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ABSTRACT

This narrative history of the Middlesex Canal from 1792-1853 is designed to be used with "Canal," a role-playing, decision-making game found in SO 011 886. Economic, social, and political factors related to planning, building, and implementing the canal are considered. The document is presented in three parts. Part I states reasons for studying the Middlesex Canal. It was the first lengthy canal in the United States and served as a model for other canals. In addition, the problems that arose are typical of those that must be dealt with in relation to any type of transportation system. Part II describes events leading up to the canal opening in 1803, including legislative grants, court regulations, surveys, the introduction of the magnetic compass, and actual construction with its concomitant employment and technical problems. Part III outlines events and factors affecting the rise and fall of revenues, and concludes with the canal's demise in 1853 following the growth of railroad systems. 1804-1815 saw growth and extension of the canal into New Hampshire, which helped alleviate competition with the Connecticut River. From 1816-1835, the primary problem was in making the canal more attractive than hauling by land, and cloth hauling from Lowell to Boston and back was set up. However, in 1836 the Boston and Lowell Railroad was opened and canal traffic dwindled until the canal was closed in 1853. Railroads were better adapted to Massachusetts needs, because they could operate year-round, cost less to build, and were available for all to use. (CK)

TOWPATHS TO OBLIVION

The Middlesex Canal and the Coming of the Railroad 1792-1853

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Teaching with Case Studies
A basic guide for teaching the case study method.

From Family Firm to Corporate Giant
A study of the J. P. Stevens Company, from its beginning in 1813 to 1963. (A teacher's guide accompanies this booklet.)

Canal
A role playing exercise dealing with the beginnings of the Middlesex Canal. This "game" may be used in conjunction with the **Towpaths** case study.

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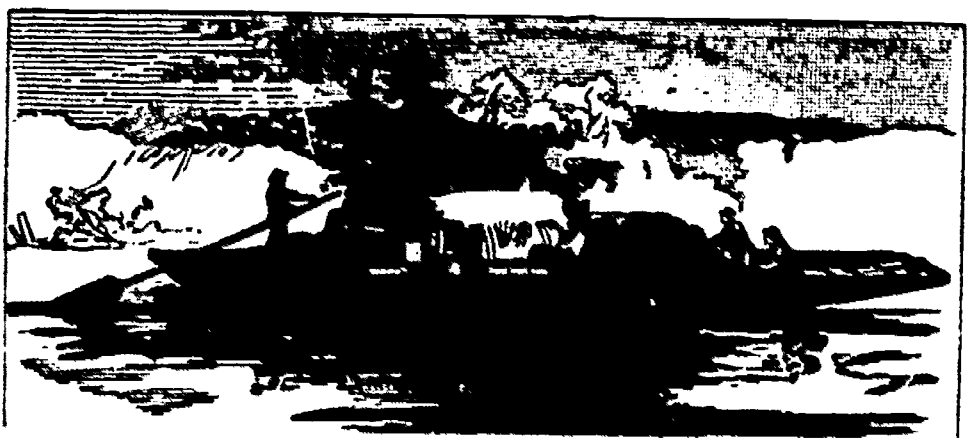


Accompanying this case study is a role playing, decision making game, called CANAL. The game may be played separately, or as part of the following case material. Because CANAL deals with the conditions and decisions preceeding the actual building of the Middlesex Canal, the game should be played before the case study is used. Before making a decision, it is suggested that the teacher read through all the case material first.

I would like to acknowledge with gratitude the support and encouragement of the following people who have helped to make this case possible: Dr. Ralph W. Hidy, Isidor Straus Professor of Business History, Harvard Graduate School of Business Administration; Dr. Paul H. Tedesco, Associate Professor of Education, Northeastern University; Dr. C. Joseph Pusateri, Associate Professor of History, John Carroll University; and particularly to the Middlesex Canal Association and its members (Arthur L. Eno, Jr., Frederick Lawson, Jr., and Colonel William M. Hoxie, P.E.) for their gracious assistance and permission to use materials and their pictorial collection.

PROLOGUE

The completion of the Erie Canal in 1825 ushered in a whole new era of economic, social, and technological development in the United States. It did not take people, and their state governments, long to see that the Erie Canal was tremendously successful in developing more business and jobs, in starting new towns or rejuvenating older ones, in bringing people together, and in bringing farmers closer to their markets. Immediately, most of the states had canal projects underway. People looked forward to the day that a network of canals would bind the nation together physically, as the Constitution hoped to bind it together ideologically and legally. It would soon be possible to go by water from New York City all the way to Evansville, Indiana or Portsmouth, Ohio.

