

Historic Structure Survey Report
TUNNEL
Chesapeake and Ohio Canal
Part I
Historic Data Section

by
John. F. Luzader
Historian

Paw Paw Tunnel Historic Structure Report

HISTORIC STRUCTURE SURVEY REPORT

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Introduction

The purpose of this report is to present the results of a documentary study of the history of the construction of the Paw Paw Tunnel on the Chesapeake and Ohio Canal. The information presented herein will be useful in the restoration and interpretation of this important and interesting feature.

Before relating the history of the construction of the tunnel, it would be well to call attention to the position that it occupies among the component features of the C&O Canal. While locks and aqueducts command admiration for their structural and operational excellence and because they sometimes represented at least minor triumphs over varying odds, the dams across the Potomac and more especially the Paw Paw Tunnel were outstanding examples of their particular type of architecture.

The tunnel, cut through more than 3,000 feet of rock under, by modern standards, primitive conditions, presents a story of outstanding achievement. While it is not typical of Canal structures, it does, more than any other on the C&O, capture the imagination and excite the admiration of the visitor.

The Construction of the Paw Paw Tunnel

The story of the building of the Paw Paw Tunnel is intimately tied to the history of the Canal from Dam #5 to Cumberland. In fact, it helps to illuminate the problems that attended the C&O Canal Company's efforts to carry out its program through a difficult country and in an increasingly discouraging financial climate.

Let us examine the problems that were inherent in the physical character of the country upstream of Dam #5. Topographically, the region is rough, becoming increasingly so as the upper reaches of the Potomac are approached. Precipitous cliffs and hills narrow the river valley, producing pleasing views and challenging problems. The difficulties of building a canal through this region were compounded by the absence of sufficient quantities of hard stone. The problem was foreseen as early as May 1835, by Engineer Thomas Purcell, probably the most perceptive of the Company's employees. On the 26th of that month, Purcell reported from Cumberland that he had never seen a region so "destitute of good building stone."¹ While Charles B. Fish, who had just been raised to a position equal with Purcell's and whose theories were to prevail, was more optimistic, events were to support Purcell's representation. Support for the latter's representation

¹ Records of the C&O Canal Co., National Archives, ltr. Purcell to President and Directors, May 26, 1835.

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was contained in a report of A. B. McFarland, the Superintendent of Masonry.² It is interesting to note that by the spring of 1839 Fish had reversed himself.³

The topographic conditions confronted the Canal Company with critical problems in laying out the alignment of the Canal. Purcell argued in favor of the adoption of Slackwater navigations, a position which he had taken for some time in opposition first to form [sic] President Mercer and then to Fisk.⁴ Assistant Engineer E. L. Morris urged that an earlier proposal for crossing the Potomac and running the canal along the Virginia [W. Va.] bank be considered.⁵ Various considerations, predominantly political, operated to keep the canal on the Maryland side. Because of the nature of the Maryland shore, consideration began to shift toward the feasibility of a tunnel to reduce distances occasioned by the meanderings of the river. At first, Morris suggested “Devil’s Eyebrow” region across from Doe Gully, W. Va.⁶ By the end of the year [1835] attention had shifted to the Paw Paw Bends.

In a letter to Fisk, Morris reported on the situation in the following terms:

. . . . The comparative Estimate resulted thus

Summary

| | | |
|---|---|----------------|
| Tunnel line (from departure to re-entrance) | = | \$331,606 |
| River line (between the same points) | = | <u>374,523</u> |
| Difference in favor of the Tunnel line | = | 42,917 |

I have estimated the Tunnel as arched throughout and as having a Tow Path on Brick Arches.

In my notes of the Location prepared for you I have in your behalf thus

“In the Paw Paw bends which are now entered by the line, the River after pursuing a winding course of 6 miles, hemmed in for part of the distance by naked shafitifications of Rock, returns to within 1 mile of its entrance. This circumstance, the expensive character of the excavations necessary to form the canal and the difficulty of making it at once secure against the pressure of water from within and the violent assaults of the river from without, - suggested the propriety of examining whether by a Tunnel line these difficulties might not be avoided, while at the same time distance might be avoided, while at the same time distance might be saved, the construction economical and the permanency of the works rendered certain” –

.

The results of these Estimates (keeping in view that the one for the Tunnel is based upon the most unfavourable condition Viz Arching throughout and the prices of its items extracted from an actual proposal now on file in my office made after an examination of the Ground by Mr. Montgomery who executed the

² Ibid., ltr. McFarland to Geo. Bender [Commissioner], Jan. 2, 1836.

³ Ibid., ltr. Fisk to President and Directors, May 27, 1839.

⁴ Ibid., ltr. Purcell to Bender, June 3, 1835.

⁵ Ibid., ltrs. Morris to Fisk, Aug. 1 and 3, 1835. [the original failed to insert footnote number 5 in the text; this location is an educated guess by the transcriber]

⁶ Ibid.

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Tunnel on the Danville and Pottsville R1 Rd and stands ready to take this in hand at the prices established). The distance saved, and the security of the Works if thus built, induce me after carefully examining the Ground and deliberating weighing every circumstance connected with the work, to assure the board that I deem the Estimates of the tunnel route to be ample and to recommend confidently this line for the Canal to that by the course of the River.⁷

On December 19, Fisk submitted the following report, which was to be decisive in persuading the Board of Directors to accept the Paw Paw Tunnel as a solution:

...in reference to a tunnel the upper end of which will be about ten miles below the South Branch –

| | |
|---|-----------|
| Length of Tunnel | 3000 feet |
| Do of deep cut (lessening regularly) | 1800 feet |
| Distance that will be saved very nearly | 5 miles |

The distance of the river thus cut off about 6 miles of ground difficult and expensive to make a canal over –

The tunnel line with a single opening of 24 feet at water surface including the towpath – 23 feet in the center – a semicircular arch of 12 feet radius – and towpath of 6 feet with two passing places will be not less than \$30,000 cheaper than the river line.

- Excavation mostly clay slate –

Nearly all may and probably will require to be arched with brick –

For an addition to the cost of \$60,000 it is believed that a double tunnel can be made – the two separated by a brick pier composed of arches – The two tunnel arches to be semicircular of 9 feet radius. – four foot ways, one on each side of each opening – width 15 ½ feet in the clear between the inner edges of each foot way –

The double tunnel will in time be highly preferable to the single one.⁸

One again, as he had with virtuous consistency done in the past, Fisk was sharing in the most ro-seate of dreams of the canal's future. Always deprecating the difficulties and obstacles that lay ahead, he provided the less realistic officials of the Company with arguments in support of their illusions. Once a project was undertaken and the unpleasant realities became apparent even to the most sanguinary, Fisk somehow succeeded in convincing everyone that, rather than becoming critical in their thinking, they were to congratulate themselves upon their triumphs over odds that would have dashed the dreams of lesser men. This performance was not limited to the tunnel, but was repeated on every major project with which Fish was associated. He could always be counted upon to assure officers and stockholders that they were preparing for a bright, prosperous future when trade and wealth would flow down the canal. Wright, Purcell, Morris, Cruger, and others departed, sometimes to the relief of the President and Directors, but Fisk was still there when the canal reached Cumberland, and he was still there years later.

⁷ Ibid., ltr. Morris to Fisk, November 16, 1835.

⁸ Ibid., ltr. Fisk to President and Directors, Dec. 19, 1835.

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In a sense, we should be grateful to this Connecticut Yankee. He carried high the cause of expensive, permanent construction in opposition to those who sought immediate relief in cheaper temporary expedients. The result is that more of the canal exists to be preserved and interpreted, but the price paid in time and money was disastrous for the Company.

Fisk's report was considered by the President and Board of Directors during a meeting held on December 21. Without much debate, the Board decided in favor of constructing the tunnel and directed the preparation of detailed plans.⁹ The plan and specifications were submitted by Fisk; and the Board of Directors approved them on February 10, 1836.¹⁰ Unfortunately, these have not been located.

As soon as the plans for the tunnel had been approved, the Company solicited proposals from prospective contractors.¹¹ The Canal Company's records are silent concerning the number and details of the proposals received. However, the records do indicate that during its meeting of March 15, 1836, the Board of Directors considered some that had been submitted for the tunnel and "deep cuts" that were to be excavated at the portals. From among these, the Company's officials approved that submitted by Lee Montgomery; and after providing for conditions that "shall be agreeable to the Board," a contract was authorized. The date of completion was set for July 1, 1838.¹²

Montgomery, who combined the careers of Methodist Clergyman and Contractor, had performed other work for the Canal Company; and he had some experience that qualified him for this particular task, having built a tunnel on the Dansville and Pottsville Railroad.¹³ The Reverend Mr. Montgomery had other personal qualifications that commended him to the Company. No champion of the Social Gospel, he was a tough-minded, hard-fisted gentleman, who settled personal problems by using the same force upon heads that was employed against natural obstacles. His effectiveness in coping with both endeared him with the company – although, eventually, he was to find both men and nature somewhat beyond his control.

The figure at which Montgomery took the contract for the Paw Paw work was apparently \$331,606. Although the contract has not survived, Morris' statement that Montgomery was agreeable to the estimate presented November 16, 1835, indicated that the figure was embodied in the contract.¹⁴ That this sum was unrealistically low was to be proven as the work advanced. In fact, this was the only major defect in Morris' planning.

