A Tale of Two Bridges

The railroad bridge across the St. Lawrence River at Quebec, when it was built in the early years of the twentieth century, was the longest cantilever bridge in the world (that is the type of bridge formed from a series of triangular steel girders, a big black framework above the roadbed). Remarkably, an early moving picture was being filmed of its construction, and as it was being filmed the bridge collapsed into the river, carrying to their deaths dozens of ironworkers. In the film it can be seen that the bridge was being built out from one pier or support, out across the river to reach the opposite pier. The builders started from one side and had gotten more than halfway across, when the bridge collapsed. The bridge was rebuilt, lessons were learned, and it still carries the railroad across the St. Lawrence River.

The original bridge across the Niagara Gorge, built about 1846 where the Rainbow Bridge is today, was built by civil engineers John Roebling and Charles Ellet with an entirely different design. It is a suspension bridge, the archetypal bridge design with the sweeping curve of cable above the roadbed, the cable hung from two high supporting towers, the roadbed hung from the cable. The Niagara bridge, built to carry the railroad between Canada and the US, was one of the first major suspension bridges, and the challenge of construction at that site made it a model with world-wide impact.

The biggest challenge was to get the cable, which would carry all the weight, across the gorge. In building a suspension bridge, that's the first step in linking the two sides. To build the Brooklyn Bridge, for instance, the first thing Roebling had to do after the two support towers were under way, was to get the cable across the East River. For the Brooklyn Bridge, that was easy: carry it on the ferry. But for the Niagara bridge, given the steep cliffs and the huge volume of swirling waters, a boat could not cross. It was this difficulty which led many engineers to doubt whether any bridge could be built there.

Ellet solved the problem in this way: he held a kite-flying contest. The winner, a boy from Niagara Falls, Ontario, won the opportunity to fly a kite across the gorge on a long, silk thread. Given a strong west wind, that part was easy. The real skill came, then, in getting the kite to come down into the arms of Ellet and his colleagues waiting in Niagara Falls, New York. The work crew in New York then tied strong twine to the thread and gave a signal. The work crew in Ontario pulled the doubled line back across the gorge. The Ontario crew then tied a single strand of steel wire to the twine, signaled, and saw the wire pulled back across to New York. The process was repeated thousands of times until the silk thread had become a steel cable strong enough to carry the roadbed and two railroads across the Niagara Gorge.

We support people who have been segregated and isolated. We see that there is a gulf separating the people who live in service systems from other people in their communities. A major part of our work must be building bridges across that chasm. Our work, in other words, is **civil engineering**. In that mission we need to remember that it may be ineffective, perhaps even foolish, to try to build a bridge out from only one side of the river. We will need to build foundations and supports on both sides, to recruit people on the other side who are willing to catch the kites we fly, and to know that, where the chasm is deep and the waters turbulent, we can only work toward trainloads of people by beginning with an individual thread of connection.

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