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CONSTRUCTION OF THE ALBANY & SYRACUSE RAILROAD:

a study in early engineering

by Richard F. Palmer

The construction of the Auburn & Syracuse Railroad in the mid-1830s forms an interesting chapter in the history of development of internal improvements in central New York. From the beginning, it was an Auburn project. The idea of connecting this then thriving community with the Erie Canal had been the principal topic of discussion by promoters as far back as 1828. The original idea was to build a railroad from Auburn to either Port Byron or Weedsport. Various schemes, which included the incorporation of a number of railroad and even canal companies fell through and it wasn't until 1832 that the matter was given real serious consideration.

Lobbying in Albany, with the aid of then State Senator William H. Seward, resulted in the incorporation of the Auburn and Syracuse Railroad on May 1, 1834, with a capital of \$400,000. Henry Hall, in his 1869 "History of Auburn," said the venture began "existence under inauspicious circumstances. The construction of the railroad from Auburn to Syracuse was, from the broken nature of the ground over which a large part of it must necessarily pass, and from the retired and unfavorable location of Auburn, regarded in many places as an act of unspeakable folly. Hundreds prophesied the total failure of the enterprise, predicting that every dollar invested in the road would be a positive loss." (Hall 1869:196-201)

Prior to incorporation, a preliminary survey had been made by two surveyors at the request of an exploring committee. They reported that pursuant to instructions "we commenced our survey and levelling at the prison running thence in a north-easterly course 13 1/4 miles to a point on the Nine Mile Creek feeder, two miles south of Camillus Village, being 250 feet below the village of Auburn." They reported "the route from thence to Syracuse is favorable, as, by reference being had to former surveys and estimates by the Canal Commissioners and others..."

"The soil," they said, "for a distance of 13 1/4 miles, as above, is in our estimation favorable, being along the descent of a ridge through much of the route, where gravel and limestone may be had in abundance." (Anon. 1834)

The company was organized on January 20, 1835. Stock subscriptions were quickly taken up. The engineering department was organized the following April, the Chief Engineer being Edwin F. Johnson. That summer Johnson, assisted by Levi Williams, the resident engineer, prepared the necessary surveys and examinations preliminary to the location of the route (Hall 1969:196-201). The line of the road was fixed on August 22, 1835 and on September 11, certificates of location were filed with the clerks of Cayuga and Onondaga counties (Anon. 1837b).

With the preliminaries out of the way, Hugh Lee, another civil engineer of note, proceeded to prepare the work for the contractors. A depot, not unlike a political wigwam of later years, was erected near the southeast corner of Van Anden and State Streets in Auburn. Work was thus begun and vigorously executed the ensuing fall and winter, under the capable supervision of Colonel Levi Lewis, the

superintendent(Hall 1869:196-201). On August 22, 1835, Johnson advertised for bids for grading, masonry and bridges. Bids would be received until October 15 at noon. Plans for the different structures were available for examination at his office in Auburn. Work commenced almost immediately and by May 1, 1836, \$20,000 had been expended for construction (Anon. 1837b).

On October 16, 1835, the directors of the company asked the consent of the Canal Commissioners to construct their railroad four rods nearer to the canal in Syracuse than specified in the charter. This was between Harbor Brook and West Street. The owners of the land west of Onondaga Creek offered to open a street 100 feet wide between the canal and the railroad. This street later became known as Auburn Street (Anon. 1835).

In January 1836, proposals were received, and contracts made for the delivery of timber for the railway superstructure, in quantities sufficient to construct a single track. These contracts were, like those for the grading and masonry, executed on favorable terms (Johnson 1837).

Specifications called for the furnishing of one million board feet of Norway pine for rail timbers, 5.5 by 6.5 inches, in lengths of 18, 21, 24, and 27 feet, or the same amount and same dimensions in yellow pine.

Also called for were one million board feet of bed timbers of white cedar or chestnut, 4 by 8 inches, not less than 14 feet long, or the same amount in hemlock, 4 by 8 inches, not less than 18 feet in length.

Specifications also called for 50,000 crossties of white cedar, chestnut, white oak, or red beech 5.5 by 6.5 inches, 8 feet in length, and framed ready to receive the rail timbers. Three-fifths of the timber was to be delivered by November 10,



Flask reading, "SUCCESS TO THE RAILROAD" from privy 39, Rome, N.Y. Olive green glass, 17.3 cm.

1836 and the remaining two-fifths by June 1, 1837, and deposited along the embankment, or along the south bank of the Erie Canal between Weedsport and Syracuse. The two portions first delivered were to have been cut previous to March 15, 1836, and the balance either within that time or between November 15, 1836 and March 1, 1837.

As usual, the timbers were to be of high quality, free of knots and sap, except perhaps along one edge where it was not to exceed 1.5 inches in width.

