

TWENTY-THIRD

ANNUAL REPORT

OF THE

BOARD OF PUBLIC WORKS,

TO THE

GENERAL ASSEMBLY OF VIRGINIA,

WITH THE

ACCOMPANYING DOCUMENTS,

JANUARY 31, 1839.

RICHMOND:

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REPORTS

OF THE

PRINCIPAL ENGINEER.

 RICHMOND, January 30, 1839.

*To the President and Directors
of the Board of Public Works.* }

GENTLEMEN,

I have the honour to lay before you the following reports on the operations of the last year. The duties prescribed were so numerous, that, although four companies were employed in their execution, we could not even accomplish all those that you had deemed of most pressing importance.

In June, I went to the north to make arrangements in regard to the map of the improvements of Virginia, called for by an act of assembly of last session. Proof sheets have been twice forwarded to me: the last was returned to the engraver with a few corrections, and with instruction to send, as soon as printed and coloured, two hundred copies for immediate use, which I expect every moment.

I took occasion of my journey to the north, and also of a short trip to the south, to visit some of the principal improvements. Every where the utmost activity is displayed to develop the resources and extend the influence of the respective states traversed by the numerous improvements in progress. It is more particularly in the southern states that I was struck with an extent of enterprise of which the accounts which had reached me had given me but an imperfect idea. Numerous lines of rail-roads will in a few years intersect the southern states in every direction, and increase simultaneously their resources and enterprise. Six main important lines from Charleston, Augusta, Savannah, Pensacola and Mobile, by Montgomery, Alabama, New Orleans and Cincinnati, converge

towards Knoxville; and there will become tributaries of the single and unrivalled stem, which Virginia can extend toward that town: the travelling and business that may be anticipated on this main stem is incalculable.

A net revenue of 20 per cent. is the very lowest estimate I can make for this line. Accustomed as we have unfortunately been heretofore to unprofitable improvements, many will perhaps be skeptical, and deem even this anticipation exaggerated: but time will prove it to be extremely moderate.

A glance at the map will shew, that this line of rail-road will secure, besides an active interchange of commodities, nearly all the land travelling from Georgia, Florida, Alabama, Mississippi, Louisiana, Texas, Arkansas and Tennessee; while the Kanawha route will exercise its influence on the central states, Kentucky, Ohio, &c. These two lines uniting in the heart of Virginia, and connected by numerous branches to her principal towns, will undoubtedly raise her to the degree of commercial importance that belongs naturally to her central position. Let these great avenues be opened, and capital, the offspring of business, will soon find its way and accumulate in her seaports, build up her towns, and infuse new life over the whole of her territory. Then we shall see the fund of internal improvement in a prosperous and healthful condition, relieved of its charges, and amply adequate by its revenue alone, to the further prosecution of all the secondary improvements, without either loans or taxation.

NORTHWESTERN TURNPIKE.

Early in the spring, I examined this road, and particularly the work done by Crolly and M'Kewon, which I estimated conjointly with the two superintendents: our report was laid before you.

During the year the sandy hills were covered with broken slate, which incorporated with the sand, answers an excellent purpose, and has made a good smooth road of these ascents, hitherto almost impracticable in dry and warm weather. The durability of this covering remains to be tested.

The capping between Winchester and Lockhart's has been made and has absorbed all the funds appropriated for that object.

The high prices asked for by contractors on the unfinished sections of the road induced me to adopt the plan of construct-

ing them by hiring hands and overseers. The immediate effect was to lower the pretensions of contractors; and from the experiment we have made so far, I have every reason to expect that the result of the adoption of this measure will be a cheaper and better road. Considering that the scarcity and high prices of provisions would not permit to complete the turnpike last season, without causing a further enhancement of prices, and thereby greatly increasing the cost, I directed the active and intelligent superintendent of the western section, Mr. Josiah D. Willson, to open at first a road only 10 feet wide all the way, wherever the widening hereafter might not be rendered more expensive. This measure was calculated to hasten the benefits of the road, and facilitate its completion by the convenience it will afford in the transportation of supplies, a consideration of much importance, and which has had heretofore much influence on the prices asked by contractors. The road is now open clear through to Parkersburg. The portions which are yet only 10 feet wide, will be gradually widened, and in continuous sections, which will successively be put under tolls. So far they are received only from Winchester to Clarksburg.

