

The Brooklyn Bridge and a Marriage of Equals

By Paul Wilmshurst

Washington Roebling is remembered today as the builder of the remarkable Brooklyn Bridge, but he would never have completed the project without the support of his wife, Emily. Discover more about their intriguing love affair - the background to one of the greatest monuments of the Victorian century.

Marriage of equals

There is something very modern about the marriage between Washington and Emily Roebling. Theirs was the kind of relationship that is today unremarkable, but which was then rare and brave - a partnership, not just an arrangement.

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They enjoyed intellectual equality; their letters reveal emotional and sexual frankness; and they offered one another strong mutual support and respect. This gave them the strength to survive the extreme hardships that came to haunt them during the construction of the Brooklyn Bridge. Together, against great odds, they achieved much. However, the bridge probably cost them their hope of a future together.

When they were married in 1865, there was little indication their lives would be difficult in any way. Emily Warren came from a wealthy, long-established East Coast family. She was well educated, with a strong sense of her own destiny. Her older brother was a General in the Union Army, and Washington Roebling was his assistant.

Emily and Washington met at a wartime ball. Neither was looking for a partner, but the mutual attraction was instant. She wrote later: 'Ordinarily, people meet each other in society and become intimate over a period of months. We fell in love straight away. I captured his heart and he mine. Mutual love and confidence in each other has defined our relationship since then.'

As for Washington, he could not have realised that he was destined to step soon, without warning, into his father's shoes, having spent his early life in the shadow of the domineering but highly gifted engineer and all-purpose visionary.

The iron father

Washington's father, John Roebling, was - in the language of the day - a man of iron. He was born in Prussia, studied engineering and philosophy in Berlin under Hegel, and had moved to America to escape the stifling constraints and bureaucratic thinking that characterised the old stiff European cultures.

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He saw America as a place without limits, a place where he could live out his dreams and build new towns and structures. His first venture had been a utopian farming community. Then he pioneered the manufacture of wire cable, and finally he put the wire cable to good use by building highly stable and very beautiful suspension bridges in Pittsburgh, Cincinnati and over the rapids at Niagara.

The Brooklyn Bridge was to be John Roebling's crowning achievement, and his son Washington was to work with him on the project. John Roebling proposed a revolutionary design, with two 300ft towers that would dominate the New York skyline.

The towers were to have sunken foundations out in the East River, and would have to support two thick steel cables. These cables would be spun in place, strand by strand, across the river.

It was steel that made a bridge on this scale possible. It was still, however, a novel and untested material, and at the time it was still illegal to use it in public building projects in Britain. However, John Roebling was confident that its lightness and strength would make a mile-long bridge possible, for the first time.

His plan was approved, but just three days into construction, disaster struck. In July 1869 John Roebling was injured, before even one stone of the new bridge had been laid. He was surveying the site for the Brooklyn Tower when a ferry hit the Brooklyn waterfront pilings, and his foot was badly crushed.

His toes were amputated - without anaesthetic - and he was soon settled in Washington and Emily's house in Brooklyn Heights. He dismissed his doctor and took charge of his own case, insisting water be poured onto the wound night and day.

John Roebling's belief in hydrotherapy was powerful, but the unsterilised water did him more harm than good. Within two weeks he had contracted lockjaw, and he died in agony. Washington Roebling had cause to feel a little responsible:

'I feel that I perhaps made a mistake in not taking my father to a hospital at once. But my father had very decided beliefs, and looked upon hospitals as the abode of the devil - and upon doctors as criminals.'

Washington Roebling

Washington had witnessed some of the bloodiest battles of the Civil War, and had seen whole fields covered with corpses. However, he said later that his father's agonising death had been even more traumatic than the sights that had so distressed him in his time as a soldier.

'So within a month ... he was in charge of the project - the most prestigious of the continent and of the age.'

Up until his father's death, he had been working as an assistant. Now, he was the only man who could put the plans for the Brooklyn Bridge into action. At the age of 32, he was in charge of the project that was the most prestigious both of the American continent and of the Victorian age.

As work got under way, he designed special pneumatic 'caissons', which were used to sink foundations into the riverbed. In many ways, this was the most revolutionary part of the entire construction.

