

The Medford Historical Register.

VOL. XII.

JULY, 1909.

No. 3.

A PIONEER RAILROAD AND HOW IT WAS BUILT.

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[Read before the Medford Historical Society, April 20, 1908.]

NEAR the close of the Eighteenth Century a certain English physician (Dr. Darwin), in a burst of fancy, or was it prophecy, wrote: —

“Soon shall thy arm unconquered steam, afar
Drag the slow barge, or drive the rapid car;
Or on wide waving wing expanded bear
The flying chariot through the fields of air, —
Fair crews triumphant, leaning from above,
Shall wave their fluttering kerchiefs as they move,
Or warrior bands alarm the gaping crowd,
And armies shrink beneath the shadowy cloud.”

Several years ago it was my pleasure to read before this society a paper upon an “Eighteenth Century Enterprise,” and to call therein especial attention to the attempt made to utilize the power of steam in dragging the slow barges along the placid waters of the Middlesex Canal in 1818–19.

Before the first steamboat had made its trips in Boston Harbor, a steam canal boat had been propelled through our ancient town of Medford.

The following season, while the steamboat *Eagle* was making her daily trips from Boston to Hingham, the same steam canal-boat, *Merrimack*, made trips from Boston to Chelmsford, and thence up the Merrimack river to Concord, N. H.

While this particular attempt was not continued as a permanent arrangement, as was then hoped it would be, it proved that the thing could be done. Under more

favorable circumstances, steam does "drag the slow barge," and the great ocean greyhounds seem not to have reached their utmost limit, either in size or fleetness.

But how about the driving of the rapid car? Did I hear some one whisper, "Automobiles now?" Well *they* belong to the Twentieth Century, though I do remember seeing a steam buggy moving along the street in 1868. A few years ago "horseless carriages" were spoken of, but now the new word is written short, *Auto*. The "rapid car" alluded to above is a Nineteenth Century product, antedating what we once knew as "horse-cars," though the first cars that became rapid were drawn by horses. Those cars were *carts*. The T was taken from the cars and eventually applied to the rails of the track the cars (or carts) moved upon, and because of its shape we speak of a T rail. As wagons or carts are drawn along on the roads, so *cars* are more rapidly moved on roads fitted with continuous lines of parallel rails, and such a road is called a rail-road. Prior to 1827 there was no railroad in Massachusetts, the first being then built from Quincy to tide water for the purpose of conveying the granite blocks of which Bunker Hill Monument is built.

Nearly seventy-three years have elapsed since the snort and neigh of the iron horse was first heard across the quiet valley of the Mystic, and a new mode of travel came into use.

The people who today hail the modern trolley car at the street corner, almost at their very doors, join in the grand scramble and push at Sullivan Square, and then good naturedly hang by a strap while squeezed into the Elevated cars for the rest of the journey to the Hub, have little idea of the Medford to Boston railroad or journey in the early '30s.

And they who ride by the Southern Division or Medford Branch trains and alight in the great dingy train-house of the North Station, with its clouds of smoke and steam and puffing locomotives of colossal size, would

note a marked contrast could they see the first steam train which rolled into the little station on Lowell street on June 24, 1835.

During the June session of 1827 (for the Legislature then met semi-annually) Gov. Levi Lincoln in his message urged that special attention be given to the subject of railroads.

This resulted in an appropriation of \$250 for the survey of a route from Boston to Lowell, which latter town had then a population of 6,000.

There were then but 44 miles of completed railroad in the entire country, but 442 miles were in process of building, while 697 more were projected. Truly the fever was spreading.

The public facility for passenger transportation between Boston and Lowell in 1829 was a stage coach, going one day and returning the next. It was a three hours' ride and required an outlay of one dollar and twenty-five cents, but in the winter the charge was one dollar a passage.

The packet boats, *Gen' Washington* and *Gov. Sullivan*, upon the Middlesex Canal for about eight months in the year carried passengers for seventy-five cents, but besides this there was a stage fare of twelve and one-half cents for less than a mile from the terminus in Charlestown and across the bridge to Boston, while at the northern end "a fourpence ha'penny" was charged for two miles when the fare was not "thrown in."

The canal's northern end was in Chelmsford, now known as Middlesex Village and part of the city of Lowell.