Why was it that the Erie Canal caused all this excitement? When it was started, the Middlesex Canal in Massachusetts had been completed and was operating. Certainly the men who planned, built, promoted, and operated the Middlesex had dreams that it would be the model for the rest of the nation. Why did it fade from public notice? How successful was it? Why was it built at all?

One of the reasons for studying the Middlesex Canal is that it was the first canal of sizable length built in this country. It not only worked, but the problems which were solved in building it made the Erie Canal and other canals possible. A second reason for studying it is that the types of problems it was intended to solve have to be dealt with when thinking about any type of transportation system. Perhaps more important, by studying the Middlesex Canal you will be involved in the decision making process. You will see that making a decision is not a simple matter of choosing one thing instead of another. Many things have to be taken into consideration. At the end of this case, we hope you will have a clearer idea of how you and others go about judging whether a decision is good or bad, and what are some of the standards you can use to evaluate a decision once made.

1793-1803 THE MIDDLESEX CANAL

A group of prominent businessmen from Medford, Massachusetts, wanted to improve the method by which their goods were transported west from Boston. They believed that building a canal to the Connecticut River was too expensive. Instead, they wanted to build a canal that would run from Boston, through Medford, and join the Merrimack River at its bend near Chelmsford (now Lowell).

Jonathan Porter, Samuel Swan, the five Hall brothers, Loammi Baldwin, and James Sullivan were incorporated on June 22, 1793 as "The Proprietors of the Middlesex Canal." This was done three years before the incorporation of the first turnpike company in Massachusetts.

The legislature granted these men the right to build a canal from Boston to the Merrimack River, to charge tolls for the use of the canal, and to erect mills on land next to the canal bed. Subsequent legislative acts also made it illegal for anyone to damage or obstruct the canal in any way.[1] Since the canal was a new venture, the General Court had to put together new regulations concerning the way that a canal company might obtain land. Public statute provided that in certain cases private land "may be taken for the public use; in order that no person may be damaged by the digging and cutting of the canal...by the Proprietors without recognizing full and adequate compensation thereof..."[2]

Once the Proprietors were incorporated, they had shares printed and opened subscriptions for stock in their new company. Among those buying the first lot of shares were John Hancock, Oliver Wendell, John Quincy Adams, John Adams, Josiah Quincy, and the Reverend Jedidiah Morse. A total of 740 shares were owned by 50 subscribers. During the first ten years of the company's existence, only 51 shares transferred hands on the average each year.

The Proprietors voted to have a survey made of the canal route as soon as the shares had begun to sell. Samuel Thompson, a self-taught surveyor, was given the job. He travelled up the Mystic River to Mystic Pond, then to Horn Pond and on to Wilmington and the Concord River, reporting

the ascent to be 68½ feet. From Billerica on the Concord River, Thompson proceeded to Chelmsford on the Merrimack River, estimating the rise between the Concord and Merrimack Rivers at 16½ feet. The Proprietors received Thompson's report and asked Captain John Hills to recheck the figures. (In April 1791, Hills had surveyed the Boston to Connecticut River route for General Knox, Secretary of War.) Hills did this with the help of Loammi Baldwin. After three days work, the two men found serious errors in Thompson's calculations. Hills and Baldwin found, in fact, that the ascent from the Mystic to the Concord River was 100 feet and that the Concord River was, in fact, 25 feet above the Merrimack.

Not a little alarmed, the Proprietors sent Baldwin to meet with William Weston, an English canal builder then working in Philadelphia. After talking with Weston, Baldwin returned with an "Instrument" to be used in getting level sights in surveying. The "Instrument" consisted of a magnetic compass and a spirit level. There is evidence that this was the first perfected leveling instrument used in America.[3] Weston arrived in Boston a short time after Baldwin returned and the two men resurveyed the route. Their report stated that the canal could be built for a cost of approximately $333,333.

Loammi Baldwin was named superintendent of the canal and was given the task of building it. His powers included directing the job of cutting and digging the canal bed as well as the hiring of carpenters, blacksmiths, stonecutters, stone layers, and teamsters. Baldwin turned the first shovel of dirt for the canal on September 10, 1794.