Before proceeding with the story of the tunnel's construction, it would be well to examine the character of the work that was planned. As has been noted, no copy of the contract between the Company and Montgomery has been located. However, a useful document has been found which describes the projected construction. This was a plan prepared by Elwood Morris for Fisk, dated December 1, 1836. Morris' plan, a copy of which is attached to this report, provided for a tunnel 3,120 feet long. The arch was to be excavated in the form suggestive of a horseshoe, except for the intrusion of the towpath. The arch was to be 24 ½ feet at its highest point and have a width of 24 feet. The waterway was to be seven feet deep, leaving an elevation of 17 ½ feet in the clear

⁹ Ibid., Proceedings, President and Directors, Dec. 21, 1835.

¹⁰ Ibid., February 10, 1836.

¹¹ Ibid., Feb. 17, 1836.

¹² Ibid., March 15, 1836; March 30, 1836; April 6, 1836.

¹³ [the original has no entry for this footnote, just the number]

¹⁴ Ibid., ltr., Morris to Fisk, November 16, 1835.

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above the water's surface. The width of the waterway would be 19 feet, and the towpath occupied a shelf five feet wide. The aligned direction of the tunnel was to be North 6 degrees 30 minutes East. Thus, a boat moving upstream would enter the north portal and emerge from the southern.

In addition to the tunnel, two deep cuts, one of 888 feet at the downstream (northern) end and one of 200 feet at the opposite end, were planned. Thus, the plan provided for a total of 4,208 feet of canal; 3,120 feet of tunnel and 1,088 feet of deep cut. Morris calculated that about 82,000 cubic yards of materials would have to be excavated from the tunnel, 120,000 cubic yards from the "Lower deep cut," and 16,000 cubic yards from the "Upper deep cut," making a total of canal excavation of 210,000 cubic yards.

The excavation of the tunnel would be commenced by an immediate opening of the upper deep cut to the southern portal. Although eventual excavation of the lower deep cut and tunneling from the northern portal were planned, chief reliance was placed upon working from two shafts that were to be sunk from ravines on the hill to the tunnel line. Then, according to Morris' plan, [there] were to have been single shafts with an average diameter of 14 feet. One, 362 feet from the northern portal was to be 99 feet deep. The second, 897 feet from the same portal, was to reach a depth of 165 feet. Thus, operations would be carried on, initially, from five faces, with the number increased to six whenever the heading at the northern portal were [sic] opened.¹⁵

The type of lining for the tunnel's arch was left undetermined. Morris predicted his plan and cost estimate upon brick arching throughout the length of the tunnel. Others, including Fisk, at various times considered the feasibility of brick arching near the masonry portals. As an alternative, Morris in late 1838, suggested a nine inch arch "well packed."¹⁶

While some departures from Morris' plan were made as the work advanced, the finished product was remarkably close to that planned.

For some time, the Company seriously considered a proposal for the building of a dam downstream of the tunnel.¹⁷

The exact date on which work was begun at Paw Paw is not reflected in the Company's records. On the basis of a letter written by Montgomery to Company Commissioner George Bender, on August 26, 1837, he began operations some time during June, 1836.¹⁸ If the work was commenced at that time, the contractor must have been very energetic. Arrangements had to be made for a camp, for the manufacture of bricks, and for the collection of tools. Because of the remoteness of the site and the quantity required, Montgomery obtained a patented brick making machine from Baltimore and produced bricks locally.¹⁹

Labor problems, which were to prove almost as difficult as the engineering ones, appeared at once. The Canal Company had, from the first, experienced difficulties in securing both skilled and unskilled workers in an agricultural region with a limited labor supply. Various expedients were tried, the most important of which had been the importation of unskilled Irish immigrants and the use of skilled English and "local Dutch" (Pennsylvania and Maryland German) masons.

¹⁵ Ibid., Morris to Fisk, Plans for Contract for Tunnel at the Paw Paw Bends, Dec. 1, 1836.

¹⁶ Ibid., Morris to Fisk, Dec. 7, 1838.

¹⁷ Proceedings of the Stockholders, C&O Canal Co., Ninth Annual Report, June 12, 1837.

¹⁸ Ibid., ltr. Montgomery to Bender, Aug. 26, 1837.

¹⁹ Ibid.

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The work at the tunnel would tax the labor supply; and the type of work demanded skills which the immigrants did not possess. Montgomery believed that he needed not only men, but a particular type of labor force. Within a few months after entering upon his contract, he wrote to Fisk as follows:

I came to this place [Hancock] for the purpose of consulting with you on the subject of procuring Suitable hands for the tunnel and as you are not here I send you a statement of the conclusions I have come to on the subject. I am fully satisfied [sic] that it is next to impossible [sic] to Rais [sic] a sufficient [sic] force of good miners in the country owing to the Briskness of Business / [sic] in the different mining districts. I have therefore concluded to make an Effort to send to England for a suitable force of Miners.

I have fortunately got a first Rate man Rite [sic] from England and I think of sending him on this Buisness [sic] he is confident that if arrangements are maid [sic] for their passages he can git [sic] as menny [sic] as we want of this verry [sic] first Rate [sic] Men for the Buisness [sic] of his own acquaintance [sic] so as to leave Early in the spring now six. I think arrangements might be maid [sic] with some of our shipping Merchants so as to pay their passages on their arrival in port this will Requir [sic] a smart of money say \$1500-which amount I wish the company to advance to me for the above purposes with the understanding that it is not be [sic] Retained out of my monthly Estimates as it will keep me bessey [sic] to keep matters straight on that score you will please lay the matter before your Brd [sic] and have it arrange[d] as Early as possible as I wish as little time as possible to pass if any thing can be come I hope it will meet your approbation and to heare [sic] favourable by the next Estimate . . .²⁰

The Company was agreeable to the effort to recruit British miners; and for more than a year, Montgomery's agent was engaged in hiring and arranging transportation for their men. Although the records do not reveal the number of miners imported, the evidence indicates that they were numerous, and a number of local families with English or Welsh surnames claim descent from men who worked on the tunnel.²¹

Work on the tunnel contract continued as rapidly as men and materials became available during the latter half of 1836 and the first few months of 1837. Progress was made in excavating the upper deep cut, the least difficult of the work, and the sinking of the two shafts. These were changed from single to double, each with a diameter of eight feet, and measuring twenty-three feet from center to center. The pair nearest the northern portal eventually, reached a depth of 122 feet; the other was 188 feet deep.²²

Sometime prior to June, 1837, the Board of Directors made an inspection of the Canal and its right-of-way and reported concerning the work at Paw Paw:

.... The preparatory works at the tunnel, being deep cuts at the upper and lower points, have also been prosecuted with great spirit by the enterprising contractor

²⁰ Ibid., Montgomery to Fisk, Dec. 28, 1836.

²¹ Ninth Annual Report., C&O Canal Co., June 12, 1837.

²² Records of the C&O Canal Co., National Archives, Report of the General Committee of the Stockholders of the Chesapeake and Ohio Canal Company, Presented on the 5th day of August, 1839, and unanimously adopted by the Stockholders in General Meeting on that day, p. 16.

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who has undertaken the work. At the upper end, the deep cut is finished to the entrance of the tunnel, on which operations will immediately commence, and be conducted without cessation both day and night, the working parties being relieved every eight hours. The contractor, through an agent sent for the purpose to England, has succeeded in procuring a number of practical miners, and is in daily expectation of their arrival.

He has also commenced making bricks for the arch of the tunnel, of excellent materials, found in the immediate vicinity, and employs an approved patent machine for the purpose of tempering and moulding [sic] them. Should the Board at any time have reason to doubt the ability of the contractor to accomplish the undertaking in order that the whole line may be simultaneously opened from Cumberland to Cacapon, it will be entirely practicable to hasten the operation by a division of labor, not confined to the two extremes only, but also to operate near the center, by the means of two shafts at favorable points of depression in the mountain, the one ninety, the other two hundred and fifty feet in depth, thus employing six parties instead of two. The length of the tunnel will be one thousand yards, its breadth twenty-four feet, and its height from bottom of canal to the crown of the arch twenty-four feet. The greatest elevation of the mountain over the tunnel is nearly four hundred feet. The entire distance occupied by the deep cuts and tunnel across the neck of land is one mile, and the saving of distance by this improvement, instead of following the course of the river, is five miles, avoiding precipitous cliffs of rock, jutting into deep water, when the canal must necessarily have been made at great cost and hazard.