On the subject of tolls, I beg leave to remark, that on a road, which, for some time, will bring only a limited revenue, the per centage allowed by law to toll-keepers cannot be a sufficient support for a family, and it will be almost impossible to secure respectable and permanent collectors, unless some inducement is offered to them or some additional provision made. With this view, I think it expedient to make their houses, with a very small addition to the cost, comfortable enough for the entertainment of a few travellers, an object of importance in the present unimproved state of the country, and to allow them sufficient ground for all conveniences and appendages of a dwelling house. The assessments of sites of one acre, is so frequently made at extravagant prices, that I have found it as cheap, and occasionally cheaper, to buy privately, a few acres, while it is certainly more comfortable for the toll-keeper, and indeed, is frequently indispensable to prevent the turning of gates.

I would also suggest the propriety of buying good stone quarries in the vicinity of such sections as may require a stone capping. This would be a far cheaper mode of obtaining stone, than purchases by the perch. If this could have been done between Lockhart's and Winchester, a considerable saving would have probably resulted therefrom.

The wharf at Parkersburg was finished during the year.

The Middle island bridge has been rebuilt; it was contemplated to have been made a simple bridge of two spans, and thus estimated at \$1000; but an examination of the localities convinced me that this would be unsafe; and a single span of 120 feet was determined on, which cost, together with the raising of the abutments 6 feet higher, \$2300 exclusive of roofing.

I regret that I was compelled to make a single track bridge: but the abutments were good and I thought it expedient to use them, though calculated for only one track. Though long and narrow, the bridge will stand firm.

The South branch bridge, carried away last year, and directed to be rebuilt from the proceeds of the tolls, could not be raised this year with these limited means, especially, as upon examination of the site, and of the remaining masonry, I found the difficulties of rebuilding on that site so great, and the abutments so unsafe, that I concluded to change altogether the location, and rebuild it entirely from the foundation: indeed, the falling of part of the work and subsequent demolishing of the remaining masonry, brought to light a degree of unfaithfulness in the execution that I was far from suspecting, and made me congratulate myself on the change I have adopted. The bridge will now be reduced to only two spans; the localities do not admit of more; and the difficulty and expense of founding the piers makes it cheaper to reduce their number, though with a more costly superstructure.

It was my wish to have sunk the new foundation down to the rock; but, at a depth of 14 feet, there was nothing but gravel found. The foundations of the two abutments and one pier were consequently established on substantial platforms, laid level at a safe depth on the gravel. The new masonry is several feet deeper than the old one. The two spans are each of 168 feet, with a double track. Although the funds at our disposal were evidently not sufficient for rebuilding this work, I thought it expedient to take advantage of the low stage of the water in the fall, to raise the foundations to an elevation convenient for constructing the balance at any time thereafter: otherwise, another twelve months would be lost necessarily, as, since the sinking of a deep foundation in the gravel can be done only in the fall, and time would not be left to raise the upper work the same season.

The work of the foundation has been done under the supervision of the efficient superintendent of the eastern section, Mr. N. Kuykendall.

The upper part of the foundation is laid in hydraulic lime, and rises between 3 and 5 feet above low water.

This foundation has cost	-	\$1,800
It will take to complete the bridge,	-	12,500

To which the tolls in one season are wholly inadequate: part of them must necessarily be appropriated to the keeping of the road in order: yet the bridge is indispensable; for unless the crossing of this difficult stream be secured, the travelling will pass elsewhere.

As a temporary expedient, a ferry has been established with your approbation.

The Cheat river and Valley river bridges were raised and have been used for travelling: but I was not satisfied with some part of the framing, and I directed some improvements to be made before covering the bridges. I have not received any account of what has been done since.