Baldwin decided that the canal company would have several crews, each with a special responsibility for building either the stonework, the aqueducts, or the locks. He also contracted with men for surrounding farms to build sections of the ditch, towpath, and the berm. (The berm is the embankment on the opposite side of the towpath, forming the ditch.) Such men would take care of all the construction except when stones were too heavy for two men to lift into a cart were found. The canal company would have to blow such stone apart. These contracted farmers constructed about 80 percent of the length of the canal.

Baldwin found that it was difficult to recruit workers locally to work for the canal company crews. He had to recruit men from the cities, especially recent immigrants. These men were hired by the month and housed in company-owned barracks near the canal site. Out of their wages, the workers had to pay for their room and board. Wages for common laborers began at $8.00 per month (1794) and rose to $11.00 (1803). Stone blowers, blacksmiths, and teamsters were paid from $12.00 to $18.00 per month while carpenters received from $18.00 to $20.00 per month.

As construction progressed, Baldwin found that he had to construct 8 aqueducts, 48 bridges, and 20 locks. He was extremely thankful that he had access to the large numbers of experienced carpenters in New England, especially when it came to aqueducts and the floating towpath over the Concord River.

Building the embankment and berm was a problem whenever the excavation ran for more than 400 feet. Baldwin devised a wheelrun for the carts so that they would run on parallel planks held together by cross braces. The loads of dirt then could be hauled out by horses.

A larger problem was the construction of the stone piers for the aqueducts and lock chambers. Knowledge of concrete which would hold well for a long period of time under water was lacking. Some methods had been tried in Europe and America, but the results were not very satisfactory. Almost by accident, one of the Proprietors heard of a substance called Dutch terrace, which came from the West Indies. The Proprietor had some of this new substance shipped to Baldwin. The canal superintendent tried several combinations of this "trass" with lime and eventually came up with a mixture which became hard as rock after it had been in water for 48 hours. Baldwin's use of hydraulic cement on the Middlesex Canal proceeded the cement industry in the United States by some 20 years [4]

The Proprietors and a party of invited guests were able to travel by canal boat from Billerica to Chelmsford by November 19, 1797. They crossed one aqueduct and through three locks, for a total of five and three-quarters miles. In celebration of this event, the Proprietors, Loammi Baldwin, and

their guests went to Howard's Tavern where they consumed 150 pounds of roast meat and gravies, two bushels of potatoes, bread made from two bushels of wheat and a barrel of cider.[5] The Middlesex Canal was well under way.

But there were still some problems that had to be solved. In particular, the berm would break from the pressure of the canal boats passing through the canal or when the locks or sluice gates were opened. These problems were solved by constant puddling, a process of working moist clay to the point where it will not absorb water. Nine and a half miles of canal were opened, despite such difficulties, in December, 1798. In that same year, the Proprietors erected another sawmill and gristmill in addition to the two they already owned on the Concord River. They viewed this expense as a good investment.

The canal building progressed slowly. However, in 1802, Baldwin reported that many boats loaded with freight and rafts of lumber were now using the canal. A raft of boards and planks weighing 600 tons reached Woburn in April, 1802. James Sullivan was able to report in October, 1802, that there were 1,220 tons of lumber on the canal bound for Boston. By 1803, the passenger packet, *George Washington*, with Joseph Wardell "Commander," started daily passenger service on the canal between Billerica and Chelmsford. The trip took two hours at a speed of three miles per hour and cost fifty cents round trip. The banks of the canal were now firm, the locks complete, and their mechanisms easy to operate.[6]

When it was completed in 1803, the canal had 20 locks, 8 aqueducts, and 48 bridges as well as safety gates, sluiceways, and tidal locks. It was 20 feet wide at the bottom, 30½ feet at the waterline, and approximately 3½ feet deep. The locks were 10 to 12 feet wide and about 75 feet long with the average [illegible] between locks about 7 to 8 feet.

One of the most impressive structures on the canal was the Shawsheen Aqueduct which carried the canal 30 feet above the Shawsheen River. This aqueduct was 180 feet long and rested on two abutments and a single pier.

Another technical innovation was the floating towpath. This was built across the Concord River in North Billerica. It consisted of several sections which could be removed to allow rafts of lumber to pass onto the sawmills located further down the river.