The material through which the excavation is to be made consists of blue slate, in elliptical strata, with very slight, if any, admixture of earth or other substance. The same formation is presented at both ends of the tunnel line, clearly indicating that no other description of rock will be encountered. This we deem a most favorable omen, as, from actual experiment, it is ascertained that a single hand can bore from seven to eight feet per day, and the blasts loosen and throw off large masses [sic], which are easily broken by the sledge, and, indeed, large quantities are removed by the common pick. The material excavated will be readily removed by means of a temporary railroad. It is believed that no danger from caving in will attend the operations on this work, as the stone lies in strata representing the segment of a circle, and forming in some degree a natural arch.²³

Having reassured itself of the wisdom of the tunnel project and the relative ease with which the work would be prosecuted, the Board continued its report reaffirming its conviction that the construction of a dam below the tunnel would be of great value, reporting:

It is proposed, near the lower end of the tunnel, to erect a dam, as a feeder from that point to Cacapon, which will produce a slack-water navigation extending above the upper line of the tunnel. We calculate on many advantages from the erection of the dam at that place. It will supersede the necessity of a feeder between that point and Cumberland, and the canal is located at an elevation which will conveniently accommodate the South Branch trade, by means of a canal on

²³ Ninth Annual Report, p. 8.

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that stream of only a mile in extent, and an aqueduct over the Potomac connecting with the main stem. We cannot for a moment doubt but that the Legislature of Virginia will furnish the means to secure this connection, so important to that fertile valley. Should unforeseen difficulties defeat our expectations of the timely completion of the tunnel, the navigation to Cumberland will be uninterrupted, as, by temporary locks at the upper end of the pool, boats may pass to and from the Canal. In addition to the above considerations in favor of the proposed location of the dam, another may be urged entitled to much weight. On the completion of the canal to Cumberland, a constant and active descending trade, from the coal region of Allegheny and the agricultural districts of the west, may be confidently relied on; and it may become the policy of the Company to use the tunnel exclusively for the descending boats, from any obstruction or delay. The pool, with the addition of a towing-path, may then be safely navigated by ascending boats, which are rarely so heavily laden as those descending; and thus at a moderate cost, every facility will be afforded which the increased trade on the canal may require.²⁴

There is a certain irony in the proposal for a dam and the arguments advanced in its support. Purcell had urged the feasibility of slackwater navigation as a means of avoiding expensive construction at the Bends. His recommendations had received shrift, and his ideas were scornfully rejected in favor of the tunnel. Now, the Board was seriously suggesting that both the tunnel and slackwater navigation be provided for. If Purcell's arguments were impractical and unrealistic before work on the tunnel was begun, they were no less so after that project was started. If they were valid and slackwater navigation were practical, the tunnel was an expensive and unnecessary adventure. The construction of a dam and towpath for slackwater navigation, in addition to the tunnel, merely added to the burgeoning costliness of the canal at Paw Paw. To plead the necessity for providing for two-way traffic was compounding the Board's silliness. Purcell's proposals would have provided for such traffic at much less cost.

The Board's defense of such a dam as a means of tapping the Virginia trade with South Branch Valley was equally difficult to accept. Construction at Dam Number 6 was planned with that trade in mind. In addition, the Board's expectations of the General Assembly of Virginia were unrealistic in view of the worsening economic situation that was leading to the financial crisis of the current year.

Once again, the Company's officials were resorting to the type of thinking that was to characterize so much of its planning and which contributed to the economic troubles that plagued the construction of the Canal. In brief, their position was that slackwater navigation was to be avoided and a tunnel was an absolute necessity; but that a dam and slackwater navigation were highly desirable to render the tunnel more useful. The end result would be not one dam, Dam Number 6, and a towpath, but two dams, an artificial canal, two deep cuts, a tunnel, and still a towpath for the slackwater. Fortunately or unfortunately, as the case may be, deepening financial difficulties prevented the Company from adding to the costliness of the construction at Paw Paw Bends.

The Directors' optimism concerning the ease and speed with which the Montgomery contract would be accomplished proved to be misplaced. While problems of ventilation and pumping for the shafts were capable of solution, they added to the expensiveness of the work.²⁵ The recruit-

²⁴ *Ibid.*, pp. 8-9.

²⁵ Records of the C&O Canal Co., National Archives, ltr., Morris to Fisk, Sept. 29, 1837.

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ment of workers from Great Britain, the cost of the brick-making machine, rising pay for workers, and mechanical difficulties were leading the contractor gradually, but certainly, toward bankruptcy,²⁶ and he began to make a request, which was to be repeated time and again with increasing urgency, for financial relief.

In late August, 1837, Montgomery wrote the following letter to George Bender, the Company's Commissioner:

George Bender, ESQ Chas. & Ohio Canal, Tunnel, Aug. 26, 1837

Commissioner.

Dear Sir,

I have taken the liberty of communicating to you and through you to your Board, a brief statement of the state and condition of the above work. It is now about 14 months since I began the excavation on the deep cuts, and finding hands very scarce, I have spared neither expense nor pains to bring to the job into favorable notice both far and near, and encourage men to come on to the work. I have made large preparations for the work, and have so far succeeded, that I now have about 250 men variously employed, some preparing stone for the portal face, some making brick for the arch, and the main force excavating the deep cuts, sinking shafts, and draining the upper end of the tunnel; and would just say that on the first of July I commenced tunneling at the south end, and have somewhat surpassed my own expectations in reference to speed; I have been able to average from ten to twelve feet per week*; and as there are four working shafts now under way, which will be completed by Christmas, which will enable us to add four fifths to the present speed of tunneling, which might be continued by sinking another pair of shafts so as to divide the distance, which would if done enable us to get through in two years or less from that time, which would perhaps give sufficient time to complete the masonry. This is the most favorable view that can be taken. I have written several letters to different gentlemen in England, who promised Mr. Evens to assist in sending out miners; so that I am satisfied that the work [will] be supplied with suitable workmen as fast as it can be got opened. I only wish to show what I think is possible to be done which is an object I have much desired to arrive at; that is, how soon it was possible to get through with the work under the most favorable circumstances.

I have just given the foregoing outline for your satisfaction, believing it will not be altogether uninteresting to you; and now I would also [say] that in the progress of the work thus far, I have exhausted all my available means in addition to the estimates you have paid me, and now I view it as a matter altogether impossible to proceed much further without an improvement in the prices of the work, as the greater the force the greater is the loss I must sustain. This fact, known more than twelve months ago, it was not only known to me but to your Engineers, also various circumstances comprise to render the work [more] difficult and expensive

²⁶ *Ibid.*, ltr., Dungan to Fisk, May 13, 1837.

* Compare this rate of speed with that of "seven to eight feet per day" for a single hand forecast by the Directors in their June report.

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than at first contemplated the facts are all known to your Engineers having therefore a desire to give them a fair opportunity of ascertaining my ability to conduct a work of this kind (as I was a stranger) as well as to afford them a fair opportunity of ascertaining the actual cost of the work I have delayed the matter until the latest moment having every confidence in your Board in reference to their disposition to sustain their contractors on whom they can rely for the completion of laying before your Board the extreme necessity I am in of having an advance of at least one half of the percentage retained on the monthly estimates which will afford a temporary relief and afford your Board time to be informed on the subject. And now dear Sir it remains for your Board to say whether I shall be sustained in this great undertaking which I am very ambitious to push to a successful close or whether I must retire disgraced and ruined.

.....

L. Montgomery²⁷

Montgomery's distress was painfully real. Every item was more expensive than either he or the Company's officials had anticipated. Although the situation began to be apparent as early as September, 1836, the optimism of all parties seem[s] to have delude[d] them into believing that all would be well. By the end of the summer of 1837, as Montgomery's letter shows, those on the scene knew that the financial situation was alarmingly bad. The Directors were less exercised. Perhaps their illusions were all that kept them going. If they had permitted themselves to see conditions in their true light, they probably would not have persevered – even to 1837.

Commissioner Bender referred Montgomery's letter to the President and Board of Directors. They, in turn, authorized the advance of \$2,500 out of the retained money and referred the matter of an increase in prices to Fisk.²⁸

The Board's advance was too small to be material help to the contractor, and his situation became progressively worse. In February, 1838, the latter wrote to Chief Engineer Fisk that he had commenced driving the tunnel from shafts 1 and 2 and had a large force working on the deep cuts, but that the entire work was jeopardized by an acute shortage of funds.²⁹

On February 15, Elwood Morris wrote the following letters to Fisk that should have shaken even that optimistic gentleman:

The period has arrived, when the contractor for the Tunnel and deep cuts at the Paw Paw Bends stands upon the brink of Insolvency.

That lamentable catastrophe with all its disastrous train of consequences can no longer be averted: the day has come when promises of favourable action at a distant period will no longer suffice, a decision the most prompt followed up by energetic action can alone prevent the casualty to which I allude.

Mr. Montgomery has lent all his energies, has sunk his private fortune and extended his credit to its final limit, for the purposes of carrying out fully the ex-

²⁷ *Ibid.*, ltr., Montgomery to Bender, Aug. 26, 1837.

²⁸ *Ibid.*, Proceeding President and Directors, Aug. 30, 1837.

²⁹ *Ibid.*, ltr., Montgomery to Fisk, February 15, 1838.

* The Assistant Engineer assigned to the Tunnel.

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pressed wishes & direct orders of the Engineer in Chief, he has since August last, increased his force of workmen & pressed the works with untiring zeal, his liabilities are enormous, his resources the most limited, in short his situation is desperate, he must either be substantially aided or he will be sacrificed.