The whole of this road is remarkable for the expensiveness of its bridges, which must be raised to great elevations on account of the rapid and high swells of all the western rivers, and must besides, be constructed with great spans to give a free passage to the enormous trees which are brought down from their wild banks in the present uncultivated state of the country; some of these bridges cost very nearly as much as a section of road of 20 miles, without bringing any revenue: and stand, besides, much exposed to depredations. Some watch should be kept over them; but there is no authority to employ agents for the purpose.

Great difficulty in the collection of tolls has resulted from the law which regulates them according to the distance travelled. I would respectfully suggest that, in my opinion, it would be preferable that full tolls should be paid at the gates in all cases, which in almost every instance would be, it seems to me, perfectly just: for, otherwise, it must generally happen that those who are most benefitted by the road will enjoy the additional privilege of paying hardly any thing for its use.

A man for instance lives near a gate: his wagons use the road in hauling his produce and timber along the 20 free miles on which his property is situated; and yet this same individual claims not to pay for more than the distance from his house to the toll-gate, when he has, by chance, occasion to pass it, though he may go 20 miles beyond it; thus contributing nothing, in fact, towards keeping in order that road, a section of which is cut up by his wagons and which affords him and his family every convenience and comfort. Suppo-

sing him, for instance, to live 2 miles from one gate and 18 from the other, he can go 22 miles in one direction for 2 miles tolls, and 38 in the other for 18 miles tolls (according to the interpretation of the law that most people contend for); thus he has a range of 60 miles for the tolls of 20 miles, and pays less when he ought to pay more, while the regular traveller pays every 20 miles—though he has not any thing like the benefits of the road enjoyed by the resident, who has a convenient way for every purpose of his farm, whose property is enhanced manifold in value, and who generally sells his produce, in consequence of the improvement, at his very door, and at high prices. It would seem, if I am correct in my views of the matter, that a man so situated should, on the contrary, pay more than the accidental traveller.

Authority, however, might be given to the superintendents to make a contract by the year with those owners of land whose property is divided by the toll-gate, or who have frequent occasion to pass through it. This would, in some measure, diminish the disposition to turn the gates, a circumstance so common, that I apprehend it will greatly reduce the receipt of tolls; and yet, in most situations, it cannot be prevented: it is done even on the Alleghany among rocks and marshes.

Free roads, under a general road law, would be the only certain way to obviate the loss resulting from this unfair practice.

The amount remaining in the treasury will be sufficient to finish the road, with the exception of the South branch bridge.

The repairs, during the past year, were on many sections, still in the hands of contractors; and, consequently, no regular system could be adopted.

I have directed that, as the road is returned to the superintendents, it shall be divided in sections of 40 miles; each section being given in charge to 6 men, one of them acting as foreman, who are to pass constantly along it and keep it in good repair: while the road is new and liable to slips, this has appeared to me the cheapest and most efficient plan to maintain it in good order for the present.

I have heard complaints of its being too narrow: slips on the upper side, and its settling on the lower one, have often the temporary effect of reducing the width; but, when these circumstances have ceased to operate, if the shape of the road is carefully preserved, and it is not raised too much in the centre, a mistake which virtually diminishes the carriage way, it will be found generally wide enough, except in some turns, which have not been as much improved as they will be.

STAUNTON AND PARKERSBURG TURNPIKE.

The law having fixed the Dry branch gap as a point, the free road between Staunton and Buffalo gap, 9 miles 67.47 chains long, will necessarily form part of the turnpike. This section will require some improvement to bring it under the provisions of the act as regards grade and width: this may be done gradually in the way of repairs, by the superintendent after there is a full section of 20 miles opened and put under tolls.

From the Dry branch gap, the most direct course appeared to be by Hodge's draft in the Shenandoah mountain, Stuart's gap in the Bull pasture mountain, and Dinwiddie's gap in Jackson's mountain. I therefore directed Mr. J. R. Anderson, who had charge of this location, to make it by these passes; but, owing chiefly to the elevation and steepness of the Shenandoah mountain, the actual location to the Bull pasture river, was found as long that way as that formerly made by Ramsay's draft; the travelling more laborious, and the estimate cost much greater, besides the necessity of encountering, farther on, the rugged and high gap of the Jackson's mountain and some additional difficulty in the Alleghany.