Once the canal boats reached the Charlestown tidal locks, they were poled across the Charles River to Boston. The boats then entered a short canal on the Boston side (now Canal Street) and went up to Haymarket Square. Here the goods were unloaded, and either distributed locally or shipped elsewhere.[7]

December 31, 1803 was the day of celebration. Water flowed through the 27¼ mile length of the artificial waterway, from the Merrimack River to the Charlestown Mill Pond. It was the longest single canal in the United States. With great pride, Loammi Baldwin, James Sullivan, and the other Proprietors of the Middlesex Canal advertised:

> The enterprise, which has been successfully completed, surpasses any other project in the northern part of the United States. Those who undertook this task had no prior experience but through the application of natural principles, ingenuity, and firmness, their work has been crowned with success.
>
> The public utility of the Canal forms a communication between Boston and the extensive fine country of the Merrimack up to Lake Winnipesaukee. The advantages of the Canal can been seen by the fact that the timber and lumber for the bridges from Chelsea to Charlestown, at the end of the Salem to Boston Turnpike, and the Neponset bridge leading to the south, were brought down by the canal. Without water transport given by the canal, these bridges would have taken longer to build and would have been more expensive."

That these men worked against great odds and solved problems with ingenuity can be seen in a letter from Loammi Baldwin, Jr. to James F. Baldwin. Loammi wrote that the canals in England were "...no better than the Middlesex. I've seen no horizontal gates like my father's; the one's here are vertical in action. The lockgates and the apparatus are better on the Middlesex."[9]

Boston had found at last an answer to the questions which had plagued its merchants, shippers, and shipbuilders since 1786. The goods, produce and lumber from New Hampshire and Vermont, would be funnelled by canal into Boston. Bostonians would send English manufactured goods, codfish, mackerel, salt, lime, and plaster in return. Newburyport, New Haven, and New York could no longer compete with Boston as Boston was economically secure, thanks to the Middlesex Canal. Or so the businessmen of The Hub thought.

[1]Commonwealth of Massachusetts, *Massachusetts Statutes Private and Special* (Boston, 1815), Vol. I, 469, Vol. III, 131

[2]*Ibid*., Vo. I, 469

[3]Charles Francis Adams, *Memorial History of Boston* (Boston, 1881), Vol. IV, 112

[4]Christopher Roberts, *The Middlesex Canal, 1793-1860* (Cambridge, Mass., Harvard University Press, 1938), p. 99

[5]Memo for Jacob Howard, November 19, 1797, Baldwin MSS. Cited in Roberts, *Middlesex Canal*, p. 103

[6]Proprietors of the Middlesex Canal, "Report to the Board of Directors, October 29, 1801," *Coporate Records and Documents, 1793-1852*

[7]George L. Vose, "Notes Relating to the Early History of Transportation in Massachusetts," *Journal of the Association of Engineering Societies*, Vol. 9, No. 4 (October, 1885), 61

[8]"Paraphrase of 'Advertisement at the Completion of the Canal,'" cited in Roberts *op. cit.*, p. 115

[9]Letter Loammi Baldwin, Jr. to James F. Baldwin, July 22, 1807, Baldwin MSS. Cited in Frederick Kendell Abbott, "The Role of the Civil Engineer in Internal Improvements: The Contributions of the Two Loammi Baldwins, Father and son, 1776-1838" (Unpublished Doctoral Dissertation, Columbia University, 1952), p. 37

THE OPERATION OF THE MIDDLESEX CANAL

1804-1815

In 1805, after one year of operation, the canal seemed to have fulfilled the dreams of those who planned and built it. A total of 9,095½ tons of cargo was brought through it to Boston, while 308½ tons were shipped to New Hampshire and Vermont. Of this total, 8,096 tons were lumber to Boston.[1] The Proprietors were quite satisified with the canal.

According to the canal agent, it had also proven its superiority over the use of roadways in carrying produce. Teamsters charged 25 cents a ton per mile while canal tolls were set at 6½ cents a ton per mile. If the cargo handled by the canal in 1805 had been transported by land carrier, the cost would have exceeded $53,000. The total cost to carry the same tonnage through the canal would have been slightly greater than $13,000.[2]

In addition to the cost differential, the trip would have taken a day and a half by land, using one four ox team per ton of freight. The trip through the canal would have taken approximately five hours down and seven hours up, with one horse or one ox pulling each canal boat carrying five tons of freight. Some of the boats used to handle lumber could carry up to 25 tons apiece.[3] The Proprietors secured their advantage by constructing and operating a fleet of nine canal boats: seven freighters (75 feet by 9½ feet), the passenger boat *George Washington*, and a pleasure boat.

