

Ann Norton Greene
The Maintainers

"Success as 'Failure': Historians, Engineers, and Maintaining the Erie Canal"

Americans have always been proud of creating new infrastructures, but less enthusiastic about maintaining them; we are now at a point where most of our national infrastructure is in trouble. Googling the phrase “infrastructure crisis” produces dozens of results. In 2013, the American Society of Civil Engineers issued a report card on America’s infrastructure in 2013. In sixteen categories of infrastructure, grades ranged from one B- (Good) to D- (Poor). Eleven out of sixteen grades were in the D range, and four were in the C range (Mediocre) for an overall GPA of D+. As a nation, maintainers we are not.

For those of us who see themselves as “maintainers,” the stakes are high. We cannot get out of this mess doing the same things that got us into it; for historians, this means being looking at how historians have written about infrastructure--what they focus on, how they talk about it and whom they write for—and doing what we can to change it. We often cede the field to popularizers who emphasize innovation and invention, promote technological determinism, and marginalize maintaining in American history.

I offer the Erie Canal as an example of how this happens. The Erie Canal is one of the most successful infrastructures in American history—yet ends up being described as a failure in the historical literature. How did success become failure?

Most people know what the Erie Canal is, but ask someone if the Canal is still in operation and chances are the answer will be no. I have posed this question to professional historians, grad students, undergraduates, relatives, history buffs, casual acquaintances, and, most recently, my guitar teacher. When I ask why they said no, more often than not they answer, “because of the railroads.” When I say that the Erie Canal is still in operation, they are surprised, and sometimes incredulous. “Why?” they ask. “What for? It’s obsolete.” They believe this because all the literature tells them so.

An overview of Erie Canal history:

The Erie Canal was constructed by the State of New York between Albany on the Hudson River and Buffalo on Lake Erie. It replaced slow, laborious, and expensive overland travel with a fast, cheap, and direct water route between the Great Lakes and the Atlantic Ocean. It provided access to the Ohio River valley and the upper Midwest, opening those regions for settlement and development. It funneled commerce away from Lake Ontario and Montreal to New York City, leapfrogging that city ahead of its seaboard rivals in size and importance. It created an urban industrial swath across upstate New York, accelerated agricultural decline and industrial growth in New England, and promoted the development of Northern sectional identity along an east-west axis. The Canal was an immediate financial success, and toll revenue recouped the cost of construction within twelve years.

In addition to its political and economic effects, the canal in of itself was a spectacular physical achievement—the original canal was 363 miles long, forty feet wide and four feet deep, dug with picks, shovels, plows, scrapers, human muscle, and draft animals. It comprised a far-flung infrastructure that included eighty-three locks, eighteen aqueducts, and more than 350 culverts, plus towpaths, feeder canals, canal basins, side cuts, cross bridges, waste weirs, escape hatches, weigh locks, and some innovative engineering solutions.

Heavy traffic led to the original Erie Canal being widened, deepened and straightened during the 1840s and 1850s, and the system expanded with the construction of nine lateral canals that extended a canal network across upstate New York. This version is called the Enlarged Erie. In the early 20th century, between 1905 and 1918, the state rebuilt the Erie Canal as a Barge Canal, larger, deeper, and re-routed to utilize rivers and lakes. It handles both recreational and commercial traffic, though the latter peaked in the 1970s.

The Erie Canal has been in continuous operation for 191 years, and the vast majority of the literature addresses the first thirty years. Every year, more new books tell the story of the Erie's invention, construction and immediate impact. A quick scan of Library of Congress holdings shows ten books on the building of the canal in the last five years (many of them for juveniles—in the way that older technologies get infantilized). In the last ten years there have been two popular trade histories about the construction of the Erie Canal, Peter Bernstein's *Wedding of the Waters: The Erie Canal and the Making of a Great Nation* (2005) and Gerald T. Koeppl's *Bond of Union: Building the Erie Canal and the American Empire* (2009).