These considerations united, determined me to change the whole of this location, and to carry it over the same ground, where in 1826, we had located the road: that is by Ramsay's draft in the Shenandoah mountain, and Dove's gap in the Bull pasture mountain. Besides the advantages above enumerated, resulting from the comparison of two actual locations, I was confirmed in my decision by the additional and important consideration, that thus we should cover the track of the old road made chiefly at state expense, and which, if left open, would evidently have detracted much from the revenue of the new road.

The location has been perfected from the Buffalo gap to the foot of the Bull pasture mountain, a distance of $20\frac{3}{4}$ miles, a little over three quarters of a mile of which is already made, being part of the Warm springs and Harrisonburg turnpike. The balance, very nearly 20 miles, has been put under contract for \$1100 a mile.

Beyond the Bull pasture mountain, the location has been extended to Greenbrier; but, owing to the want of funds, no work has been done or contracted for on it. For the same reason, Mr. Anderson having been withdrawn from this duty, it was not deemed of importance to continue the location farther at that time.

The location will pursue as far as Tygart's valley, pretty nearly the same track as in 1826: The reasons which determined the choice of points remaining unchanged.

Beyond Tygart's valley river, Mr. D. B. Gretter, with great diligence, explored the country as far as Parkersburg. The routes surveyed are all reckoned from Adam See's on Tygart's valley.

The 1st, strikes across the wilderness to the head of the Little Kanawha, which it pursues to Parkersburg. Length of this survey, 149 miles 61 chains.

The 2d, leaves the valley of the Kanawha at the mouth of Hughes's river, which it follows to Webb's mill; then it falls on the Kanawha again at Third run—length, 137 miles 39 chains.

The 3d, leaves the Kanawha at Haymond's salt works, (Bull town) and taking the old track, measures in length 133 miles 30 chains.

This route, though shorter by survey than the preceding, is so hilly, that the grading might make it as much as the preceding, and the quantity of bridging would be much greater.

The 4th route takes its course by Weston and unites with the Northwestern turnpike at three forks of Goose creek, 23 miles from Parkersburg; length, $127\frac{1}{2}$ miles.

The 5th, passes likewise by Weston and joins the Northwestern turnpike, west of Middle Island creek, about 50 miles from Parkersburg; length of this route about 128 miles: a section of 33 miles of this distance is only computed.

The two first routes would probably be shortened from 6 to 10 miles by an actual location, and the two last lengthened a few miles.

Thus, in point of distance, there is no decisive difference between them.

The claims of the 4th and 5th, rest chiefly on the saving of expense, the latter route including a section of 48 miles of the Northwestern turnpike, leaving only 80 to be made.

The two first present an advantage of importance, which may perhaps outweigh the consideration of cost; it is that it would open and develop the resources of a vast extent of country; bring it into cultivation and increase its capacity to contribute to the support of the commonwealth.

To decide between these two considerations, the one of expediency, the other of economy, I find truly perplexing: it depends on the object in view about which I have not been fully instructed.

If the intention of the improvement be to effect the most economical connexion with Parkersburg, I would then unhesitatingly unite the new road with the Northwestern turnpike near Middle Island creek.

But if the consideration of expediency prevail, and the benefits to be conferred to the fine but unsettled district of country lying about the Little Kanawha in the counties of Randolph, Nicholas, Braxton, Lewis and Wood, I should think it proper, on the contrary, to depart as far as possible, without too much increase of distance, from the Northwestern turnpike; and even, perhaps, to effect a connection near the West Fork of the Little Kanawha, with the Huntersville and Parkersburg road. As an offset against the greater expense of this direction, I might mention its probably superseding, for the present at least, the necessity of improving the Little Kanawha.

Having thus stated my views of the location in either case, and the decision involving a considerable difference of expenditure, which I do not feel authorized to encounter, I would respectfully beg for more explicit instructions on the subject. There is such a diversity of opinions and interests concerning the route, that very extensive surveys through this unexplored country, must necessarily precede the locations, and much expense, time and controversy will be saved by a legislative decision.