Mr. Dungan* reports that a mob of laborers surrounded the office at the Tunnel as he passed yesterday, the Miners were threatening to quit & a rumour has this moment reached my ears that his store was some time after Mr. Dungan came by broken open & robbed & that threats were held out that they would destroy certain parts of the work. I mention this only as a rumour. I write in extreme haste to be in time for the Mail, I will address you again to-morrow.

I will merely say further that if Mr. M. appears again at his work without the pecuniary means to satisfy the just claims of his workmen for labour done, there is reason to believe that his life itself would not be safe from those exasperated men.³⁰

The picture presented by Morris was an alarming one. He was personally familiar with the conditions at Paw Paw, and he knew the causes. It is interesting to note that he sympathized with the workers. They had not been paid for almost two months; and Montgomery did not have the funds to pay even a portion of the arrears. His attitude was in sharp contrast to that displayed by the Company's officials, who in every instance of unrest, regardless of the legitimacy of the grievances, condemned the laborers for making a protest, whatever its form. As Purcell had before him, Morris was capable of understanding the plight of the men who were expected to work under dangerous, uncomfortable conditions.

Morris immediately took steps to avert the trouble that was expected at the tunnel. His action, unlike that taken by Company representatives on other occasions, did not smack of reprisals and threats. Rather, he directed his assistant, Dungan that, in the event of further trouble, he was to address the workers as follows:

Laborers & Miners

Mr. Morris the Principal Assistant Engineer, who has the control of these works, has instructed me to tell you not to be alarmed for fear you will not get the wages that are due to you.

The Canal Company have not yet paid to Mr. Montgomery any estimate for work done in January, but they will very soon do so.

They are largely indebted to him & will probably advance him a considerable amount of money.

To enable him to pay your wages, he had [sic] gone to Washington by Mr. Morris's advice to ask them to do so, he will without doubt succeed in his mission & return with money enough to settle with you all.

There may be some delay, but you will find it more to your interest to be patient & peaceable a little longer than to risk all by any hasty movements.

³⁰ Ibid., ltr., Morris to Fisk, Feb. 13, 1837.

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We advise you to go on quietly with your work until the contractor returns & all will be well.³¹

While Morris' proposed address to the workmen emphasized an expression of confidence in the outcome of Montgomery's efforts to obtain relief, his private opinion was one of justifiable doubt.³² He had reached a point where he questioned the ability of the Company to make good its promises, unless some political agency should come to the rescue. Morris also noted that the situation at the Bends was not isolated. Conditions were bad along the entire upper line of work. The financial panic of the previous year was making itself felt in western Maryland; and many merchants and other business men, as well as some contractors, were quite alarmed. Men who had been active in the earlier "Irish riots" were active among the workers; and the climate was favorable to their efforts to arouse the unpaid employees to violent action.

On February 18, Morris wrote the following letter to B. S. Pigman, the Company's counsel in Allegheny County:

Dear Sir

Owing to circumstances beyond the control of either the contractor or the Canal Company

The Chief part of the large body of workmen employed at the "Tunnel & its dependencies" (perhaps 400 hands) have not been paid for near two months. -----

Being aware of this fact & knowing how quickly persons of that class, whenever settlement is delayed, are led to doubt the ability to pay, knowing also that threats have already been made by some of the more turbulent men, that if their wages are much longer withheld, they will ruin and destroy certain parts of the work; and fearing daily (as I think on good grounds) that they may quit work riotously assemble & do some damage.

I feel it to be my duty in the absence of Major Bender & the Chief Engineer to request you as

Counsel for the Canal Company, I am receiving notice of riotous movements, to take such steps as may in your Judgment be deemed suitable for the protection of the works – The Sheriff & his Posse, perhaps the Military may be needed of which however the facts before you, you will be the best judge.

I have directed my Assistant at the Tunnel (Mr. Dungan) that if any Acts of Res't, should take place, he is forthwith to depatch [sic] a messenger to apprise you of the fact & send notice to me at Hancock.³³

Thus, Morris undertook to prevent the explosive situation at the tunnel from getting out of hand – trying to protect the Company's interests and at the same time be equitable and patient in dealing with the workmen. Fortunately for Morris, the disorder that he expected did not erupt, and his address to the workers and the provisions for coping with a riot did not need to be put to the test.

³¹ Ibid., Morris to Fisk, Feb. 14, 1838.

³² Ibid.

³³ Ibid., Copy in ltr., Morris to Fisk, Feb. 21, 1838.

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Although the laborers remained at work, problems continued to contribute to the mounting difficulties of construction. The cost of sinking the shafts proved to be substantially greater than had been expected. The same was true for the transportation of the spoil from the shafts and its distribution on the hill over the tunnel. The still unpaid hands were not working at capacity, with resultant waste of time and money.³⁴

Sufficient sums were paid to Montgomery, at the rates originally specified to permit operations to continue. The results were palliative and not corrective, because the contractor was still losing money.

On March 16, Morris reported to Fisk on the work at the tunnel, indicating that, in spite of the still unresolved troubles, progress was being made, he reported that:

I have satisfied myself on my own view that the ground in the Tunnel now opened at Shafts A & B Ravine No. 1 is at least as favourable (I think it more so) than that now working at the south Portal.

There is therefore I repeat no reason why the same amount of Materials cannot as easily be loosened by the same number of men in the shaft workings as in that at the south end: The Boss Miner himself thinks the progress of excavating should be as fast in one place as the other & he says further that when the Railways are laid both above & below ground at the shafts the transportation of the materials will be as cheap or nearly so from the Shafts in Ravine No. 1 as at the South end.

My own opinion is that the difference will be from 25¢ to 50¢ per C [cubic] yd, not less than the first nor more than the last at the same dist. in.

When I was down in the Tunnel in Ravine No. 1, the heading measured lineally including 16 ft of shafts about 80 ft.

The distance in of the heading at the North Portal (same date Mar 15th) about 360 feet total heading of Tunnel now driven near 440 ft.

At the south end at 360 ft in the air is pure & the smoke dispences [sic] quickly.

In the Tunnel at Ravine No. 1, the air is pure & has not the least unpleasant action on the lungs, but the smoke hangs & some of our plans of ventilation will soon be demanded.

On Mar 15th on all the Tunnel works they were using borrowed Powder, & the smiths were nearly out of coals; These things ought not to be so, & I hope will be altered as soon as the advanced prices are settled, it is unpleasant to see even under existing circumstances, in so great a work such a lack of that discipline, management, & prudent foresight, which are esteemed to be so necessary to the success of large undertakings.-

With regard to the workings from the shafts A & B, I have determined (if you do not otherwise instruct me on the rect. [receipt] of this letter) that if the piece of that excavation should this month exceed in any great degree that of the south end & Montgomery's prices remain unadvanced, I will stop all operations from the shafts on the 15th of April next.

³⁴ Ibid., ltr., Morris to Fisk, Mar. 13, 1838.

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If Montgomery's prices are advanced* before then or whenever they are advanced, the loss if any by the unaccountable cost of the excavation from the shafts will fall on him as it of right ought to if the management is bad.

We ought certainly not to allow it to fall on the Canal Company,

* An application for an increase in unit prices was under consideration by the Board.

when there is no apparent cause for such increase & when the inevitable conclusion to which we must come is that we have been cheated by the workmen in one way or other.-

That part of the Tunnel which is cut to Bottom, presents a beautiful appearance from about 200 ft looking outwards, the Roof of the whole work which I examined with great care is sound & solid beyond my expectations. –

That sides of all the shafts except 25 to 30 ft at the top of each are firm, free from shakes or splinters & are perfectly safe to work under; No perceptible effect of frost has been produced by the frost on the interior of the Tunnel. –

.

I have deliberately examined & reflected upon the slides at the south Portal.

I am satisfied as I have long been that we can do nothing (at any reasonable charge) to arrest them effectually. The angle of repose will be assumed along our whole Berm slope near the Tunnel by the slipping in of not exceeding 8000 C yds more, chiefly Earth.

This will make the total of slips 20,000 C yds chiefly Earth, but all danger of anything of this nature occurring in future time will then be at an end.

It seems a heavy item but we at least I have the satisfaction to know that my professional experience pointed out no means of arresting the slips without incurring greater cost than by removing the fallen materials: I have a long time since (as soon as I saw that slides would happen) of Athys hollow for about 400 ft & then begin & cut down an inclined plane, sloping at 1 in 10 to strike canal Bottom at the Portal, up this slope & up a train road we have now laid we can dispose by carts (or cars if you please) the Bottoming of the tunnel in the ravine to which the train road leads.

Present indications exhibited by the roof of the Tunnel lead me to think that we may be able to dispense with arching more than 200 ft in from each end, at least until we can bring to the spot Bricks boated on the Canal from points where the clay is of unexceptionable quality – Montgomery's success both in procuring proper clay & making good Bricks, has up to this date been most indifferent; indeed he has in the last failed most completely.-

I would therefore recommend to your consideration the propriety of notifying Montgomery to limit his Brick Making operations to the amount which may prove

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necessary to Arch 400 lineal ft of Tunnel & which amount I will furnish when required. _____³⁵

Morris' letter represented the work at the tunnel as a mixed picture made up of some progress, but attended by poor management and supervision. After approximately twenty months of work, a total of 440 lineal feet of the tunnel had been driven. Of course, the cutting of shafts and work on the deep cuts added to the total of excavation. The laying of tracks and other incidental work had been accomplished that increased the total of progress. However, Morris clearly believed that neither the contractor nor the work force had operated at anything approaching maximum capacity.