Experience soon showed that the heretofore peculiar method adopted of placing the work under contract saved the company from payment of extravagant prices for labor, while on the other hand lessening the hazard of loss on the part of the contractor, resulting from error in judgment (Johnson 1837).

The company very wisely chose to adopt standard gauge (4 feet 8 3/4 inches) for the track, since it was to be a link in the chain of railroads from Albany to Buffalo (Johnson 1837). Giving a few statistics, the exact distance from the depot in Auburn to the site of the then contemplated depot in Syracuse was 25.73 miles. The total descent in that distance was 271 feet, making an average descent of 10.54 feet per mile.

The maximum inclination of the grade line was 30 feet per mile. This extended only 8,600 feet, or a mile and a half, on the west side of the Nine Mile Creek valley. Generally, the railroad was uniformly straight, 62 percent being on tangent (Johnson 1837).

To tap the resources of the mills along the Owasco Outlet the railroad constructed a spur running from the main line down Garden Street in Auburn, thence over Franklin to Seminary, then over Seminary to Genesee St., where a freight station was built. To get through the streets, curves of 400 foot radius were employed (Von Gerstner 1842:145-153).

This line was abandoned in 1841 after a permanent station was built at Chapel and State streets.

Oddly enough, Mr. Johnson gives very little detail on the description of the rail structure itself. Information of this sort is not readily available in what could be termed the "standard works" on early railroad construction. However, of the 28 railroads completed or in progress by the end of 1839, only one, the Long Island, employed conventional "T" rail (Klein 1840:227).

Wood was used primarily due to the scarcity of iron at the time. Mudsills measuring 6.5" by 5.5" or 8" by 4" were placed in trenches. On these, crossties were laid three feet apart. The ties were eight feet long and six by six inches, hewed out in the middle and the ends tapered down.

Wooden stringers 5.5" by 6.5" were fastened with wedges by securing them in the notches in the crossties. The mudsills and stringers were yellow pine, crossties white cedar and wedges red cedar. The wedges were three inches across, 12 inches long and 1 1/8 inches thick on one end and 1/8 of an inch thick on the other end (Von Gerstner 1842:145-153).

Financial troubles precluded the use of strap iron rails for the time being, and wooden ribbons and horsepower were to be used temporarily until the iron could be procured (Anon. 1837b).

The Auburn & Syracuse Railroad was hindered greatly by the Panic of 1837, and it was only through sound management that the project reached fruition.

Due to extreme advances in prices and the inability to secure sufficient funds, the board of directors, on June 5, 1837, authorized the treasurer to issue notes at six months bearing interest, in sums not less than \$5.00 to an amount not exceeding \$100,000.

Thomas Y. Howe, the treasurer said this was done "preferring to proceed with the work rather than to

abandon it after the expenditure of so much money. " According to Howe, this was done at the request of the creditors and contractors to prevent them from being ruined (Anon. 1837b).

Howe continues the issuance of notes was due to the "general derangement" of business in the country and the difficulty of enforcing the payment of installments on the stock. "At the same time," he said, "an arrangement was made with the greater part of the stockholders to execute their Notes to the Treasurer for installments, which notes were collateral to the stock and were considered additional security for the payment of the Notes issued by the Company." Mr. Howe's letter book indicates that the stock was soon transferred by local people in blocks to New York and foreign investors.

The company found itself forced to seek other means of support. The Auburn & Syracuse was one of five railroads given loans by the State of New York. The State had pledged its credit to some \$4,600,000 in loans by 1839 (Klein 1840:221).

Finally the State Legislature passed an act of April 18, 1838, granting a loan of \$200,000. The company was to receive \$100,000 in State Bonds as soon as \$300,000 of the working capital had been expended; \$50,000 more as a second installment when a like amount had been spent from the working capital, and the final installment in like fashion. These bonds bore interest of five percent, payable quarterly (Anon. 1838)

The bonds matured in 20 years and if the company defaulted, the State had the right to foreclose and sell the property to the highest bidder. Fortunately, this never happened. With the aid of the notes and the State Loan, the company was able to pay off the debts and finally complete the road (Von Gerstner 1842: 145-153).

Mr. Johnson, in his report, said the passage of the deep valley of the Nine Mile Creek constituted the most formidable obstacle encountered during construction.

It was an obstacle which could not have been avoided. At first, the substitution of a bridge for an embankment was discussed. Mr. Johnson said, "Had this plan been adopted, the elevation of the bridge must have been not less than about eighty feet, as the surface or grade line of the road was depressed some twenty five or thirty feet to obtain material from the banks on either side to form the embankment."

But Mr. Johnson's opinion was that the fill would be cheaper in the long run and the company would not have derived the benefits resulting from the excavation of vast deposits of gypsum.