The same reasons which determined me to open the unfinished portion of the Northwestern turnpike at first 10 feet wide, will recommend the same measure with additional propriety in this case: an attempt to make it of full width at once under several contractors, while labour continues so high and scarce, would not only delay its benefits, but increase its cost considerably by the difficulty of obtaining hands and provisions, and the usual competition this difficulty produces among contractors; an evil which has been felt to a considerable extent on the Northwestern turnpike.

The law requires the grades not to exceed 4° . Although I have ever advocated the lowering of the maximum grade formerly fixed by law, still, in this instance, I would wish to be allowed some latitude beyond 4° . We have met with some few cases where this grade increased greatly the difficulties of locating and cost of making the road, and a small addition of between a quarter and a half would have been better adapted to the peculiar formation of the ridges: indeed, on the Shenandoah mountain, I found it impracticable to grade at 4°

without cutting 15 feet deep, at great expense, through its rocky top.

There are besides some considerable sections of the old road which were formerly made at $4\frac{1}{2}^{\circ}$, and might be retained; whereas 4° would require a thorough change of location and a new road.

Owing to its low grades and greater width, the turnpike itself will cost somewhat more than those previously made through the mountains of Virginia; but, on the other hand, it will have the advantage of requiring but few bridges, and those of a cheap order.

The distance from Staunton to Parkersburg will be probably between 220 and 230 miles.

EXAMINATION OF THE RIVANNA RIVER IMPROVEMENT.

I examined during the summer these works, with the president of the company, and addressed him a communication on the subject. As it has been laid before you, I will merely add here, that I did not locate the connexion of the Rivanna navigation with the James river canal, on account of the necessity of obtaining previously the views of the company in regard to the object of the connexion, whether exclusively for navigation, or to answer also as a feeder; the location being different for the two purposes. A negotiation had been opened on the subject with the James river company; but not having heard of any decision taken in the case, I have necessarily deferred the operation.

GORDONSVILLE AND ORANGE COURTHOUSE RAIL-ROAD.

An act passed April 23, 1838, directed a survey to be made from Orange courthouse, with a view to a rail-road connecting at the most convenient point with the Louisa rail-road.

The rail-road from Louisa to Gordonsville having been put under contract, previous to this survey, Mr. William B. Thompson judged very properly, that Gordonsville would be the most eligible point of connexion: a diagonal line would be more expensive, both as regards its length, and the less

favourable character of the ground, and otherwise less advantageous to the interests of both companies.

The line was carried along the *Limestone valley*, which is a well known and remarkable succession of depressions across the spurs of the Southwest mountain, forming to the eye, when elevated above the general level, the appearance of a continuous valley.

The route finally selected, and which will be better understood by reference to the map deposited in your office, than by any written description, develops a profile embracing grades from a level to 38 feet per mile. There will be two curves described with radii of 1200 feet, and all the others with 2000 feet. This is altogether a favourable route for a good rail-road location.

Estimate for the Rail-Road. Distance 10 miles 3400 feet.

Excavation and embankment,	-	-	-	42,219
Drains and culverts,	-	-	-	5,467
Superstructure,	-	-	-	43,640
Addition for depot, locomotives, burden and passenger cars,	-	-	-	23,500
Superintendence and contingencies,	-	-	-	9,214
				Total,
				\$124,000

SURVEY BY SIMMON'S GAP TO HARRISONBURG.

This was required by an act of assembly passed March 30th, 1837: the object a rail-road over the Blue Ridge.

The survey began at Gordonsville. After crossing the Southwest mountain at colonel Johnston's, and passing near Barboursville, the line reaches the waters of Pretty's creek, by which it gets to the Rivanna, and up this river and Lynch's river, to the summit of the Blue Ridge at Simmon's gap. Then down the western declivity of the ridge, crossing the Hawksbill creek and a small spur, it connects with Mr. Shaw's line on the Shenandoah at Selling's ford; distant from Gordonsville 42 miles and 640 feet.

The map, and the subjoined table, shew that the Southwest mountain can be passed at grades within the scope of locomotive power, the eastern slope being at the rate of

51½ feet per mile, and the western declivity, on the line surveyed, 84 feet per mile. These grades, however, would be obtained at considerable expense.