The canal's first cost was a half-million, and this had been supplemented by continual heavy expense for repairs, but dividends were being paid.

The Middlesex Canal had been in operation for thirty years when the railroad was chartered. The canal connected the tidewaters of Boston Harbor at Charlestown with the slow moving current of Concord river at North

Billerica by an ascent of one hundred and four feet, then descending twenty-six feet, it connected with the Merrimack, and was twenty-seven miles in length.

As three and one-half miles per hour was the fastest time made by the passenger boats, and twenty locks had to be passed through, it was an all day journey from Lowell to Boston. Besides Lowell was nearly two miles distant from the terminal at Chelmsford, and was non-existent, and not even dreamed of, when the canal was opened in 1803.

Just before this a canal had been opened for the passage of boats and rafts around the Pawtucket Falls of the Merrimack, but the opening of the Middlesex Canal as an inland and more direct route to Boston had proved somewhat disastrous to the interests of the "Proprietors of Locks and Canals," as the Pawtucket Canal Company was styled.

Its disappointments, however, were destined to come to an end. Some mill owners on the Charles river at Waltham were seeking along the banks of the Shawshen for additional power and new facilities, when one, Ezra Worthen, remarked, "If they want water power, why don't they buy the Pawtucket Canal and get the whole force of Merrimack river?"

Strange it was that such a scheme had not dawned on people's thought sooner, and that the Merrimack had flowed on unharnessed, while the Pawtucket Canal had only served for a passage around the Falls for twenty-five years. A word to the wise was sufficient, and quietly the land along the river was acquired, then factories built and the town of Lowell came into existence, with its many and varied industries.

Much had been expected from the experiments with steam power on the canal and river, and a factory was established in Medford for the building of steamboat engines, but success was not to be in dragging "the slow barge" for two-thirds of the year by daylight. The destiny lay along the way of the "rapid car," with every

hour of every day available, in other words, along the line of the *railway*.

The growing town of Lowell, with its manufacturing industries, demanded a more rapid transit than an all-day ride and still slower transportation of goods from Boston.

As railways had been in use for some years in England, and had been built in the Middle States, a railroad was here looked upon as the solution of the problems.

The canal had been a great enterprise in its time, in fact it was the first great engineering effort to be attempted in this section, and was followed by others in various places. One was even projected through Hoosac mountain to connect with the Hudson river.

The Boston & Lowell Railroad was chartered by the General Court of Massachusetts. The petitioners were opposed by the Canal Company, who foresaw that the new enterprise would be a damaging rival and who felt that it ought not to be permitted without some redress. The testimony given and ideas advanced at that time seem singular reading today. As there was a provision in the charter allowing the erection of toll-gates at intervals, it is evident that use of horses was at first intended, and that people might travel in their own cars on its rails as they had over the old turnpike roads.

Having succeeded in obtaining a charter despite the remonstrance of the canal proprietors, the railway company secured a provision that no other railroad should be built from Boston into Lowell within a period of forty years.

As a matter of topographical necessity the railroad followed much the same route as did the canal, save that it took the latter's eastern or original survey through the valley of the Aberjona, instead of climbing the steeper grade through Woburn, though it attained a slightly higher level at North Billerica than did the canal. It is doubtful, however, if at that time it was thought possible to overcome a grade of sixty feet in one mile, as was

done a few years later when the branch to Woburn was built.

By reference to the county map, this peculiarity will be observed. The new line was true to its name, *Boston & Lowell*. The Middlesex Canal nearly traversed and was entirely within the county, hence its name. The railroad passed through the central village of no town in its entire length of twenty-five miles. Its course lay between Charlestown and Cambridge, Medford and West Cambridge, Stoneham and Woburn, Wilmington and Burlington, Tewksbury and Billerica. The traveller that journeys over it today will find the compact city of Somerville, the residential western section of Medford (that once was almost a town itself), and the beautiful suburban town of Winchester grown up on both sides of its course. Possibly his train may take him two miles over the steep grade of the Woburn branch, now extended as the Woburn loop through that city. At intervals the loop follows closely beside the still water-filled channel over which Capt. John L. Sullivan steered the steamboat *Merrimack*, ere the railroad was thought of. As a matter of fact, the grade and embankments of the long disused waterway made possible the extension of the branch railway to the village of North Woburn, as it did an electric road in Wilmington in later years.