Timber remained the primary source of revenue up until the Embargo of 1808. The old questions which had haunted Boston commercial interests in the 1790s returned with the embargo and the War of 1812. "Will peace restore that active current of business which produced that state of prosperity?"[4] The new company agent, John Sullivan, was certain that peace would bring increased prosperity to Boston. "Did not Boston have a waterway which connected it with the interior as did the other great seaports of the world?"[5]

However, Sullivan sounded a little worried in his annual report of 1813. He told the Proprietors that the canal was the

superior method of carrying goods. It was faster, it was more economical, and it was safer. Sullivan w s also concerned that people continued to ship goods dow the Connecticut River to Hartford and New Haven. Why should they do this when the Middlesex charged a toll one-tenth of that charged on the Connecticut? Why should they ship goods 300 miles down the Connecticut when they could ship those same goods down the 27 miles of the Middlesex to Boston?

What really worried Sullivan was the fact that the Connecticut was navigable, through a series of five locks and canals owned by five different companies, deep into Vermont and New Hampshire. The Middlesex ended at the banks of the Merrimack near Chelmsford. Between Chelmsford and Concord, New Hampshire, there were six steep falls on the Merrimack. Concord was the gateway to the lumber region around Lake Winnipesaukee.

Two of the six falls had been skirted via canals by 1808. But while the Amoskeag Canal (Manchester, New Hampshire) and the Hooksett Canal (seven miles above Manchester) were operating, a canal would have to be built four miles below Concord and three more constructed below Manchester to make the Merrimack navigable to the mouth of the Middlesex Canal. Sullivan did not know how this was ever going to be financed.

However, he noted the fact that both the Amoskeag and the Hooksett Canals were built by selling stocks to raise money. Sullivan, therefore, sought help in the political processes. On March 4, 1809, he received permission from the General Court of Massachusetts to undertake what he desired.

> Two townships in the District of Maine are granted to the Proprietors of the Middlesex Canal to aid them in removing obstructions to water commerce on the Merrimack River And whereas to effect the important public purposes comtemplated Be it enacted by the Senate and House of Representatives that the Proprietors of the Middlesex Canal are authorized and empowered to subscribe for and hold stock in any company that is or shall be incorporated by the State of New Hampshire for the purposes of improving or carrying on inland navigation by the Merrimack River, its branches, and other waters leading to the Middlesex Canal.

By 1814, Sullivan had constructed a series of four additional canals around the falls on the Merrimack. The river was open to Concord, New Hampshire, for larger boats, and to Plymouth, New Hampshire, for shallow bottomed boats. The Proprietors of the Middlesex Canal owned their own system and controlled the Wicassee Canal, Cromwell's Canal, the Union Locks and Canals, the Amoskeag Canal, the Hooksett Canal, and the Bow Canal. For the first time, the Middlesex had a definite advantage over the Connecticut system.

Almost immediately, traffic and toll revenues on the Middlesex increased. In 1808 the canal had earned $7,923; in 1815 canal earnings reached $29,238.[7] There was also an increase in the number of private boats using the canal. The Merrimack Boating Company had been incorporated in 1812 with the sole purpose of shipping on the Merrimack River and the Middlesex Canal.

Looking for another means to increase the speed of shipments through the canal, Sullivan experimented with the use of steam and paddlewheels to propel a towboat. A self-propelled boat was placed in operation on the canal in October, 1812. This boat travelled at a speed of seven miles per hour on the river and four miles per hour on the canal. This boat was followed by the tug *Merrimack* in 1818, but towing by steam was abandoned in 1820.

1816-1835

In 1816 John L. Sullivan reported that:

> with the whole chain of canals from Boston to Concord open, a state of peace, a general revival of business, and the increase of inland trade, it may be but moderate to estimate the actual receipts for the coming season at 30,000.[8]

While Sullivan had reason to be confident, there was still the problem of people who continued to ship by land instead of by canal. Means had to be developed to make canal shipment more attractive.