The three miles embracing the passage of the mountain are estimated, all included, at \$119,000. It is presumed, however, that on the western side, by inclining more to the left from the top of the mountain, and passing through an intervening ridge, either by a deep cut or a tunnel, an easier grade and a shorter line might be obtained. This remains to be tried, but enough has been done to establish the practicability of passing over this ridge by locomotive power.

Thence to the foot of the Blue Ridge the line is of easy construction. But at this point all the favourable features are at an end; and although I know but few mountains that cannot be graded for the use of locomotives, I must rank this pass among the number. It is so broken and irregular that even inclined planes for stationary engines are hardly practicable, and certainly not expedient, especially when the limited business likely to be obtained is kept in view.

The widening and capping of the well graded road which has been opened through this gap, would convert it into an excellent turnpike, and would answer a much better purpose than a very imperfect and extremely costly rail-road.

The portion of the route between Gordonsville and the Rivanna, however, is highly interesting, as regards a connexion with Charlottesville, and probably a more practicable passage over the Blue Ridge, as will be noticed in the following supplemental report:

Table of grades and distances, beginning at Gordonsville.

1 m.	720 feet,	from 12	to 39	feet per mile.	
2 "	2240 "	at	51 "	" "	
1 "	4420 "	at	84 "	" "	
1 "	2220 "	at	42½ "	" "	
1 "	3120 "	at	69 "	" "	
5 "	3200 "	from 10½	to 26 "	" "	} to the mouth of } Pretty's creek.
7 "	4640 "	at	19½ "	" "	
6 "	2720 "	from 33	to 57 "	" "	
2 "	240 "	at	90 "	" "	

Thence to the top of the gap 4 miles 680 feet, rise 1344½ feet.

Thence to Selling's ford 7 miles 2840 feet, fall 1255½ feet.

42 miles 640 feet.

SURVEY FROM CHARLOTTESVILLE TO NEWARK, AND ALSO TO GORDONSVILLE.

In consequence of a memorial addressed to the Board of public works in date of 26th of July last, by numerous citizens of Charlottesville, requesting that an examination be made of some other route for the extension of the Louisa rail-road across the Blue Ridge, than that then being surveyed through Simmon's gap, you were pleased to refer the matter to me, and to authorize the survey, provided the time necessary to its execution did not interfere with the execution of other duties called for by acts of the general assembly.

While Mr. Thompson was in that neighbourhood, I found that he could appropriate a short time to this investigation, without detriment to the other operations assigned to him. He, of course, could only make a beginning of the extensive search which must precede a decision. The following is his report on the progress, the time he had to spare allowed him to make in this business :

"Having a survey and estimate of the route from Charlottesville by the way of the Green springs to Mrs. Trevillian's near Newark, I thought it expedient, in order that the cheapest route might be ascertained, to survey some other line, that a comparison might be instituted, and a selection made. With this object in view, I surveyed two routes, one to Newark or near there, and the other directly to Gordonsville, to which point the Louisa rail-road was under contract, and in course of construction.

"That portion of the route from Charlottesville to the Merry mills is common to the three lines, to wit : a line surveyed by Mr. Gretter, under the direction of C. B. Shaw, esq., (in 1836,) *via* the Green springs to Newark, and the other two lines surveyed by myself above alluded to.

"The line after leaving Charlottesville descends to the Rivanna river at a grade of 80 feet to the mile, crosses it at an elevation of 31 feet, and is sustained upon the side of the hill to the left of the travelling road, as far as the White church, when it descends through a ravine to the Merry mills. The grades in this distance vary from 3 to 65 feet per mile, with the exception of the grade of 80 feet per mile in descending from Charlottesville to the Rivanna, and the curvatures well adapted to the locomotives.

"Thence the line to Gordonsville will continue down the Merry mills branch to near its junction with the Mechunck creek, and the Limestone valley for the remaining portion of

the route—making the distance from Charlottesville 20 miles 4800 feet.