The caissons were enormous, airtight, wooden mining chambers, 160ft long and 100ft wide, filled with compressed air. Granite blocks for the towers were laid on top of them, to help push them down their mine shafts.

Inside the caisson, shift after shift of labourers dug away at the mud and boulders under the East River. They had to blast the heavier rocks, and as they worked the whole unwieldy structure moved down the shaft at a rate of inches per week.

Washington supervised the work in the caissons, and took charge whenever there were problems, even when it affected his own health. The Brooklyn caisson suffered many problems, with a fire in the wooden roof, a number of blow-outs, and floods and other accidents.

Whilst the Brooklyn caisson had a perilous descent, the New York caisson offered a more insidious danger. The increased depth - more than 75ft - and the heavier pressure - four atmospheres - meant that as the workers progressed down the shaft, they faced Caisson disease - sometimes known as the 'bends'.

Men were soon struck with wrenching pains, and paralysis, and a number of them died. Washington collapsed with his second attack in 1872 - just when the New York caisson had finished its journey.

For the rest of the construction, he remained an invalid, and it was his wife who managed his relationship with the bridge trustees and the assistant engineers. She interpreted his ideas, visited the site, and dealt with press, engineers and politicians.

Emily Roebling

Over the next 11 years, Emily Roebling was the public face of the Brooklyn Bridge, whilst Washington observed proceedings from the windows of their house in Brooklyn Heights. He watched as the towers rose, the cables were strung, the anchorages built, and the final stays and framework slowly came into position.

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If Washington had not married such a strong-minded and intelligent woman, he might have fallen prey to politicking and betrayal. Others might have tended him when he fell sick with 'the bends', but Emily Roebling not only ministered to him - she also took on the burden of responsibility for finishing the job of building the Brooklyn Bridge.

When the trustees tried to replace Washington as chief engineer, Emily organised his defence. She addressed meetings of engineers, and lobbied skilfully behind the scenes, as she fought for her husband's title and reputation. In the eyes of many, she became the chief engineer of the Brooklyn Bridge. It is not surprising that she was roundly praised at the opening ceremony.

The Roebling marriage, however, did not survive these events in very good shape. Emily had assumed her husband would retire from public life once the bridge was finished, and that he would spend time recovering quietly in the company of his wife and their son, John. But he did no such thing, for he and the company worked to supply wire cable for numerous other bridges - including the Manhattan bridge in 1909.

While Washington remained in Brooklyn, Emily moved to Troy, in upstate New York. She focused her attentions on John, whilst he went through his studies at the Rensselaer Polytechnic Institute - which was where Washington had studied. Emily Roebling also took a law degree, paying particular interest to the movement for the advancement of the rights of women. She died just after the turn of the century.

Despite his ill-health, Washington Roebling outlived his wife, and remarried. By the time he died, in 1926, the cause of Caisson disease had been properly established. It was caused by nitrogen bubbles forming in the blood, as the result of a too-rapid decompression on the journey up out of the caisson.

If the workers had spent a few hours per shift in the airlocks, instead of just 20 minutes, adjusting to normal air pressure in slower and more gradual steps, then none of the deaths or illnesses would have happened.

The Brooklyn Bridge

There is something very modern about the Brooklyn Bridge. It is a marriage of opposites held in tension: gothic masonry and sharp angular steel support stays; an open promenade deck and the boxed and girdered lower decks.

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At the opening ceremony it was called: '... this alluring roadway, resting on towers which rise like those of ancient cathedrals: this lacework of threads interweaving their separate delicate strengths into the complex solidity of the whole.'

When it was built it was unique - a bridge way ahead of its time. Using steel, iron, wood and granite, its designers were able to create one of the masterpieces of modern industrial design.

Building the bridge changed Washington and Emily. It was a great achievement but at terrible cost. Washington never recovered from his condition. As the years passed he was frustrated to watch people often forget the details, and give his father all the credit for the bridge.

Emily seems to have found - in managing the bridge and protecting her husband's interests - a role worthy of her intelligence and accomplishments. She was roundly praised at the opening ceremony. More than fifty years later she was honoured with a memorial plaque on the bridge itself.

SOURCE:

http://www.bbc.co.uk/history/programmes/programme_archive/seven_wonders_brooklyn_bridge_05.shtml