> Until the latter part of last year, the income of the Canal had been almost wholly derived from the timber rafts and wood boats. But the transportation of merchandise and produce has always been looked forward to as a productive source of revenue. To secure it however, it was necessary to subdue the prejudices and change the habits of the country, and excite confidence in new modes of conveyance. It was necessary in short, that water carriage should be regular, secure, cheap, and convenient. This was done by the formation of the Merrimack Boating Company.[9]

The Merrimack Boating Company, the Union Boating Company after it, and the Boston and Concord Boating Company which developed from the previous two, did much to provide the advantage Sullivan was looking for. The reasons for continued land competition had more to do with the nature and location of the canal in terms of long and short hauls than it did with the types of service.

Concord, New Hampshire, was the point to which most of the goods and produce came to be shipped. Consequently, the large boating companies slowly eliminated stops between Concord and Boston. This produced a number of boatmen who used the canal whenever they could get a full boat or when it was not the reaping or haying season. These men often travelled to Boston fully loaded and returned empty.

Nevertheless, the upward tonnage of such items as groceries, English manufactured goods, iron, flour, fish, cotton, salt, lime, and plaster increased from 1,051 tons in 1817 to 2,313 tons in 1821. By 1830, the canal was carrying about 11,000 tons of coal to the new mills which had been built near Chelmsford at a spot called Lowell. But, even at that, the private boat owners found it hard to justify using the canal when land transportation was available for short hauls. This led the Proprietors to cut the toll costs on many items. However, people still sent goods to Boston overland.

This problem caused the Proprietors a great deal of worry as the teamsters also reduced their rates. Several questions had to be answered. In what ways is waterborne carriage superior to land carriage? What types of products are best shipped by canal? Might there be areas which are better served by canal rather than by land carriage? The fact that the area served by the canal had undergone a great deal of change, was a prime consideration in deciding the new function for the canal.

The Proprietors were certainly aware that since 1785 the Commonwealth of Massachusetts had incorporated over 80 new towns. In addition, statutes had been passed covering a variety of new manufacturing enterprises (including calico, cotton, woolen, printing, iron, and nail mills), aqueducts, bridge companies, canals, fisheries, and over 80 turnpike companies. All of this business activity indicated more and more competition.

In 1828, the Proprietors arranged for a test case between the canal and the teamsters. The test would determine which form of transportation was best suited for transporting finished goods from Lowell mills to Boston. In contrast to the usual situation, the canal brought all the raw materials up to Lowell, but carried only a fraction of the mills' output back to Boston.

The toll committee, before the test, wrote a new classification for "Factory Cotton Cloth" and assessed it at fifty cents a ton. Previously cloth was classified as "merchandise" and charged a dollar a ton.The teamsters charged a standard price of four dollars a ton. The total cost of cloth shipped to the Merrimack Manufacturing Company was $829 by canal boat. This included wharfage charges and trucking costs to any part of Boston.The cost to send the same amount of cloth by teamsters was $1,798.[10] By 1829, all the mills located in Lowell shipped both ways by canal. The Proprietors were jubilant. As the mills prospered so would the canal prosper. At last the Middlesex Canal had found a service over which it had a monopoly. Its future seemed assured.

Unfortunately, the success of the Middlesex Canal came three years too late. It had not been able to really reduce significantly the amount of goods still going down the Connecticut River. And in reaction to the spectacular success of the Erie Canal, the idea of running a canal to the Connecticut River and onto Albany was discussed again. This was the central topic of discussion at a meeting held in Concord, New Hampshire, in 1825. During this meeting, a serious question was raised — "Might the invention of Rail-ways come in aid and surmount the difficulties which occur in the Waterways?"[11]

This debate was followed closely by Patrick T. Jackson and Kirk Boott, agents for the Merrimack Manufacturing Company. In June, 1830, Boott and Jackson, together with Nathan Appleton, Francis C. Lowell and other prominent Lowell mill owners, received permission from the General Court of Massachusetts to build the Boston and Lowell Railroad.