The estimate for this distance is as follows:

Excavation and embankment, - - -	83,421
Rock blasting, - - - - -	5,233
Walling, - - - - -	3,100
Bridges and culverts, - - - - -	23,500
Superstructure, - - - - -	85,727
For motive power, coaches, cars, depots, &c., -	38,105
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	239,086
Add for superintendence, &c., 10 per cent., -	23,904
	<hr/>
Total, - - - - -	<u>\$ 263,000</u>

“The line I surveyed to Newark, after leaving the Merry mills branch, is carried upon the eastern declivity of the valley of Mechunck creek until it arrives at the summit of the ridge dividing the waters of the South Anna from those of Mechunck, and pursues about the line of the stage road upon that ridge; passing Mechanicksville, and crossing the South Anna near Michie’s mill, it continues to the eastern declivity of the ridge between the South Anna and Peter’s creek; thence leaving the travelling road to the left, the line crosses a ridge and arrives at Poor creek, the valley of which it pursues to the intersection of the Louisa rail-road between Mrs. Trevillian’s and Newark. The distance from Charlottesville by this route is 26 miles 4880 feet, and the estimate is for

Excavation and embankment, - - -	131,760
Rock blasting, - - - - -	5,233
Walling, - - - - -	3,100
Bridges and culverts, - - - - -	39,526
Superstructure, - - - - -	110,389
Motive power, coaches, cars, depots, &c., -	40,500
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	330,508
Add for superintendence, &c., 10 per cent., -	33,052
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Total, - - - - -	<u>\$ 363,560</u>

"The grades on that part of the line from the Merry mills to Newark vary from 3 to 52 feet per mile, the other grades being the same as the first route described—curves favourable.

"Mr. Shaw's line from the Merry mills to Newark is 15 miles 391 feet, which he estimates at \$12,000 per mile, which is - - - - - 180,887

"And as he did not estimate for motive power, coaches, &c. for that distance, we must add, 22,500

"Also, the distance from the Merry mills to Charlottesville, is 11 miles 1920 feet, at my estimate of \$12,406 per mile, is - 140,977

Total, - - - - - \$344,364

SUMMARY.

"Hence it appears that by assuming the *same prices*, the cost of the line which I ran from Charlottesville to Newark, 26 miles 4880 feet, is - - - - - \$363,560

The line by the Green springs to Newark, 26 miles 2311 feet, is, - - - - - 344,364

The line directly to Gordonsville, 20 miles 4800 feet, is - - - - - 263,000

"It is proper to state that estimating from Newark, the distance by Gordonsville to Charlottesville is about 30 miles 2160 feet, about 4 miles further than the other two lines, and equal to about 15 minutes in time.

"With the above data before them, those interested in the scheme can make their election.

Respectfully submitted,

WILLIAM B. THOMPSON.

"Another line remains to be examined from Charlottesville by Barboursville, which in point of expediency may have higher claims than the others; and, from what we know already of it, appears equally if not more practicable. The distance likewise would probably not differ much. After having formed a decision between these routes from Charlottesville to the Louisa rail-road, the most interesting and laborious part of the investigation, that of the crossing of the Blue Ridge, will remain to be done, if you judge proper to order it."

WINCHESTER AND MARTINSBURG TURNPIKE.

The following report is also from Mr. William B. Thompson. I concur with him in his conclusions, and will only remark that, the estimate of \$3100 per mile, is probably what the road will cost if put under contract at present, while the Winchester and Staunton turnpike is progressing; so long a line of improvement, in active course of construction, particularly under several contractors, and a limited time for its completion, will always have the effect of increasing the demand for labour and enhancing its price. But, under favourable circumstances, such as a donation on the part of the owners of land, of the stone necessary for covering, which may likely be obtained, and by hiring hands only as they can conveniently be procured, the work may cost less, though slower in its progress. It is for the company, possessed as it will be of the circumstances of time and place, to decide whether a cheap but slower course of construction, or a rapid progress and earlier benefits will be more conducive to its interests.