In the meantime, Montgomery's financial situation remained serious; and so long as he was to continue operations at the prices fixed in his contract bankruptcy would be the only result. On April 11, 1838, the Company's Board of Directors finally took action on the contractor's request for an increase. A committee to which the request had been referred offered the follow for consideration:

In consequence of repeated applications from the contractor & the reports of C. B. Fisk the Principal Engineer,* that the work on excavating in the Tunnel at the Paw Paw lands [sic] has proved much harder and more difficult of excavation than was calculated upon & that the work actually costs the Contractor now more than 75 pct above his contract price. It is recommended by the said Engineer to increase the price 175 cents to 3.25/100\$ per cubic yard. The Board having taken the subject into serious consideration have decided on leaving the matter with the Engineer to assess the prices upon the following terms: viz – The quality of the rock to be strictly examined as the work progresses, and in making his estimates no part of the work shall exceed 3\$ per cubic yard and none less than 175 cents, the contract price. The prices to be fixed according to the judgment of the Engineer, within the limits stated, and for the kind of work stated, from the commencement of the work.³⁶

During the discussion that followed the submission of this recommendation, Gunton one of the Directors moved that the price per cubic yard be fixed at a maximum of \$2.50. This motion was defeated, and the Board adopted the following:

The Board having taken into consideration the representations of the Engineer upon the subject of the prices at the deep cuts of the Tunnel, as exhibited in his detailed statements, of the cost of the work owing to the hardness of the rock, increased prices of labour and to the great difficulties of transportation from the locality, do agree that the Contractor shall receive on all the rock excavating 140 cents per cubic yard, but no increase for the earth excavation.

As immediate relief for the contractor, the Directors authorized an advance of \$25,000.³⁷ For a brief period, it seemed that the worst of the troubles at Paw Paw had passed; however a new threat to the prosecution of the work appeared – this time in the form of labor troubles.

³⁵ Ibid., ltr. Morris to Fisk, Mar. 16, 1838.

* Fisk's report has not been located.

³⁶ Ibid., Proceedings, President and Directors, April 11, 1838.

³⁷ Ibid., Proceedings, President and Directors, April 11, 1838.

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During the strikes of 1836, Montgomery had succeeded in preventing his employees from becoming involved, thereby winning the admiration and praise of Company officials.³⁸ However, in May and June, 1837, trouble, centered at the tunnel, did erupt. At this point, the labor unrest was united with Irish hostility to the imported English workers. A large force of the former seized control of the works and drove off all but two of the forty new immigrants. Company failure to take punitive steps contributed to the trouble, and convinced the Irishmen that they had nothing to fear, while the “native-borns” and English workers were equally convinced that they could not rely upon their employees and the Company for support.³⁹

As has been noted, riots broke out early in 1838.⁴⁰ Again, non-pay and resentment toward English and German workers cooperated in arousing the Irish laborers.⁴¹ This time, several leaders were arrested, but the rioters continued to burn shantees [sic] and to try to drive off non-striking employees. This outbreak subsided, and work was permitted to continue.

In May, 1838, general strike broke out along much of the construction line. At this instance, the cause was entirely due to the inability of the contractors to pay their hands. In spite of the fact that Montgomery had just received an advance, the trouble spread to the tunnel, where the effects of the advance had not yet begun to be felt. The Canal Company called upon the local county militias for protection of the property. The response was a reluctance to turn out. In the first place, neither the state nor the Company had paid the expenses for the last alarm. In addition, many of the local people sympathized with the workers and blamed the Company for failure to relieve the hard-pressed contractors, making the payment of wages possible.⁴² The feeling among some of the local people was so strong that they threatened to join the workers.⁴³ In spite of their sympathies, the militia did respond, moved to the canal line and seized 140 kegs of powder, which were stored at the courthouse in Hagerstown, to the alarm of the town’s inhabitants.⁴⁴

The situation remained explosive. The conditions under which the laborers lived and worked shocked local observers, even in that age when such matters received less attention than they do today.⁴⁵

The unpaid workers were determined to prevent further construction being accomplished until they were paid for the work that had been done. The Company offered to pay 25 cents on the dollar, but this was rejected by the workers. By this time, the local people’s sympathies were so favorable to the laborers that they, assuring the latter of the correctness of their stand, advanced credit for supplies and provisions.⁴⁶

For the most part, the workers were quiet in their determination to obtain redress for their grievance concerning nonpayment of wages. While some work continued to be done, construction on most of the sections under contract was practically suspended.

³⁸ *Ibid.*, ltr., Bender to Engle, May 8, 1836.

³⁹ *Ibid.*, ltr., Fisk to Bender, May 15, 1837; Fisk to President and Directors, June 23, 1827.

⁴⁰ *Supra.*, pp. [no page numbers were recorded in the footnote.]

⁴¹ *Records, C&O Canal Company*, ltr., Fisk to President George C. Washington, Feb. 5, 1838.

⁴² *Ibid.*, ltr., Wm. Price to Washington, May 11, 1838.

⁴³ *Ibid.*, ltr., Otho H. Williams, Jr. to President George C. Washington, May 16, 1838.

⁴⁴ *Ibid.*, ltr., Williams to Washington, May 17 and 18, 1838.

⁴⁵ *Ibid.*, Williams to Washington, May 16, 1838.

⁴⁶ *Ibid.*, Fisk to Ingle, May 19, 1838; Williams to Washington, May 24, 1838; William Price to Washington, May 11, 1838.

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After a period of quiet, rioting broke out at the tunnel in the latter part of June, the contractor was authorized to discharge all hands and to suspend construction.⁴⁷ This was followed by the preparation of a “black-list” of disorderly persons. As a result, action was taken on August 1 to discharge about 130 men, a majority of whom had been employed at Paw Paw.⁴⁸ The Company had a great deal of faith in the effectiveness of the “black-list”, and its action has been cited as resulting in alleviating the labor situation. There is room for skepticism.

The “black-list” and employment of labor spies were deeply resented by the workers and the local public, who felt that much of the blame for the strikes rested with the administration of the Canal Company. That the situation was exploited by the opponents of the Canal does not alter the fact that the financial distress of contractors, and in turn, laborers was the primary cause of the disturbances. That so large a portion of the local population was sympathetic to the laborers is illuminating.

The feeling of the natives toward the workers had not been especially friendly, and cholera epidemics and earlier “Irish riots” had made the laborers more unpopular. The newly sympathetic attitude that obtained in mid-1838 indicates that the workers had some very real grievances and were justified in their efforts to obtain redress.

While the unsettled labor situation was threatening the continued construction work, the tunnel contractor was again seeking action by the Canal Company that would permit him to pay his hands, continue his work, and prevent his becoming bankrupt in the execution of his contract. The relief that had been granted earlier in the year had failed to do much more than meet his arrears in pay and continue the minimum of work. Early in July, he requested the Company to pay him half of the “retained money” that had been withheld and “that the work . . . be estimated by a scale of prices having regard to the relative cost of the different kinds of excavating of Rock.”⁴⁹ Fisk also wrote to the President and Directors recommending that Montgomery be permitted to surrender that part of his contract concerned with the excavation of lower deep cut, the more difficult of the two excavations approaching the tunnel.⁵⁰ The Board ordered:

...that the Engineer be authorized to estimate the excavation of Rock taken from the Tunnel Proper, in the proportion of Four dollars per perch for heading to One dollar and fifty cents for bottoming. It was further ordered that one half the money now retained on the Estimates heretofore paid, be now paid to the said Montgomery; which manner of estimating and payment of retained money shall be upon the following conditions, viz: That the said Montgomery shall surrender to the Canal Company so much of his contract as relates to the “Lower deep cut;” that he shall pay off and dismiss the hands employed upon the said “deep cut,” That he shall convey by letter to the Chesapeake and Ohio Canal Company the houses erected by him at the Tunnel and deep cut, as security to the company for the completion of the Tunnel in lieu of the retained money now being advanced to him; That the payment to the hands to be dismissed shall be made under the direction of the Engineer; and that the money which may be paid under the order, including the amount due on monthly Estimates shall not exceed Twelve Thousand dollars.⁵¹

⁴⁷ Ibid., Proceedings, President and Directors, June 28, 1838.

⁴⁸ Ibid., July 12, 1838; Notice to Contractor, signed by Fisk, August 1, 1838.

⁴⁹ Ibid., ltr., Montgomery to President and Directors.

⁵⁰ Ibid., ltr., Fisk to President and Directors, [month and day not recorded] 1938 [sic]

⁵¹ Ibid., Proceedings, President & Directors, July 18, 1838.