When the old waterway was built in the closing years of the eighteenth century, the labor was performed by men mostly native hereabout, and sections of two rods each were let out to a single laborer to dig and embank. A few of these, however, were from England, and the place of their former residence was carefully entered in the superintendent's account book. Almost without exception there appears a charge to each man of a quantity of *rum*, varying from a quart down to a glass, and in some cases a little sugar. There is also the account of expense of "sett of measures" necessary for the accurate dispensing of the said rum, and while it did not take as much rum to build the canal as water to fill it, the entries

in the book are rather formidable. It may be interesting to notice that the average amount consumed was about two shillings' worth per rod.

The railroad was built more largely by foreign labor, and the amount of the "crathur" then consumed cannot be well ascertained, as the work was done under a different system. The canal passed through but few hills, but rather, around them, as seen in the "Oxbow" at Wilmington; but the railroad, though not the straightest in its course, had deep cuts in Charlestown between Prospect and Winter Hills, Walnut Tree Hill in Medford, again through the Brooks estate along the shore of Medford pond, and still again in Woburn, near what was called the Watering Station.

The material excavated in these cuts formed the embankments across marshes and places of uneven grade, and its transportation was done by oxen and horses, as there was then no rolling stock. The science of railroad building was then in its infancy, and the ideas of construction have since undergone much change.

The men of that time deemed that the construction should be of the most solid character and built accordingly. They doubtless thought to profit by the experience of the canal people, who built most of its locks and all its aqueducts at first with wood, and later replaced with stone, as the wood decayed. The railway track in order to be substantial and require little repair, was laid on ties of split granite. These were brought down from Tyngsborough on the Merrimack and through the canal on the canal boats, and delivered at convenient points along the line. Professor Dame in his article upon the canal alluded to this, styling it a case of a "corporation assisting in the preparation of its own obsequies." It did so and more, as will be seen later. There are still many persons who remember these "stone sleepers" which have been entirely removed for thirty-five years. There are very few people, however, that are aware of the construction beneath, which still lies buried there. Beneath each rail of

the outward track (which was the first one built) was laid a wall of boulder (or slate) stone, about four feet in height for the entire length of the road, making fifty miles in all. Across the tops of these walls were laid the granite ties, solid and substantial, that should never wear out or decay. *They* did not but *other things* did. Upon the ties (in which were drilled two holes near either end and these plugged with wood), were placed the iron rails of the "fish belly" type. The rails were (in section) like a letter T, the top about $2\frac{1}{4}$ inches wide and the upright section which gave support to the top varying in width, being the narrowest at the supporting points where this section rested in an iron casting called a "chair." Through two holes in each of these chairs were driven wrought iron spikes into the wooden plugs of the stone ties. Railroads had been built ere this with strap iron spiked on timber rails, the effect of the rolling wheels on the top side of the iron was to curve the same and loosen it also; and an unpleasant feature of primitive railway travel was the "snake's head," or end of a loosened rail punching through the floor of the car, to the passengers' discomfort not to say danger of impalement.

The stone ties were about eight feet long and a foot wide; generally nine or ten inches in thickness, and were roughly split and slightly dressed, to receive the base of the iron chairs. One of these may be seen in Woodbrook Cemetery in Woburn, with a section of one of the original rails and chair bolted upon it. It marks the grave of Waterman Brown, who was employed in the construction of the railway, was later an employee of the company and lost an arm in its service, and ever afterward was continued in its employ. Being a man of natural gifts and a close observer of mechanical matters, he constructed a set of models of the first engines, cars (both passenger and freight), a pile driver with its tread mill for hoisting the hammer, and other railroad appliances, which is a most instructive exhibit of the early days of railroad enterprise in Massachusetts.

A pile bridge carried the rails across Charles river. Miller's river in East Cambridge, and Mystic river between Charlestown and Medford; while granite abutments that still remain buried in the embankment, carried the track at an elevation of nine feet above the water in the canal in the western corner of Medford, adjoining the crooked corner of then Charlestown.* Similar bridges were built where other streams were crossed, and this pioneer railroad was ready for the rolling stock and its opening for public use.