To C. CROZET, Esq. *Chief Engineer Va.*

“You directed me to execute the duties called for by an act of the last general assembly, which required the ‘Board of public works to employ a competent engineer to make an examination and survey of a route for a Macadamized road from Winchester to Martinsburg in the county of Berkeley, to state the probable cost of the construction of the same, its connexion with the improvements already made and in contemplation to be made, leading from Maryland and Pennsylvania in Virginia, and also the advantages in his opinion which will result to the public from its construction.’

After an examination of the country between Winchester and Martinsburg, embracing three routes between those points, I made choice of the present direct travelling road leading from Winchester through Bunkershill and Bucklestown to Martinsburg, which road, from its remarkably level surface, straightness of direction, and the abundance and contiguity of the best materials to form the metal covering, is admirably adapted to the improvement contemplated. An examination of the map and profile will shew an unusually small amount of grading necessary, preparatory to putting on the stone covering, (for which there is limestone in profusion throughout the line,) as well as the small amount of bridging required.

The cost of this improvement may be safely estimated at \$ 3100 per mile, including bridging, and the distance being 22 miles 1344 feet, gives a total of - - \$ 68,989

The grades will vary from a level to 2°.

The country traversed by this line presents to the eye the appearance of a vast and extended plane, highly interesting, as well for the improved agricultural condition of the lands bordering the road, and the air of comfortable competency pervading the dwellings of the inhabitants, as the regularity of the general surface.

The road terminating at Martinsburg will there intersect the Baltimore and Ohio rail-road which is located through the eastern part of the town, and also a rail-road from Chambersburg in Pennsylvania through Hagerstown in Maryland, to connect with the Baltimore and Ohio rail-road at Martinsburg, and by those two roads will connect with the Chesapeake and Ohio canal only $7\frac{1}{2}$ miles distant, giving to the traveller at Martinsburg the advantage of three routes to the north, and to the agriculturist a choice of three markets, Philadelphia, Baltimore, and Georgetown. This road will be a prolongation of the Valley road, now in course of construction from Winchester to Staunton, and will evidently be profitable.

Respectfully submitted,

WILLIAM B. THOMPSON."

ROANOKE, DANVILLE AND JUNCTION RAIL-ROAD.

In obedience to a resolution of the 8th of April, 1838, directing a survey to be made of the route of the Roanoke, Danville and Junction rail-road from Weldon in North Carolina, by Gaston and Danville, to the most convenient point for its connexion with the contemplated Virginia and Tennessee rail-road, through the Southwestern valley, and make report to the general assembly at its ensuing session; provided that the cost of the survey hereby authorized shall not exceed the sum of \$ 4000 :

Mr. William B. Thompson, principal assistant, was assigned this duty. His report which follows, shews that the difficulties of the route, though not so great by any means as anticipated, are yet considerable : short curves and abrupt grades

requiring stationary power are encountered; and it is not improbable that the ultimate decision of those interested in the scheme will be to effect the connexion at the Big Lick, for which the facilities are much greater.

The estimate presented by Mr. Thompson I think perfectly safe.

The survey, all included, did not cost one half of the sum allotted.

The following is the report of Mr. Thompson on this operation, together with other reports in the same quarter, which my occupations elsewhere prevented my visiting.

REPORTS

OF

WILLIAM B. THOMPSON, *Assistant Engineer.*

After conversing with the officers of the Danville, Roanoke and Junction rail-road company, and having examined the note books, maps and profiles of the survey already executed by Walter Gwynn, esq., from Weldon to Danville, which they politely placed at my disposal, I discovered that a considerable saving of expense to the state could be effected by making use of them, and especially after finding among the papers of the company a report of the above named gentleman to the president and directors of the company (which report was never published), wherein he furnishes an estimate of the cost of constructing a rail-road along the river from Weldon to Danville. He says, "with the data before me, a map and profile of the line from Weldon to Danville—with the exception of about 15 miles, and the calculations of excavations, embankments and masonry on 81 miles next to Danville, I submit with great confidence the following estimate of the cost of the rail-road: in the summary, this estimate, as will be seen below, amounts to \$1,689,600."

He then adds: a comparison of this with the ridge route described in my report of the 1st of December, 1836, exhi-