The Proprietors reacted vigorously and protested to the General Court, asking them to revoke the new railroad charter. The Proprietors told the legislature that:

> no safer or cheaper mode of conveyance can be established, nor so well adapted for carrying heavy and bulky items [than the canal]. To establish a substitute for the canal, alongside it and for the whole distance, and in many cases only a few rods from it, and to do that which the canal was made to do, seems a measure not called for by any reason, nor one which the Legislature can permit . With regards to the transportation of tonnage and goods, the means exist for all but the winter months [12]

Not only did the Proprietors fail to block the Boston and Lowell, but James F. Baldwin, Loammi's son and former agent of the Middlesex Canal, was chosen to do the survey for the rail bed. He found that the best route was situated, for the most part, parallel to the canal bed. It is also ironic that the railroad used the canal to transport the parts for its engine, granite blocks for its ties, and the rails.

The Middlesex Canal had five years before the Boston and Lowell Railroad went into operation. During those years, canal revenues rose from $23,400 in 1830 to $41,800 in 1835.[13] Unfortunately, much of that increase was due to the Boston and Lowell using the canal to move their own gear.

1836-1842

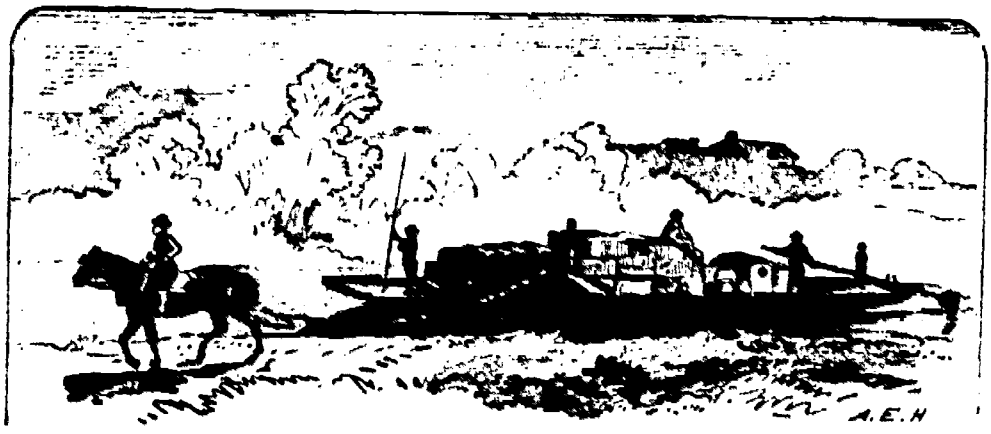
The Boston and Lowell Railroad went into operation in 1835 and was an instant success. They could run from six to eight "burthan" or freight cars in a train at speeds up to 20 miles per hour. The Middlesex Canal had no hope of equaling such statistics.

One year after the Boston and Lowell started service, the worst fears of the Proprietors were borne out. The toll revenue dropped drastically.

Tolls On Lowell Freight Received By Middlesex Canal 1835 and 1836

Paid By	1835	1836
Appleton Company	$1,001.38	$ 118.28
Hamilton Company	1,801.78	667.21
Lowell Company	1,141.08	89.24
Lawrence Company	1,520.20	1,043.95
Suffolk Company	719.98	495.70
Tremont	662.10	510.91
Boott Mills	2,541.47	1,068.07
John Wilson, Jr.	833.30	298.97
Lincoln Drake	1,112.43	1,163.51
John Waugh	155.00	445.50
William Livingston	486.79	294.43

Source: "Report of January 25, 1837," *Corporate Records*, Frothingham MSS.



Despite the obvious implications in the drop in revenues, the Proprietors thought they saw a ray of hope in the business done by the Boston and Concord Boating Company, the principle carrier on the canal.

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Tonnage Carried
By The Boston and Concord Boating Company
1837 and 1840

	1837	1840
Boston to Concord		
Merchandise	2,472	2,954
Salt, plaster, bar iron, pig iron, slate, castings	1,216	1,179
Hard coal	90	50
Soft coal	3	5
	4,268	4,507
Concord to Boston		
Merchandise and Produce	678	605
Factory cotton cloth	29	78
Copper dye	54	19
Hewn stone	297	
	1,265	893

Source: Ibid. Does not include timber statistics.

The Nashua and Lowell Railroad went into operation in 1839. This railroad had an agreement with the Boston and Lowell Railroad whereby its rolling stock could use the Boston and Lowell tracks and thus be taken directly into Boston. Caleb Eddy, agent for the Middlesex, was depressed by this turn of events and wrote: "Never have I known so small a quantity of ship timber brought to market during any one year of the sixteen I have had charge of the Canal.... We are not entirely down and shall survive one more year at least."[14] However, toll recepits dropped from $34,000 in 1836 to $20,600 in 1842.