In planning the enterprise it was expected that the road when graded and laid with a single track would cost \$168,000, or if with double tracks \$320,000. It was very soon found that the cost of construction had been underestimated and one thousand shares of stock at \$500 per share were placed on the market. But three hundred and fifty of these were disposed of when the sale stopped, and a little later the corporation came under the control of men who were the "Proprietors of Locks and Canals" at Lowell. By them the road was slowly but surely carried to completion, and it was then found to have cost \$1,800,000, or almost eleven times the original estimate. When completed the Pawtucket Canal Company was at the fore. Its day of triumph over its long time rival, the Middlesex Canal, was at hand. The eventful day came at last, thirty-three years later than the canal opening, a new generation of people to serve and be served, and the first steam train of passenger cars set out and passed over the railroad from Lowell to Boston on Wednesday, June 24, 1835. This direction may seem singular but the writer has the statement from an eye-witness.

The engine was built in England and was there purchased. The writer is informed by credible evidence that it was shipped from Boston,— via the canal to Lowell.

* As a matter of record and because of the changes being made at the present time by the Metropolitan Park Commission be it noted that the canal's location was northerly thirty paces from the five mile post. By their recent change in the course of the river the boundary line between Medford and present Somerville (hitherto apparent) may only be found by survey.

By a casual but fortunate meeting with a grandson of one of the men who there assembled the various parts and got that engine in working order, the writer is also in possession of an interesting pamphlet in relation to the same that gives an authentic account of the difficulties experienced. No plans or working drawings came with the engine, and nothing to indicate their proper location, except some figures in red paint. None of the workmen had ever seen anything of the kind in operation, or otherwise; and learning that somewhere on a short completed *section* of the Worcester railroad there was one in working order, they went to see the novelty. Arriving there, they found it jealously guarded and any nearer approach thereto forbidden. Nothing daunted however they returned to Lowell and set about their task anew. Frequently they found that parts which fitted together apparently, required to be taken apart that some other might be properly adjusted; but they at last succeeded, and the engine was ready for duty.

It was the writer's opportunity to ride over the Elevated structure in Boston on the day of its opening, to be one of the crowd that taxed its capacity to full extent and to preserve one of the Boston dailies containing an account of the same. What would those Lowell railroaders say to the modern opening? This is what, and all, the *Boston Advertiser and Patriot* of June 24, 1835, said of that one.

“It will be perceived by the advertisement of the company, that the cars are to commence their regular trips on this route for the accommodation of passengers to day” —

The advertisement dated June 27, was not printed till June 29, and was as follows.

“BOSTON AND LOWELL RAIL ROAD.

The cars will continue to run till further notice, as at present, viz.

Leave Lowell at 6 A.M. and at 2½ P.M.

Leave Boston at 9 A.M. and at 5½ P.M.

No Baggage can be taken except what belongs to passengers. Allowance to each 40 lbs.

As soon as burthen cars can be provided, notice will be given for the transportation of merchandise.

Tickets may be had at the depot corner of Leverett and Brighton Streets. Price \$1. each.

GEO. M. DEXTER. Agent.

BOSTON, June 27, 1835."

On June 23 appeared an item in the same paper that is of interest.

"Lowell Railroad. The mail was brought from Lowell today for the first time on the railroad—time, one hour and a quarter. Tomorrow the cars commence running for the public accommodation, making two trips a day from each terminus."

By the above extract it will be seen that freight cars were not then ready, and the stories that used to be told were to the effect that but a limited number were expected to be necessary for quite a term of years.

It is with a feeling of sadness that we find recorded in the evening *Transcript* of June 25th, the next day after the railway's opening, the following.

"ACCIDENT. A young man, by the name of David Danforth, about 22 years of age, was killed on the railroad this afternoon, about 4 miles from this town. The locomotive, *Patrick*, manufactured [assembled] in this town and just put on the road, with a train of cars, was returning from Boston, Mr. Danforth standing on one of them, his head struck against a bridge over the road with such force as to kill him almost instantly.

Lowell Courier."

Soon after the opening of the road for business a second track was begun. The method of construction for a few miles probably at the Boston end was the same as before. Then the building of the stone walls was discontinued as it was found that they were too rigid and unyielding, and later still the use of granite ties or sleepers was discarded, as these proved unsatisfactory, wearing the rails from beneath much as did the passage of the wheels above. Thus it proved that the less durable material, wood, with which the granite was gradually replaced, proved the better. This latter, however, was a process of years.