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The Board's policy with respect to the retention of a portion of the money due a contractor for work that had been performed as a guarantee for the execution of the contract was troublesome. Hard pressed contractors were continuously applying for advance from these "retained moneys," negating the purpose of the retention. The Company frequently made advances from these funds, only to have the contractor abandon or relinquish his contract, and the Company's security for the job was either gone or considerably reduced. On the other hand, contractors, workers, and the public often believed, with considerable reason, that the Company withheld too large a percentage or withheld it in a manner that worked an undue hardship upon the contractors and workers. It was this practice which contributed to the popular criticism of the Company during the unrest of 1838. The justice of the practice varied. In some instances the reserved funds were liberally advanced; in others, they were withheld at times when their release would have seem justified. The apparent capriciousness of the Board helped turn public sentiment in favor of the contractors and laborers at the expense of the Canal Company.

Returning to the authorization ordered by the Board: An advance was made to Montgomery, but the terms, i.e., the surrender of the "lower deep cut" portion of the contract and the hours, were not complied with. Instead, the contractor offered to repay the advance out of the next estimate, if the Board did not approve the payment sans terms. The Board did not approve and ordered that the advance be repaid from the estimate.⁵²

Montgomery was not in a position to make restitution of \$12,000 out of his next estimate and meet his other obligations. Fortunately for him, President George C. Washington visited the canal line; and when the Board met on August 15, a letter from the still absent President persuaded the officials to suspend the order, and Montgomery was not required to repay the advance.⁵³ This action probably kept the contractor from immediate bankruptcy and permitted the continued work on the tunnel contract.

A serious accident in one of the shafts in November, 1838, threatened to precipitate another labor crisis. Arguing that the danger inherent in working from the shafts in comparison with working from the open upstream portal, justified an increase in wages. However, the arrival of a number of Welsh miners, who were immediately put to work in the "Shaft D," prevented the contractor from being forced to come to term; and all of the workers remained on the project at current wages.⁵⁴

As 1838 drew to a close, Morris wrote the attached report to Fisk that spelled out the amount of work that had been accomplished by the end of November. According to Morris, two double shafts, labeled A, B, C and D had been sunk to a total depth of 620 ³¹¹ ft. He reported that 690 lineal feet of tunnel had been driven from the southern (upstream) portal; 36 feet from Shaft D; 38 feet from Shaft C; 174 feet from Shaft B; and 224 feet from Shaft A. No tunneling had been driven from the northern (downstream) portal, which had not been reached via the excavation of the "Lower deep cut." The total of tunneling accomplished was 1,162 feet, leaving a total, according to Morris of 1,956 feet to be driven. The Assistant Engineer noted that during November Contractor had made some profit on the contract, as a whole; but that the tunnel was a "sinking concern."⁵⁵

⁵² Ibid., Proceedings, President and Directors, August 9, 1838.

⁵³ Ibid., August 15, 1838.

⁵⁴ Ibid., ltr. Morris to Fisk, December 7, 1838.

⁵⁵ Ibid.

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The end of 1838 saw work at the tunnel progressing under conditions that were superficially more favorable than had been the case earlier. Three shifts per day were working from the shafts and upper deep cut,⁵⁶ and the excavation of the lower cut was slowly proceeding to the point where the tunnel's portal was to be located. Morris estimated that 60,000 cubic yards of the tunnel remained to be moved, out of a total tunnel excavation of 82,000 cubic yards. He also predicted that twenty months would be required to complete the contract.⁵⁷ Some construction problems had been solved; and the workers seemed to be relatively well satisfied. The management of the project, of which Morris had been very critical during the earlier portion of the year, had become reasonably efficient – as good as the Assistant Engineer believed it was probable that it would ever be.

Behind this façade the ominous threat of financial difficulties was present. The estimated cost for the contract was \$530,565. By the end of the year a total of \$237, 645.62 had been expended, leaving a balance in unexpended funds of \$292,919.38. More than one half of the moneys had been spent, but combining the work to be done in the tunnel and lower deep cut, less than half of the contract had been completed. A harbinger of things to come was noted in Morris' advice that on the excavation 60,000 cubic yards of tunneling yet to be accomplished the cost would be \$180,000, on which the contractor would experience a loss of twenty-five per cent, or \$45,000.⁵⁸

After a relatively quiet period, labor unrest briefly threatened to disrupt operations in February, but the work continued. Morris reported concerning that month's progress as follows:

Notwithstanding 2 or 3 days spent by the men in warlike demonstrations, the progress of the Tunnel in the month of February has been extraordinary; 176 ft. lineal of heading has been driven, making total of full heading driven on the 1st day of March – 1605 ft or more than one half of the whole distance. 1513 ft remaining to be driven:

The cost of the Tunnel workings has also been moderate [for the month] (being under contract price) and the Estimate of Mar. 1st on this work would be a good one if it were not for the Deep cut which having some time since helped the work along, begins now on account of the long hauling to drag very heavily:

The minimum cost of the deep cut transportation seems to demand that the Berm Rd. Rdy should be soon put into use in order to diminish the expenses:

It would seem from the progress of the Bottoming for many months & from the opinions (in which I do not concur) of Montgomery & his Bosses, that we shall not be able to drive the bottoming much faster than the heading has latterly been driven, and as we can work that to advantage only at the two ends, this furnishes an additional & powerful argument why we should soon lay our rail Road & attack the bottom at the North end:

I shall accordingly issue orders to Mr. Montgomery before long respecting the Rail Road in the Northern Deep cut & will have a sufficient force organized upon the lower or bottom breast, as soon as the spring rains shall be over.⁵⁹

⁵⁶ Ibid., ltr. Morris to Fisk, January 11, 1839.

⁵⁷ Ibid., Report of Work on Tunnel Residency for December, 1838.

⁵⁸ Ibid., ltr., Morris to Fisk, January 11, 1839.

⁵⁹ Ibid., ltr., Morris to Fisk, Mar. 1, 1839.

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Total = 25.296 8/27

Do

This produces in the Estimate in addition to the 12.5 c yds of heading & the 8 ¼ c yds of Bottoming per foot lineal heretofore taken – 4.504 7/27 c yds per ft Run (owing to scale not being exact)

And the Final A/C stands Thus

Whole Tunnel to be Estd ÷ 25,296 7/27 c yds per foot run X \$3 -----\$75.888 8/9

Divided Thus

| Run | | | |
|-------------|-----------------------------------|----------|----------------------------|
| 12.5 | c yds per ft/of heading – x | \$4.00 = | \$50.000 |
| 8.5 | “ “ Bottoming – x | 1.50 = | 12.375 |
| 4 504 17/27 | “ “ to compl Finish x | 3.00 = | <u>13.513 8/9</u> |
| | Tunnel Excavation per foot lineal | = | \$75.888 8/9 ⁶⁴ |

During November, Morris prepared specifications for the bricks to be used in the tunnel's arch. These were to be burned and to measure 9 inches by 4 ½ by 2 ¼.⁶⁵

1839 ended with work moving slowly toward the completion of the tunnel contract. In spite of financial shortages, poor management, and a continuing undercurrent of labor unrest that was suppressed only through resort to harsh measures, and physical obstacles, the construction was continued. However, by this time, talk of a dam below the tunnel and the provision for slackwater to supplement the navigation of the Paw Paw Bends had ceased. The tremendous and expensive odds that had been obvious to Morris were now apparent to Fisk and the Directors.

The first three months of 1840 were so uneventful as to merit little mention of the tunnel in Company papers. On April 4, Morris reported:

. . . . 187 feet now remains on April 1st between the Headings I have concerted measures with Mr. Montgomery which will enable us, (as soon as the headings are united) to raise the lineal drive per month of the South Portal Bottoming to 75 ft., and if it is practicable to 100 ft. run per month:

One part of this plan is to work night shifts upon the Bottom after the 1st of June and to make both the day and night shifts as strong as possible consistent with advantageous working:

I feel satisfied that we may (in good time) drive out at the South Portal all the bottoming up to shaft D, and in the hope that by good management, we may even work north from the south end as far as B:

Owing to slides & other obstacles, I have ceased to calculate upon the transportation of any of the Bottoming, through the Deep Cut: If time should press we must resort to the shafts.⁶⁶

⁶⁴ Ibid., ltr., Morris to Fisk, November 6, 1839.

⁶⁵ Ibid., Specifications for Brickmaking, Nov. 21, 1839.

⁶⁶ Ibid., ltr. Morris to Fisk, April 6, 1840.

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On June 3, the headings were driven through to a junction of the working parties. The cost of the work at Paw Paw as of June 1 had been \$407,278.77. A revised estimate had been made on November 30, 1838, setting the total cost of the contract at \$610,730. This figure represented an increase of \$40,265 over the earlier estimate of \$530,565.⁶⁷ Thus, under the new figures, \$203,551.23 remained unspent. Although the cost had already exceeded the original estimate of \$331,606 by \$65,671.23, the officials of the Company expressed themselves well pleased with the results and lavishly praised Mr. Montgomery.⁶⁸

While a hole had been driven through the tunnel line, a great amount of work remained to be done. The shaping and arching of the tunnel were incomplete; the towpath had yet to be prepared; and the masonry portals were still to be erected.

