

TIMELINE
JOHN AUGUSTUS ROEBLING AND HIS "OHIO BRIDGE"
by Ashley Ford*

1806

Johann August Roebing is born on June 12 in Muhlhausen in Thuringia (Germany), where his father, Christoph Polycarpus Roebing, is in the tobacco business.

1815

Daniel Drake extols the desirability of a bridge across the Ohio River but suspects that it will be a very long time before one is built (in his "Picture of Cincinnati")

1823 (?) Johann Roebing's mother Frederike Dorothea Roebing scrapes and saves to pay for his attendance at the famous Royal Polytechnic Institute in Berlin where his studies include architecture, bridge construction and hydraulics; his teachers include the famous philosopher G.W.F. Hegel who imbues the young Roebing with independence of thought--along with a fair degree of arrogance--and also starts him thinking about moving to America as a place where a man might determine his own destiny.

1827 Roebing takes first job, managing road construction in Westphalia in Prussia; becomes interested in the iron chain suspension bridge over the Regnitz River in Bamberg and writes study/thesis on bridge building based on study of that bridge.

1829 Roebing quits his engineering job and opens a book shop and publishing business in Eschwege, Thuringia; meets and develops close relationship with Johann A. Etzler, Protestant minister and author/promoter of German emigration to America; joins Etzler in publishing book on the advantages of life in America over Germany; becomes active in Muhlhausen Emigration Society and starts to think about emigrating himself.

1831 Roebing and his brother Karl Friedrich undertake to lead a party of 53 emigrants from Muhlhausen to Pennsylvania to found a farming community; they sail on the 230 ton American packet *August Edward* out of Bremen bound for Philadelphia with plenty of luggage, a not inconsiderable grubstake for the group of \$6,000 in cash and a trunk full of books on geography, physics, chemistry and English literature and poetry including a quotation from an essay by Samuel Johnson that "No man was ever great by imitation"; arriving in port after 11 weeks at sea (before the age of steam!) they head for Pittsburgh where the Roebing brothers buy 1,600 acres (McCullough says 7,000 but that seems unlikely at the price) of land in Butler County to the north for \$1.37 an acre to found a community they call Germania but soon change to Sachsenberg and then Saxonburg; the town prospers as the center of a farming community attracting additional German immigrants in the ensuing years. [This account is mostly taken from David McCullough; Donald Sayenga says that brothers Johann and Karl came over alone to select and buy the townsite, writing to attract others only after already laying out the town.]

1836 Roebing marries Johanna Herting, eldest daughter of Ernst Herting, a tailor from Muhlhausen who had come to Saxonburg in 1834; couple eventually has seven surviving children--four sons and three daughters.

1837 First-born child Washington Augustus is born to Johann and Johanna while brother Karl dies shortly thereafter; Roebing becomes a U.S. citizen, changing "Johann August" into John Augustus, but tires of farming and returns to the profession for which he was trained; signing on

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as surveyor and engineer for the State of Pennsylvania, he starts working on canal projects including feeders to the Pennsylvania Main Line Canal intended to compete with New York's Erie Canal along with dams and locks on the Sandy and Beaver Rivers. [Again, this is taken mostly from McCullough; Sayenga attributes Roebling's return to the engineering profession to economic failure of the town of Saxonburg as a result of the Panic and Depression touched off by the "Specie Act" enacted after the election of Andrew Jackson.]

1839 Roebling starts surveying for a railroad route through the mountains eastward of Pittsburgh--laying the groundwork for the eventual mighty Pennsylvania Railroad.

1839 Roebling turns his attention to the Allegheny Portage Railway between Johnstown and Holidaysburg, which hauled Pennsylvania Canal boats over the summit of the Alleghenies on ten inclined planes; proposes replacing hemp hawsers on the inclined planes with iron rope to solve periodic breakage problem; meanwhile a group of Lexington businessmen propose building a bridge across the Ohio at Cincinnati to feed a railroad to be built to the South through Lexington.

1841 Roebling starts manufacturing twisted wire iron rope at Saxonburg to use on the Allegheny Portage Railway and quickly develops market for product for dredging and mining equipment all over the country; farmers of Saxonburg become factory workers.

1842 American engineer Charles Ellet starts work on Fairmont Bridge over Schuylkill River at Philadelphia--first important suspension bridge in the U.S.

1844 Roebling gets first commission as an *engineer*, to build suspension aqueduct to carry Pennsylvania Canal across the Allegheny River; uses two seven inch "selvagee" cables (iron wires grouped longitudinally into strands) supporting 7 spans of 160 feet each, carrying 2,000 tons of water in total; develops new way of anchoring cables by attaching them to iron eyebars imbedded in masonry.

1845 Half of Pittsburgh burns to the ground including Smithfield Street Bridge over the Monongahela that Roebling then gets a chance to rebuild as a suspension bridge spanning 1500 feet in 8 spans; Covington, Kentucky civic leaders start pushing for a bridge to Cincinnati.

1846 Kentucky General Assembly grants charter to the Covington & Cincinnati Bridge Company for a bridge across the Ohio at Cincinnati; Roebling submits a plan for a span of 1,200 feet supported by a single central tower in the middle of the river with roadway 100 feet up at center suspended by cables made of 5,500 1/8" wires wrapped into a single cable in lieu of traditional iron chains to eliminate cracking from cold, plus diagonal stays for stability against wind (all being basic Roebling technique and his major contribution to bridge engineering); steamboat interests object.