A second engine was imported from England, and set up as was the first, but with much less difficulty, and was placed in charge of the workman who prepared it for use. This was little to the liking of the English engineer who was in charge of the first "locomotive," and who was anxious to bring over from England one "who was competent." He foresaw only trouble and disaster should it continue in such inexperienced hands. And sure enough the grim prophecies were realized in due time. With many "I told you so"s the imported engineer repaired the difficulty, adroitly concealing the real trouble and process of repair by various useless maneuvers. The difficulties becoming chronic, the suspicions of the Yankee engineer were aroused. Concealing himself in the engine house over night, he saw enough to warrant all his suspicion. As usual his associate repaired the difficulty, and commented on the folly of entrusting such an intricate machine to unskilled hands. A little later *two* men witnessed the night tampering, and the next day and thereafter there was a different man in charge of the *first* locomotive and the former engineer was in search of a situation. In a few years good locomotives were built in the Lowell machine shops, a vast improvement over those imported, whose cylinders lacked three-eighths of an inch of being circular in form.

Those first imported locomotives would contrast queerly with the great steel monsters that thunder along the tracks today and whose boilers are entirely above the driving wheels. Equally great would be the contrast the cars would present both in size and design, while style of finish and convenience is hardly to be compared. The first engines had no cabs to shelter the engineer or fireman. After a time a sash or framework with glass was placed before them, which was some protection from the draught formed by the rapid movement of the engine.

The fuel burned was wood (mostly pine), and the tender or watertank attached, though piled high at the start had to be replenished on the way with both wood and water.

Consequently the station at Woburn (now known as Walnut Hill) was for years called "Woburn Watering Station." Great sheds 40 x 100 ft. were then located on either side the tracks and filled with cord wood sawed "twice in two" by horse power machines; while in the hill above was a great cistern from which the water was supplied to the engine tank.

The original engine is said to have been given (in England) the name of the noted English engineer Stephenson. It somehow acquired the nickname (from people along the route) of *John Bull*. The second was named *Patrick* in honor of the president of the road, Patrick T. Jackson. The proposition to call it *Jackson* did not meet with favor from the Whig proprietors, as "Old Hickory" had a more than local reputation, so *Patrick* it was, as a compromise.

It was the custom of those days and is still in some sections to name an engine, as now are the Pullman cars, warships, and merchant vessels. In this nomenclature all sources were drawn upon. The officers and prominent men of the corporation were remembered, and *Patrick*, *Whistler*, *McNeill*, *Jesse Bowers*, *Wm. Sturgis*, *Daniel Abbott*, *Higginson* and *Storrow*, shared honors with the Indian chiefs *Paugus* and *Pennichuck*. Sentiment found expression in a *Factory Girl*, *Sailor Boy*, and *Leader*. The counties of *Suffolk*, *Essex* and *Middlesex*, all the towns along the line as well as the terminal cities were each represented. The Bible furnished the names of *Goliath* and *Samson* and heathen mythology was laid under tribute, furnishing *Hector*, *Ajax*, *Vulcan*, *Mercury*, *Mars*, *Vesta*, *Hercules*. Count *Rumford* had a namesake, also the Peruvian hero *Rolla*. The bird of freedom was n't forgotten for there was an *Eagle* as also a *Lion*, *Tiger* and *Leopard*. A whole menagerie.

Of course it will be understood that these enumerated were added as the years passed and business increased. Some were of a type now disused, called inside connection; *i. e.*, the cylinders were close together under the

front end of the boiler, and these required a cranked axle for the forward pair of driving wheels. Nearly all were resplendent with a wealth of brass work which made the fireman's position one of strenuous work to keep up the shine.

Till the use of coal for fuel began, all had immense conical smoke-stacks, some four feet in diameter at the top, and most all had an iron rail extending from the cab around the entire machine, so that in passing around, the engine-men might not fall overboard.

By 1850 the engines were all provided with cabs for their occupants' shelter from storm. The method of water supply was by a force-pump that derived its power from the motion of the engine, and this method was in use as late as 1865.

Not till about 1857 was coal used for fuel; it did not come into exclusive use on this road till ten years later, and with its adoption the smoke-stacks were changed in form and decreased in size.