The two major problems that attended work at the tunnel during 1841 were frequent rock falls, in both the tunnel proper and the lower deep cut, and Montgomery's financial woes. The first resulted in deaths, injuries to personnel and equipment, delays in work, and rising costs. The second, retarded work, involved Montgomery in unpleasant relations with workers and creditors, and were [sic] sympathetic of an economic climate that eventually jeopardized the completion of the Canal.⁶⁹

One event of considerable significance to the construction of the tunnel and adjacent section was the resignation, on April 13, 1841, of Elwood Morris. In fact, the Assistant Engineer's resignation was a part of a larger picture that was important to the history of the building of the Canal. Morris' action was directly connected with a change in administration that resulted from an extension of state spoils system to the operation of the Company. This condition resulted from the fact that the control of the Company had come to be vested in Maryland's state administration. The appointment of Francis Thomas, Jr., as president in June, 1839, was a result of a change in administration of the state. There can be no doubt that the affairs of the Company were in a bad condition during late 1838 and early 1839; but the intrusion of partisan politics created more problems than it solved. Unfortunately for the Company, this intrusion became chronic.

At this distance, the personality of Morris is difficult to assess. He may have been difficult in his personal relations with officials of the Company. Certainly, he irritated Fisk, the Chief Engineer, by his frequent invoking of critical standards that pricked his supervisor's balloon of optimism. While his occasional letters to the President and Directors were respectful, they usually reflected an opinion that was at variance with what those gentlemen wished to hear. His placing of much of the responsibility of labor, financial and public relations problems on the Company was not calculated to win him much affection with its official. The pleasure with which Dungan, his assistant who became his successor, informed Fisk that Morris had departed may tell something of the relations between the two men – it also tells something about Dungan.⁷⁰

While the man's personality may not be apparent in the surviving documents, his competence as an engineer is. He erred in his estimate of the cost of the work at Paw Paw; but his error was based upon prevailing prices and evidence that could not be tested until after the work started. At that, he was more realistic than Fisk or the Board. His delineation of the work to be done and his

⁶⁷ *Ibid.*, Progress of Work, Tunnel Residency, May 1840.

⁶⁸ *Ibid.*, Proceeding, President and Directors, July 20, 1840.

⁶⁹ *Ibid.*, ltr., Wm. H. Bryan to Fisk, June 23, 1841; President M. C. Sprigg to Fisk, Sept. 28, 1841; H. M. Dungan to Fisk, Dec. 21, 1841; H. M. Dungan to Fisk, Dec. 28, 1841.

⁷⁰ *Ibid.*, Dungan to Fisk, April 27, 1841. For a brief period, in 1840-1, Morris replaced Fisk as Chief Engineer.

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drawings show that he was skilled in his profession; and the carefulness with which he kept his records, and reported progress is a welcome relief from the carelessness and vagueness which characterized so much of the voluminous Company records. His candor, perspective, and independence were rare, and they make the work of any one dealing with the Canal a little easier. This writer is glad that Morris and not most of the other engineers was associated with the tunnel.

Dungan, who succeeded his former supervisor, soon found himself immersed in the same problem which had confronted Morris. If the surviving materials are faithful in reflecting the abilities of the men, Dungan was neither as capable or blunt; and his task was made more difficult by the worsening financial climate. By the end of the year, he was echoing Morris' warnings and pleas for justice to Montgomery, who was suffering crippling losses as a result of a legion of construction troubles.

The paucity of the data left by Dungan makes it impossible to determine the progress made on the tunnel work during 1841. That the work was pushed is indicated by the correspondence cited above in connection with rock falls and Montgomery's financial troubles. The Board continued to be "sanguine" in the hopes for the completion of the work.

By the beginning of 1842, the financial condition of the Canal Company was in a state of impending crisis. Montgomery's situation was hopeless. On March 26, he wrote the following letter to Fisk:

. . . . from the conversation of Last Evening had with you I understand you to want from me a statement of the manner we have been geting [sic] along the past winter and what were difficulties we had to contend with and what the suffering and also what would be Required to continue to work with the present number of family men that have not been able to leave this place. In answer I would say that on the 1st of October after the receipt of the dividend that was then paid I obtained 4500.\$ worth of produce and Bufo [sic] from James Taylor by paying him \$1000 in money at that time the Ballance [sic] of the money then Recd was applied in payment of such debts as I involved my friends this was done by the advice of M. C. Springg [who had succeeded Thomas as president in April, 1841] our worthy president accepting [excepting] 450\$ which was used to obtain powder. This suply was soficient [sic] to keep us comfortably untill [sic] the middle of January at what time we ran out of Everything of the provision or feed kind and we were Reduced to actual Sufering [sic] for want of all kinds of provisions and it was difient [sic] to save life from Starvation it was useless to detail here the shifts and [illegible] some were compeled [sic] to use musty chaf [sic] that had been Refused to the horses in the fall and some without any thing for any I done all in my power by dividing the last pound of flour or meal and have been for day[s] without flour in my house this is a faint description of the Real state of affairs at this time but when the Bushicks bill was Reported I would my letters and the bill to diferent [sic] persons and the hardist [sic] obtained a small suply [sic] of wheat & corn which I had ground for bread and left my horses to famish having nothing but a scant supply of corn foder [sic] this suply [sic] soon Ran out and I had no alternative but divide a few seed potatoes among them to save life a day or two mean time some of the men pledged themselves of from 40\$ [to] 80\$ and have in a number of cases pledged these [sic] his cost for a barrel of flour to be forfeited if

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not redeemed in a month the place is now without Either Bread meat or any kind of greens but the kindness of the president in sending an order for 9 Barrels of flour will afford a temporary [sic] Relief as many of the men are gone to the country to seek Relief the younger men in particular. I would also state that there are several suits brought against me and some of my firm friends are likely to be much ignored [injured] in consequence of not Receiving some assistance altho [sic] under all these circumstances [sic] and manifest a disposition to as indulgent as posible [sic] and I am of the opinion that I might keep the santu [sic] men employed at making Brick and carrying on some part of the Excavations at about \$1000 per month in good funds provided I could Relieve some of the pressing wants of my faithful friends you are aware no doubt of many of States of affairs better than I can state them you will at all events find me Reddy [sic] and willing to carry on to Execution your wishes to the utmost of my ability.⁷¹

The plight of Montgomery and his employees was as pitiable as the letter indicates, and their situation was duplicated along the sections under construction. The financial affairs of the Company were so desperate as to preclude substantial relief. In fact, by 1842, the situation had reached a point when, unless some agency outside the Company should come to the rescue, the Canal was doomed.

During most of the decade since 1839, the Canal Company had experienced financial difficulties of varying degrees of seriousness. A variety of measures, some expedients other serious efforts at a final solution, were resorted to in an attempt to prevent, or forestall, bankruptcy. Subscription of additional funds by Maryland in 1834; issuance of canal script in 1834, 1837 and 1838; bank loans in 1834, 1835, and 1839; Maryland state bonds issued in 1835 and 1836; by pothecation of Maryland bonds; changes in administration had all failed to save the Canal from the results of poor planning, poor administration, underfinancing, rising costs, inadequate income, and imprudence.

The financial situation, combined with the political relationship between the Canal and the State of Maryland, resulting from the latter's position as controlling stockholder, brought a revolution in the directorate of the Company in June, 1839, when Democratic control of the State government brought Francis Thomas, Jr., to the presidency. Another, in April, 1841, brought a predominantly Whig board, with Michael C. Sprigg as president, into office.⁷²

Early in 1841, the General Assembly of Maryland had passed a bill granting \$2,000,000 in bonds to the Canal Company, providing the mine owners of the western part of the state would guarantee to pay the state \$200,000 a year beginning six months after the completion of the Canal's construction. The mining companies refused, and the act lapsed.⁷³

Its funds nearing exhaustion and despairing of timely state aid, the Company's officers began to prepare for a suspension in operations in March, 1841.⁷⁴ The new officials undertook some reforms, one of which was an order to collectors to require that tolls be received one-third in current money after August 1.⁷⁵ This was followed by the authorization of final suspensions of

⁷¹ Ibid., ltr., Montgomery to Fisk, March 26, 1842.

⁷² Ibid., Proceedings, President and Directors, April 13, 15, 29, 1841.

⁷³ Acts of Maryland, 1841; Baltimore "American", April 12, 1841.

⁷⁴ Records of C&O Canal Co., Proceedings, President and Directors, March 16, 1841.

⁷⁵ Ibid., July 15, 1841.

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work; however, the Board agreed to accept drafts on the Company by the Contractors in an effort to encourage them to continue work on their own until further aid could be obtained.⁷⁶

On April 1, 1842, the Board required the payment of tolls in cash.⁷⁷ Work on some sections continued for a few more months, coming to a stand-still by the end of the year.⁷⁸ The long, disastrous period of financial experimenting had been ended – so had work on the Canal.

By 1842, over \$10,000,000 had been spent on the construction of the Canal, and almost another \$2,000,000 had gone into interest and losses.⁷⁹ These figures meant that, to date, construction had exceeded the U.S. Board of Engineers estimate for the eastern section of the Canal of \$8,177,081.05 by nearly \$2,000,000 and the Company's and Geddes and Roberts estimates for the total cost from Georgetown to the Ohio of \$4,500,000 by \$5,500,000.⁸⁰ Rises in the cost of land, supplies and labor, poor management and planning, and the unrealistic original estimate had conspired to bring the Company to the brink of financial collapse.