Although short on cash, the company managed to struggle along with construction through 1837. The earthworks were finally completed in November 1837, and as fast as this was done, the tracks were laid. Oak strips called battens, three inches wide and a half inch thick, were nailed to the wooden stringers instead of the strap rail (Von Gerstner 1842:145-153). Except for a section of about five miles on the eastern portion, the railroad was ready for operation, and an inaugural run was made on Christmas Day (Anon. 1837a).

The president and several directors, along with invited guests, making a party of 50, climbed aboard the two 24-capacity cars, and the horsedrawn train left Auburn at 11:20 a.m.

Forty-nine minutes later and eight miles from town, the horses were changed, and continued five miles farther, which at that moment was as far as the train could proceed. After returning a short distance the party partook of refreshments, arriving

back in Auburn at 3 p.m. Exclusive of stoppages, the average speed was 10 miles an hour and the horses were provided by a local stagecoach proprietor.

The company decided it was in their best interests to contract out the use of the road upon liberal terms to the stage proprietors to eliminate competition and put practically all the public travel over the railroad. Col. John M. Sherwood, the local proprietor, was to receive half the receipts from freight and passengers (Howe 1838).

The first official trip to Geddes took place on January 8, 1838. Five cars crowded with passengers left Auburn at 9:30 a.m., and were met halfway down by another car, which had been brought out from Syracuse, which returned. The Cayuga Patriot of January 10 noted that some 40,000 tons of gypsum, with a value of \$150 a ton, was piled along the line. The train arrived in Geddes at 12:30 p.m. and the passengers disembarked for the Syracuse House in carriages for the traditional inaugural feast. The train returned to Auburn at 8:45 p.m.

The Auburn & Syracuse Railroad was authorized to carry both passengers and freight, a luxury denied to other railroads which paralleled the canal more closely. The company, however, was obligated to pay to the State the same toll which was collected at that time for freight on the Erie Canal. A later amendment to the charter changed this so that the toll would only be charged during the duration of the canal navigation season (Von Gerstner 1842:145-153).

It might be interesting to insert at this point a description of conditions by an early passenger on the Auburn & Syracuse line:

"... On the following morning, Thursday, August 9th, (1838) we left Syracuse in a coach that conveyed us to a railway, beginning at a distance of

of three or four miles from the town, to take us to Auburn; but great was our disappointment at finding that, instead of a locomotive engine, the cars were drawn by horses, of which there were only two to draw about twenty passengers, the horses being placed one before the other, as tandems are driven, and not abreast. The rails, too, were of wood instead of iron, and the rate of travelling was estimated to be about six miles an hour. We had to wait half an hour before starting, and our progress was then so tedious that we thought of getting out to walk the distance, as the most expeditious mode of the two, when, to add to our mortification, we met a train of cars drawn by a single horse coming right against us, and, the rails being single and the places for turning off being wide apart, we had to shift our tandem pair from the front to the hind part of the train, and be drawn back about a mile and a half to get off the track, and let our advancing rival go past us.

After a very tedious ride of four hours in performing 22 miles, we reached Auburn."

(Buckingham 1841:128-129)

Little by little, the wooden ribbons, or battens, were removed and replaced with strap iron rail measuring 2.5" by three-quarters of an inch and two locomotives were ordered from Rogers, Ketcham & Grosvenor of Paterson, New Jersey. These were the "Syracuse" and the "Auburn" and were small affairs, weighing about 10.5 tons, with single drive wheels. They were of 4-2-0 wheel arrangement.

The inaugural steam trip was made on June 4, 1839 (Anon. 1839). The party consisted of nearly 200 people. By this time the railroad had been completed into Vanderbilt Square in Syracuse, into the newly-erected Syracuse & Utica station.

A temporary depot had been put up between Salina and Clinton streets in horsecar days, but was removed upon completion of the new building (Anon. 1838b).

The substructure, or embankment for the railroad was built for double track operation, except for three miles. Next to the 700-foot fill next to what is now Martisco, the biggest job was excavating a stone cut along a hill for a distance of two miles in the vicinity of Camillus. The railroad was carried over streams by stone arches, many of which still remain today.

During the construction, the daily wage for a common laborer was between 75 cents and a dollar a day. A man with a team was paid \$2.00 to \$2.50 (Von Gerstner 1842: 145-153).

Buildings on the line included the depot at Auburn, a stone enginehouse at Auburn, a warehouse in Syracuse along the canal, and rental use of the Syracuse and Utica station. Between Auburn and Syracuse were three water stations. At "Halfway" was a tavern, adjacent to which was stored the railroad's supply of wood for fuel in locomotives. All told, the company at its outset employed 38 full-time men. Those paid on a yearly salary were the superintendent, \$1,200; resident engineer, \$750; collector in Auburn, \$500; and chief machinist, \$1,000.

Because the railroad was essentially completed in 1839, I will end my account at this point.

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