The cars were of first and second class, and were entered through doors at their sides. After a time the second class cars had a compartment for baggage and express parcels. In this class the seats were fixed back to back, half facing each way, and there were no cushions. Those of the first class were entered as now at the end from a platform, and had a slightly curved roof and were high enough for a man to stand upright in if he was n't too tall or did not wear a stove-pipe hat. They were very well lighted, as the sides were mostly windows of small panes of glass that rattled merrily. The seats were arranged in the present manner and were upholstered in black haircloth. Sheet-iron stoves of the kind known as air-tight, placed at the middle of one side, *heated* the portion nearest them, warmed more remote parts, while the ends of the cars partook of the outdoor temperature. Ill-smelling lamps, that burned sperm or whale oil, made the darkness visible when night came on apace. This description applies to cars in use from '52 to '65 approximately.

The writer has seen a few of the earlier cars, probably of the second type, in use. When discarded they were sold or parcelled out among employees of the road to be used by them for various purposes: woodsheds, hen-houses, children's playhouses, and the like (minus wheels, however). They resembled very much the old style street cars and omnibuses, except that the doors were at the sides. Old pictures show the "first steam train in America" on the Mohawk Valley Railroad with stage coach bodies mounted on a frame and wheels, adapted to the rails.

The first type of car in use on the Boston & Lowell was a box-like structure with a seat on, or rather in, the roof, with a projecting platform or foot-board just below, and these at either end. To these the brakemen and conductor climbed in all kinds of weather and operated the brake in stopping, by means of a long lever. The sills of the car projected somewhat at each corner and were padded with leather, and a short chain of three links coupled the cars of the train together. As these made trips only by daylight there were probably no lamps, and they were probably discarded for the second type before 1850, and perhaps earlier.

By the time the third type came in use it was the correct style to have the words "Lowell" or "Woburn Branch" in metallic letters about a foot high on each side the car above the windows.

The Boston terminal was at the foot of Lowell street and there continued till late in the '50s. The writer's first knowledge of it was in '53, and just before the departure of a train an employee would shout "Ca-a-rs ready for" and enumerate the various stops to be made. Later there was a bell rung instead.

At Woburn Center (the branch was opened with one train each way daily on December 30, '44), that being a terminal, there was a bell in a little cupola on the roof. This was rung for three minutes, beginning fifteen minutes before the time of the train's departure. This was attended to by the station agent or brakeman.

At the time of starting the conductor would be at the bell rope with watch in hand and solemnly toll with measured strokes for two minutes. When the second hand "got on the dot" he would give the rope a special pull that the bell had a special way of responding to, and shout "All aboard" and the train would pull out.

It was somewhat amusing to the writer to see the latest comers rush into the station at the last instant and scurry aboard the cars often when well under way. It was n't so funny however for himself to run with one of those two story dinner pails as he sometimes did for forty rods, hoping the bell would continue to toll; and perchance be left behind to wait an hour for the next train.

Medford residents of those days will recall the ringing of the bell on the Medford Branch depot by the ticket seller, who dealt out tickets and made change to the late comers; and there were late ones in Medford as well as Woburn. The writer remembers watching from the car window in Winchester some of these dilatory ones, one of whom was generally buttoning on his dickey and one morning was in his stockings with his boots hanging over his arm,—but he got there.

The tickets sold by the station agents on the Lowell road were a curiosity. Of stout card board of different colors; on one side the name of station, on the other a series of hieroglyphics resembling Chinese characters. This last was the brilliant idea of one of the railroad officers to prevent their being counterfeited. The conductor was supposed to know everybody and discriminate at once between transients and season ticket holders. The latter were allowed one passage each way daily, but the rule was not rigidly enforced.

The stations in our city were known as "Medford Steps" and "Medford Gates." There are as many steps at the former now as then, perhaps more, but for over twenty years it has been known as Medford Hillside. The "Gates" has been West Medford for more than fifty years. The name was appropriate however.

At all grade crossings were placed huge posts with a broad sign board spanning the street, bearing the legend, "Railroad crossing, look out for the engine while the bell rings." As everything was of substantial character the letters were of iron, and once painted black. Sometimes a screw had loosened and an iron letter was missing, or hung dangling aloft, a menace to the passers beneath.