The Company's condition almost hopeless, its officials confessed to an indebtedness of \$1,195,400 beyond its total resources.⁸¹ Many of its assets were tied up in the few remaining five per cent bonds, which were deposited in the House of Baring, in London.⁸² These resources were not available [sic] to the Company; and, even if they had been, they would have been inadequate.

By the time construction was suspended, the Canal was completed as far as Dam No. 6, a distance of approximately 135 miles from Washington. The portion of the line from the dam to Cumberland was termed "the fifty miles". Of this portion, which promised to be extremely expensive, thirty-two miles of work had been accomplished, but scattered along the fifty miles were eighteen miles of the heaviest work – including the working at Paw Paw Bends – still unfinished. Fisk, still optimistic and promising great things if the work were completed, estimated that \$1,545,000 would pay for the eighteen miles.⁸³

Fortunately for the Canal Company, no one raised the question of forfeiture of its charter, which had provided that the eastern portion should be completed in 1840.

The Canal Company and its supporters had been active, even before the suspension, in attempts to rescue the project. One of these efforts was directed toward the transfer of the bonds held by Barings to the Company. The transaction provided that the Company sell to the bank house at 65 enough bonds to repay advances that had been made. The Barings would also take at 85 the coupons required to pay the interest due on the drafts that had been made. The transfer of the balance of the bonds was effected in March, 1846.⁸⁴

⁷⁶ Ibid., Aug. 7, 1841; September 16, 1841.

⁷⁷ Ibid., March 16, 1842.

⁷⁸ Ibid., ltr., Fisk to President and Directors, Dec. 1, 1842.

⁷⁹ Chesapeake and Ohio Canal Co., 13th Annual Report, Appendix p. 28.

⁸⁰ 19th Congress, 2nd Session, House of Representatives, Document No. 10 printed as "Message of the President of United States, transmitting a Report from the Secretary of War with that of the Board of Engineers for Internal Improvements, on the Chesapeake and Ohio Canal." December 7, 1826; Fill and Johnson, Maryland Reports, vol. 4, Answer of the Chesapeake and Ohio Company, pp. 26-7.

⁸¹ "Niles' Register", LXI, No. 22 (Jan. 29, 1842).

⁸² Records of the C&O Canal Co., Proceedings, President and Directors, Jan. 8, 1840.

⁸³ Ibid., ltr., Fisk to President and Directors, December 1, 1842.

⁸⁴ 16th Annual Report (1844).

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The state, meanwhile, had adopted a measure that was represented as being taken to compel the Company to improve its condition by requiring the sale of superfluous lands.⁸⁵ The Company was to receive scrip and other evidences of debt in payment. A survey of the lands was made, a few parcels were selected, and sales made during 1843 and 1844. The results were very small, even when reckoned in depreciated canal scrip. The total received was \$25,938,⁸⁶ scarcely enough to Salvage [sic] the fortunes of the harassed Company.

The first form which the proposals to finish the work took was an attempt to effect the transfer of stock from the United States to Maryland. The federal government held \$2,500,000. In return for the transfer of the stock, Maryland offered to guarantee to complete the Canal to Cumberland. This proposal was made by a committee of the Assembly as early as 1839.⁸⁷ During the next five years, petitions in support of this proposal were submitted to Congress.⁸⁸ While the plan was popular in Maryland, it was opposed by most of the interested people in the District of Columbia. The Company officials were rather indifferent to the outcome, being interested only to the extent that they hoped that the state would enact legislation guaranteeing the Canal's completion to Cumberland. After lengthy consideration, the efforts to provide for the stock transfer failed; and the plan was abandoned.

A proposal to sell the state's interest to parties that would undertake the Canal's completion failed for a lack of bidders. The Company even attempted to sell itself, compounding the absurdity of the affair by offering to buy itself from the state by offering canal bonds to Maryland for \$5,000,000.⁸⁹ The price was ridiculously high, and the efforts to make a sale failed.

After lengthy debate and several parliamentary and legislative defeats, an act was passed in March, 1845, providing for a waiver of Maryland's lien against the Company. The new Canal bill provided that the C&O could issue \$1,700,000 of preferred construction bonds on the mortgage of its revenues, when it received guarantees from interested parties for 195,000 tons of trade annually for five years.⁹⁰ The guarantees were obtained, and in August, 1845, the Governor certified his approval.⁹¹

With funds now available, the Company entered into a contract with Walter Gwynn, William Thompson, James Hunter, and Walter Cunningham, on September 23, 1845, for the completion of the Canal. The additional mortgage to the state, required by the legislative act, was executed

⁸⁵ Laws of the State of Maryland, 1842.

⁸⁶ Records of C&O Canal Co., Itrs., Fisk to Young et. al, April 6, 1842; Fisk to President and Directors, July 20, 1842; Ibid., Report on Sales of Lands in Accordance with the Act of 1842.

⁸⁷ Baltimore "Sun", April 7, 1839; A Short History of the Public Debt of Maryland, Appendix Document P, pp. 76-8.

⁸⁸ 26th Congress, 1st Session, House of Representatives, Document No. 90, "Message on the Chesapeake and Ohio Canal from President Van Buren, transmitting a Letter of the Maryland Governors, William Grason, on the Transfer of Stock in the Chesapeake and Ohio Canal Company," January 6, 1840; 26th Congress, 2nd Session, Senate Document No. 63, "Report of Senator S.S. Phelps on the Chesapeake and Ohio Canal Company Stock; January 11, 1841; 27th Congress, 3rd Session, House of Representatives Document No. 71, "Resolution of the Maryland Legislature for the transfer of Chesapeake and Ohio Canal Company Stock by the United States to Maryland," January 18, 1843; 28th Congress, 1st Session, House of Representatives Document No. 227, "Resolution of the Maryland Legislature urging the Transfer of the Chesapeake and Ohio Canal Company Stock to Maryland," April 12, 1844.

⁸⁹ Records of C&O Canal Co., Proceedings President and Directors, May 4, 1843.

⁹⁰ Acts of Maryland, 1845; Niles "Register", LXVIII, No. 1 (March 8, 1845) and No. 2 (March 15, 1845).

⁹¹ A detailed study of the period of suspension and the various schemes for resumption, as well as the administration of William G. McNeill, should be the subject of a separate comprehensive report.

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on January 5, 1846.⁹² Gwynn and Company agreed to provide materials of required quality according to the specifications of the Chief Engineers, to begin work within thirty days, to complete the canal by November 1, 1847, to raise \$1,000,000 for the use of the Company, and to cash the bonds of the Company at par, paying the interest on them until January 1, 1848. The price to be paid for the work was set at \$1,625,000 in Canal bonds.⁹³

Gwynn and his associates undertook to fulfill the terms of his contract. All of the sections were sub-let in October, and a token force went to work on November 1, pending negotiations for funds to pay for major construction. However, the results were disappointing; and by May 1, 1846, the work amounted to but \$55,384. The effects of the Mexican War and collapse of financial negotiations militated against the performance of the work. The Board of Directors threatened to declare the contract abandoned.⁹⁴ This threat was a rather feeble thing; unless funds were obtained, the work simply could not be accomplished. By June, only ten men were working. The negotiations for the sale of the bonds collapsed in July, and work ceased.⁹⁵ Thereafter, all construction was suspended during the rest of 1846 and most of 1847.

Negotiations continued until mid-1847. Maryland, Virginia and the District cities came to the relief of the Company; and the contractors carried the negotiations to a successful conclusion.⁹⁶ Mortgages were prepared pledging the Canal's revenues; and work was resumed on November 18, 1847. The old contractors' company was reorganized with a partnership of Hunter, Thompson and Harris – Gwynn and Cunningham had retired.⁹⁷

The contract for the work at Paw Paw Bends was sublet to the firm of McCulloch and Day.⁹⁸ The original contractor, Montgomery, ruined by his efforts to fulfill his contract, was by this time involved in a maze of law-suits.

The papers of the Canal Company are silent on the amount of work that remained to be performed when McCulloch and Day took over the project. Work was carried out in such a manner that by 1850 the tunnel was ready for traffic at the opening of navigation from Cumberland. However, the brick archery remained to be installed.⁹⁹ The date on which this work was accomplished has not been determined.

Thus ends the story of the construction of the Paw Paw Tunnel, the most remarkable structure on the C&O Canal. It is, today, in a remarkably good state of preservation, requiring only to be re-watered in order to provide an excellent interpretive medium.

⁹² Records of C&O Canal Co., Proceedings, President and Directors, September 23, 1844; September 24, 1845; September 25, 1845; January 5, 1846.

⁹³ 18th Annual Report.

⁹⁴ Ibid., pp. 10-11; Niles "Register", IXIX, No. 8 (October 25, 1845).

⁹⁵ Records of C&O Canal Co., ltrs., Fisk to President and Directors, June 25, 1846; Clement Co. to Coale, July 10, 1846; Proceedings President and Directors, July 16, 1846.

⁹⁶ Niles "Register", LXXII, No. 19 (July 10, 1847).

⁹⁷ 20th Annual Report, pp. 7-8.

⁹⁸ Ibid., Appendix D.

⁹⁹ Records of C&O Canal Co., Proceedings, President and Directors, July, 1849.