The politics, construction and success of the first Erie Canal make a great story, one that has all the components of our favorite stories—it has a quest (build an impossible canal) heroes (young Americans) older wise men (DeWitt Clinton) obstacles and setbacks (money, politics, natural forces and geography) a higher power (an invincible can-do American spirit of progress) and happy resolution. It is, in short, Star Wars.

In contrast, there is virtually no literature about the canal after 1860. In the postbellum period, the “gateway” role of the Erie Canal diminishes, and it drops out of the national narrative. It becomes a different kind of story. But for most historians, it becomes merely a technological artifact, a mode of transportation. The Canal then falls victim to what Robert Fogel named “the hegemony of the railroads” as default explanations of historical change in the nineteenth century. Historians write that the Canal lost business to the railroads, couldn't compete, and got put out of business. The canals, which had been such a good idea earlier in the century, were now a terrible idea—the Erie Canal represented a sad or foolish adherence to an obsolete technology. Mark Twain once wrote that the surest way to convey misinformation is to tell the strict truth, and this applies to saying that the railroads put the Canal out of business. The railroads certainly hurt the Canal—but it did not necessarily have to hurt the Canal. The relationship between the railroads and the Erie Canal was complicated, highly contingent, complementary, and surprising. There is a lack of symmetry in how the Canal and the railroads are viewed. The Canal is described as corruptly managed, poorly constructed, and poorly maintained—in contrast of course to the railroads, those paragons of business and engineering virtue.

In short, the maintenance of a far-flung riparian infrastructure composed of several hundred miles of canal and dozens of small structures, has become a story of failure. Too many histories promote the value that the flip side of innovation is obsolescence.

The problem is that the politics, construction and success of the first Erie Canal make a great story, one that has all the components of our favorite stories—it has a quest (build an impossible canal) heroes (young Americans) older wise men (DeWitt Clinton) obstacles and setbacks (money, politics, natural forces and geography) a higher power (an invincible can-do American spirit of progress) and happy resolution. It is, in short, Star Wars. But after the victory celebration, the Rebel Alliance has got to get down to some serious governing. It is too easy to come up with images of invention and innovation—the photograph of the driving of the golden spike in the transcontinental railroad comes to mind. What we need to provide are images of maintaining.

My image is David Whitford. David Whitford worked as an engineer on the Erie Canal system from the 1850s into the twentieth century, and he kept a diary every day for most of the years, so we know something about what he did. He grew up on a farm near Saratoga Springs, and came to Syracuse in 1852, as a young man in his early twenties, to work in the Canal office apprenticing on the job. Sometimes he is out in the field, putting down stakes, taking measurements--of towpaths, bridge abutments, muck, and excavations—and sometimes in the office calculating the amounts and costs of materials needed. There is a rhythm to it—lots of fieldwork, followed by days in the office turning field notes and measurements into plans and estimates. Water, appropriately, is the theme of Whitford’s diaries and the annual reports of the State Engineer –engineers spend their time trying to keep the right water contained in the Canal, and the wrong water out of the canal. The work is constant, with projects lasting a long time. The engineers move around the area a lot. Whitford will leave home early on the train, take a steamboat up one of the finger lakes, travel by horse and buggy to a site on the Canal, walk back down the Canal checking the condition of towpath and locks on the way, and catch a ride home on a freight train.

Whitford’s movements remind me that the Erie Canal system was not just a technological artifact, but part of an envirotechnical system. The Canal created a new landscape, a new second nature, and was in complementary relationship with roads and railroads. This suggests to me that we might want to frame the issue of maintaining by using environmental history methodology and focusing on preservation of landscapes. Thinking of infrastructures in terms of technology opens the door to powerful cultural ideas about technology—determinism, “one best way”, innovation and obsolescence--that all work against maintaining. But people don’t believe that landscapes become obsolete; Americans get landscape preservation, they don’t see environments in terms of innovation.

My concern is large-scale physical infrastructures, and there are other kinds of maintaining for which this methodology would not necessarily work—software systems for example. Which reminds me that we should think about how to keep the concept of “maintaining” from becoming a simple opposite to “innovation.”

3/28/16