The gates were on both sides the track and when opened after passage of a train barred entrance to the tracks. After a time they were removed and a flagman stationed at some crossings while others were left unprotected. The present form of gate now so universally used was installed in 1878, and everybody knows "faithful Mike" at the High street crossing.

Though the first bridges across streams were of wood, they ere long were replaced by stone, and the old arch over the Mystic was a notable one. During the past year it has wholly disappeared from view, but it still remains intact, — there is nothing lost when we know where it is — but X rays will not reveal it. It is completely buried, — enveloped, entombed as it were — in the new, wider and smaller arched structure of modern reinforced concrete over which the heavy traffic of today rolls along; and is there to stay. A similar treatment of concrete has been applied to the "six arch bridge" across Concord river.

Soon after the railroad was built, some one evidently impressed with the importance of the locality and the engineering feats there accomplished, painted a picture and labelled it as well (and it was well that it was labelled) "Junction of Canal, Railroad & River in Medford."

Some allowance must be made for the artist's flights of fancy, while we respect the motive that prompted the effort, and we may well be thankful that the modern camera preserves beyond question the appearance of modern structures. At this same point the railroad has just been raised some four feet higher, and a fine concrete arch is now completed, under which will be built the Mystic Boulevard.

In Medford, (then) at the crossing of the Aberjona, was an arch of stone which in '52 was destroyed by the ice-jam of a spring freshet which formed against the massive granite aqueduct of the canal. The rising flood lifted the arch, loosening the keystones, and allowing the whole to fall just after a train had passed safely over.

Two arches of dressed granite carried Central street in Somerville and Salem street in Woburn over the railroad. The latter is just north from the Walnut Hill (or watering) station, and is of the style known as the return arch. The former was a segmental arch springing from perpendicular abutments, and was some twenty years ago removed, and replaced by a modern steel structure.

In the early days these and all over-head bridges were sources of great danger to the employees (as witness the fatality of June 25, '35). Modern ingenuity forty years ago devised a simple and effective safeguard in the shape of a rod pointing over the track, which hits the endangered one a warning tap ere the bridge is reached.

With increasing traffic have come larger and stronger engines, larger and more convenient cars, with heavier and longer rails of steel; then the appliances of safety—of automatic brakes and block signals.

I have endeavored to write something of our first railroad and how it was built. To some of us it doubtless seems as if the road was always here, but there are still some in our city who remember its earliest days, for it is but seventy-three years old. There are possibly more that can remember riding in the "rapid car" while (not steam but) horses dragged "the slow barge" along the canal by its side in various places. For seventeen years this was kept up, for the canal company put up a plucky fight, but steam finally won. But for the monopoly secured to the railroad by the forty-year clause in its charter, it would have been possible for the canal proprietors to have laid rails on their embankments and proved whether there was truth in the saying, that competition is the life of trade—or no. After the expiration

of those years, the Boston & Maine laid a track from their line into Lowell; and not to be outdone the Boston & Lowell built also a branch from their Wilmington station into the city of Lawrence. These branches though a convenience to the public, detract but little from the direct stream of travel and business along the original lines. I can myself recall seeing the last of the canal boats, earlier than my memory of the railway cars. Even as late as 1879, I can remember seeing the slowly decaying wood work of the Shawsheen and Maple Meadow aqueducts during my rides to and from Lowell.

This paper has been written at the canal's "landing number four," and during its preparation, cars have thundered by on the high embankment behind my dwelling in a way which that English engineer little dreamed of. In front, where once the canal boats were floated in the aqueduct twenty feet above the river, the largest cars of the Boston Elevated rush along by the electric current, each one carrying as many as a whole train drawn by the *Patrick* in 1835.

The site of the "landing" is covered thickly with dwellings to the north, while southward is the shining Mystic. But in the march of improvement even the natural features change. Before the snows of another winter shall have covered the brown marshes, the pulsating tides will have overflowed them their last, and by another spring time Capt. Sullivan's dream in 1819 of river navigation, after ninety years will have come to pass. Steam you ask? Possibly, but more likely gasoline or electricity. Dr. Darwin wrote of "flying chariots in fields of air" and the artist of 1835 alluded to, had in that picture a balloon. The realization of those I willingly leave to the people of the future. Terra firma is good enough for me. There are possibilities in air-ships and submarine boats, however. Perhaps the Historical Society fifty years (or less) hence may consider them.