1843—1853

The Concord and Nashua Railroad, with the same operating agreement with the Boston and Lowell as the Nashua and Lowell, began running in 1842. That fall, the Boston and Concord Boating Company went out of business and the Proprietors slashed the tolls in half to keep going. This did little good as business was negligible.

In 1843, Caleb Eddy proposed that the Proprietors might still make the Middlesex Canal a profitable enterprise if they turned the canal bed into an aqueduct to supply Boston with drinking water. Only the section from the Concord River scuth would remain open to provide water for Boston. Eddy went so far as to have the water analyzed and to obtain a cost estimate of $900,000 for the project. Needless to say, the Proprietors never acted on the Eddy proposal.[15]

Receipts shrank even further. In 1843 only $12,000 was collected; in 1849 revenue was down to $3,400; and by 1851 the receipts barely totaled $1,200. In light of this, the Proprietors voted: "That the directors...are...instructed to ask the grant of suc.. privileged and rights...as will enable them to convert their property into such form as to make it distributable among the corporators before it shall be totally sunk by the present discouraging conditions of their affairs."[16]

Nathan Hale had been right when he wrote, February 11, 1826:

> Railroads are much better adapted to the needs of Massachusetts than are the canals Massachusetts has long winters, the railroad can operate all year round Massachusetts has mountains; the railroad, which costs half as much as a canal in areas with an average amount of lockage, costs proportionately less in mountainous areas because the means for overcoming the elevations are far less expensive than the building of locks or a canal Finally, the railroad, like the canal, would be available to use for all, anyone would be able to use the line simply by having the wheels of his cart fitted to the railroad ''

The courts took nine years to decide that the Proprietors had ceased to enjoy their rights. By this time, the company had practically disbanded, the bridges had been removed, and much of the canal bed had been filled in. Finally, on April 4, 1860, the General Court of Massachusetts declared that the privileges of the Proprietors of the Middlesex Canal were forfeited and annulled. In addition, the General Court requested that all records of the canal company be delivered into the hands of the Clerk of the Middlesex County Court. The shift in economic life within the nation had once again isolated Boston and New England.

[1]Boston Public Library, *Middlesex Canal Scrapbook* (Boston, n d)

[2]*Ibid*

[3]William A Mercirn, "Public Documents Relating o the New York Canals. Which Are to Connect the Western and Northern Lakes with the Atlantic Ocean, 1821," *Canal News*, Vol 2, No 1 (April, 1864)

[4]John Langdon Sullivan, *Remarks on the Importance of Inland Navigation From Boston by the Middlesex Canal and the Merrimack River in the Present and Probably Future State of Foreign Commerce* (Boston John Elliot, 1813) p 7

[5]*Ibid*

[6]Commonwealth of Massachusetts, *Massachusetts Statutes Private and Special* (Boston, 1815), Vol IV, 310

[7]John Langdon Sullivan, "Letter #3," in *Letters First Published in the Boston Daily Advertiser in Answer to Certain Inquiries Relative to the Middlesex Canal* (Boston *Boston Daily Advertiser*, 1818), p 8

[8]John Langdon Sullivan, *Annual Report*, January 31, 1816, p 2

[9]*Ibid*

[10]*Annual Report*, January 26, 1829, cited in Roberts, *Middlesex Canal*, p 153

[11]Alvin F Harlow, *Steelways of New England* (New York Creative Age Press, Inc , 1946), p 19

[12]"Remonstrance of the Proprietors of the Middlesex Canal Against the Grant of a Charter to Build a Railroad from Boston to Lowell, February 12, 1830," reprinted in Caleb Eddy, *Historical Sketch of the Middlesex Canal* (Boston Samuel N Dickinson, 1843), pp 28-29

[13]*Corporate Records* cited in Roberts, *op cit* , p 170

[14]"Report of the Proprietors," *Ibid* , p 172

[15]Eddy, *op cit* , pp 6 15

[16]*Corporate Records*, December 11, 1850, cite f in Roberts, *op cit* , p 187

[17]Julius Rubin, "Canal or Railroad?," *Transactions of the American Philosophical Society*, Vol 51, Part 7 (1961), p 82

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