswego mills and other places, grain, neat stock, and other produce, 38,000 tons, equal to . . 75,000

Making, on all these articles alone, ... $175,000

Add to these, for merchandise to be shipped from New-York, Philadelphia, Baltimore, and other places, including cast, pig and bar iron and nails, from the mines of Pennsylvania, 25,000 tons, equal to $25.000

And it gives the gross sum of $200,000

And let it be borne in mind that these estimates are according to the present wants of the country, without taking into calculation the great increase from the increased facilities and rapid growth of the country, and it will be seen that from these sources alone the road would make rich returns to its stockholders.

But to this must be added the transportation of through and way passengers, and transportation of the mail, and which are estimated as follows, viz:

Through passengers, 200 per day, at 2c. per mile, ...	$87,640
Way passengers, 100 per day, at $1 each, ...	31,300
Transportation of the mail at $150 per mile, ...	10,500
Making, of probable rates, a grand total of	239,440
The expense of running the road, including ordinary repairs, per annum, three daily trains each way, is estimated at . . .	107,482
This being deducted, leaves a net balance of	$221,958

or about 14 per cent. for annual dividends.

We might give more from this report, characterized as it was by the experience and far-sightedness of those who prepared it.

In considering the bearing of the coal traffic on this road, on which so much reliance is placed by the committee alluded to, we are convinced that those calculations will fall very much short of the reality, and this is demonstrated by occurrences since the date of that report.

One cause of the great attraction for vessels to the Port of Oswego is the certainty of a ballast freight *up* the Lakes, on their return for the agricultural products of the West, in the shape of salt, of which over 500,000 bbls. now find their way annually to Western markets. When anthracite coal shall be added to this, it being well adapted to the purpose, the increase of vessels will keep down the rate of freight; for, like the salt, the supply may always be equal to the demand, and that demand will always increase, as the cost of transportation is low.

This is apparent, from the fact that the value of the coal in the bed is almost nominal, not exceeding ten cents per ton. By reason of the nearness of all the coal in the Lackawanna Valley to the surface, it can be delivered at the mouth of the pit, or opening in the hill sides, at a cost of 50 cents per ton, leaving all the residue of value at the market of consumption for transportation and other purposes. At that period, the southern connection, by prospective roads, existed only in imagination—it has now become a settled reality, and, of necessity, adds largely to the estimates then given. In addition to this, two problems have been definitely settled by practical experience, to wit: The adaptation of anthracite coal to the propelling of locomotives, and the manufacture of salt. Here let me remark that at this time, owing to the very prospective scarcity of wood, alluded to by that committee, wood has already doubled in price in the Syracuse market, as has the article of salt.

A manufacturer of that article, who has adopted the use of anthracite coal, now informs me that such is the saving in the use of that fuel, as compared with wood, that coal must eventually take the place of wood.

I will now add, from the first named report of our Engineer, Mr. Gilbert, the impressions forced on his mind, after turning his undivided attention to this subject during the preceding year of his connection with the work.

"The result of our surveys and estimates show that a first-class road can be constructed at a moderate expense. The deep interest which the country (through which the line passes) has taken in the project, may be judged of by the liberal subscriptions, and reasonable terms made for the right of way. In conclusion, I will briefly allude to the character and amount of business that will be accommodated by this line of road.

"The district through which the line passes, is densely settled. Several large and flourishing villages are situated upon the immediate line of road, with a surrounding country rich in agricultural and dairy products, that will compare favorably with the best portions of the State.

"It has been ascertained by careful investigation, that the adult male population that will be accommodated, is equal to 300 for each mile of road. From similar results known to hold good on other roads, we may estimate the annual income from this source at $48,000. This is assuming an average of $2 for each male inhabitant, and is much below the amount derived from the same source on the New-York and Erie Road, before it reached its Western terminus.

"The amount of tonnage estimated as way freight has been made up from the present business of the country, and without any allowance that may reasonably

ANTHRACITE COAL TRADE

OF THE UNITED STATES.

The following Table exhibits the quantity of Anthracite Coal sent to market from the different regions in Pennsylvania, from the commencement of the Trade, in 1820, to 1852, inclusive; together with the Annual Increase.

Yrs.	Sch'lkill.	Lehigh.	Lacka.	Pittst'n	Scran-ton.	Other regions	Aggreg'te	Annual Increase.	Increase in each five years.
1820	.....	365	.....	.....	.....	.....	365	.....	.....
1821	.....	1.073	.....	.....	.....	.....	1.073	.....	.....
1822	.....	2.240	.....	.....	.....	.....	2.240	.....	.....
1823	.....	5.823	.....	.....	.....	.....	5.823	.....	.....
1824	.....	9.541	.....	.....	.....	.....	9.541	.....	19.042
1825	6.500	28.393	.....	.....	.....	.....	34.893	25.352	.....
1826	16.767	31.280	.....	.....	.....	.....	48.047	13.154	.....
1827	31.360	32.074	.....	.....	.....	.....	63.434	15.837	.....
1828	47.284	30.232	.....	.....	.....	.....	77.516	14.082	.....
1829	79.973	25.110	7.000	.....	.....	.....	112.083	34.567	335.973
1830	89.984	41.750	43.000	.....	.....	.....	174.734	62.651	.....
1831	81.654	40.966	54.000	.....	.....	.....	176.820	2.086	.....
1832	209.271	70.000	84.600	.....	.....	.....	363.871	187.051	.....
1833	252.971	123.000	111.777	.....	.....	.....	487.748	123.877	.....
1834	226.692	106.244	43.700	.....	.....	.....	376.636	decrease.	1.579.809
1835	339.508	131.250	90.000	.....	.....	.....	560.758	184.122	.....
1836	432.045	148.211	103.661	.....	.....	.....	682.428	121.670	.....
1837	523.152	223.902	115.387	.....	.....	.....	881.476	199.048	.....
1838	433.875	213.615	78.207	.....	.....	.....	739.293	decrease.	.....
1839	442.608	221.025	122.300	.....	.....	11.930	819.327	80.034	3.683.282
1840	452.291	225.318	148.470	.....	.....	15.505	865.414	46.087	.....
1841	584.692	143.037	192.270	.....	.....	21.463	958.899	93.485	.....
1842	540.892	272.546	205.253	.....	.....	57.346	1.108.001	149.102	.....
1843	677.295	267.793	227.605	.....	.....	68.000	1.263.539	155.538	.....
1844	839.934	377.002	251.005	.....	.....	127.993	1.631.669	368.130	5.827.552
1845	1.083.796	429.453	273.435	.....	.....	188.401	2.023.052	391.783	.....
1846	1.237.002	523.002	320.000	.....	.....	205.075	2.343.992	320.940	.....
1847	1.583.374	643.973	388.203	.....	.....	299.302	2.982.303	638.317	.....
1848	1.652.835	680.746	437.500	.....	.....	256.627	3.089.238	106.929	.....
1849	1.605.126	801.246	454.240	.....	.....	303.736	3.242.541	153.403	13.681.132
1850	1.712.007	722.622	432.339	111.014	.....	276.339	3.254.321	11.780	.....
1851	2.184.240	989.296	472.478	316.017	.....	415.099	4.377.130	1.122.809	.....
1852	2.452.026	1 114.026	497.839	426.164	.....	439.342	4.925.695	548.565	.....
1853	.....	.....	.....	512.659	97.238	.....	.....	.....	.....