1847 Ohio legislature denies necessary charter for Covington & Cincinnati Bridge Company while granting one for a Wheeling Bridge Company, which engages Charles Ellet to build a suspension bridge at Wheeling (still Virginia!); Roebling offers 12,000 word paper to Pittsburgh Board of Trade proposing building of a "Great Central Railroad" from Philadelphia to St. Louis.

1848 Roebling starts on four more suspension aqueducts, on the Delaware & Hudson Canal, thereby expanding his reputation; relocates his business to Trenton, New Jersey, eventually changing its name to "John A. Roebling's Sons Company"--which name continued in use for successive generations by request/deed of his will at death.

1849 Ohio General Assembly finally grants the Covington & Cincinnati Bridge Company a charter for a bridge at Cincinnati and the Company seeks \$350,000 in bond sales to build it; Charles Ellet proposes a 1,400 foot span at Cincinnati while starting to build a 1,010 foot span at Wheeling without use of diagonal stabilizing stays as promoted by Roebling (see 1854!).

1850 Ohio legislature adds rider to original Bridge Company charter providing that the approach to the new bridge on the Cincinnati side must be located between Walnut Street and Western Row (Central Avenue) and further that the bridge approach on the Ohio side could enter “no lands used for public travel upon Vine, Race, Elm & Plum Streets”--effectively blocking any design that would line the new bridge up with existing streets in Cincinnati and Covington and thereby protecting established businesses and properties on those streets that would be majorly impacted by having a bridge approach above their heads.

1853-54 Modest (\$80,000) suspension bridge over Licking River between Covington and Newport, Kentucky is built by interests supportive of a larger one across the Ohio, but unfortunately the new span soon collapses following passage of a herd of cows, raising questions about bridges in general (later repaired and kept in service for decades).

1854 Four months after collapse of Licking Bridge the roadway of Charles Ellet's bridge at Wheeling also collapses from oscillations caused by windstorm (later rebuilt), raising further doubts about suspension bridges in general.

1854-55 Roebling completes 825' single span double-decked railroad/carriage bridge over the Niagara River near the Falls (begun in 1851)--first truly modern suspension bridge in the world, complete with stays for stabilization; public interest/confidence in suspension bridges starts to be restored.

1856 Kentucky coal merchant Amos Shinkle joins Board of Covington & Cincinnati Bridge Company and works with Company president Richard Ransom to prod Kentucky General Assembly to authorize doubling of Company capital to \$700,000; Roebling returns to Cincinnati to sign a contract on August 18 for construction of bridge featuring two towers supporting a central span with approaches placed between Walnut and Vine Streets on the Ohio side and between Scott and Greenup Streets in Covington; work on bridge begins in earnest early September with building of coffer darns of oak to allow setting of foundations of layered timber and cement grout upon which the sandstone towers could be constructed above.

1857 Roebling begins work on Allegheny River suspension bridge (1031 feet in 4 spans) in Pittsburgh near site of his old Pennsylvania Canal aqueduct bridge of 1844; spring flood delays resumption of work on Cincinnati bridge until July but failure of Ohio Life Insurance Company on August 24 starts Panic of 1857 which stops construction again after completion of foundations.

1858 Work on Cincinnati bridge resumes in July after spring flood season but runs out of money with Cincinnati tower at 45 feet above foundation and Covington tower at 75 feet.

1859-60 Financing continues to elude Bridge Company and project remains moribund.

1861 On April 10 Bridge Company authorizes issuance of Preferred Stock to better raise a new, higher target of \$1,000,000 to finish bridge; eight days later CSA batteries fire on Ft. Sumter in Charleston Harbor and the Civil War begins; John Roebling's son Washington volunteers (at direction of his father!) for service in the Union Army, and further financing and hence work on the bridge is suspended.

1862 In August CSA General Kirby Smith heads north through Kentucky with some 6-8,000 Confederate troops, threatening to attack Cincinnati; Union Major General Lew Wallace declares martial law and dispatches over 60,000 Federals across the river to the hills of Kentucky on a pontoon bridge assembled from coal barges near the uncompleted bridge towers to fend off the threatened siege and thereby demonstrates the utility of finishing the permanent bridge; sale of bonds to finance bridge resumes.

1863 Work resumes on bridge in spring, interrupted briefly in July by the regional alarm caused by John Hunt Morgan's raid into Ohio.

1864 Roebling has to order wire for main cables of the new bridge from England because of shortage of iron in the U.S. during the war; Roebling's wife Johanna dies on November 22, leaving John Roebling even more personally isolated than before; death reinforces earlier interest in Swedenborgianism and spiritualism.

1865 Washington Roebling returns from war as Lieutenant Colonel to resume service as his father's principal assistant; war ends as Lee surrenders to Grant on April 9; Abraham Lincoln is assassinated on April 14; bridge towers are completed by early September; on September 10 two 2-½" wire cables are hauled across by boat and lifted up the towers to hang a narrow footbridge, allowing stringing of the main suspension cables to begin (on November 1).

1866 Cable stringing is completed on June 23 using work platform hung between two smaller cables to carry 5,180 individual 1/8" iron wires across for each main cable-- grouped into 7 separate strands of 740 wires each; some 300 vertical suspenders are then hung from the two cables to support iron floor cross beams to hold the roadway, which is then constructed of oak and pine planking; stabilizing stays are then added extending diagonally in both directions from each tower to prevent what happened to Licking and Wheeling bridges; bridge opens to pedestrian traffic on December 1, and some 166,000 people in two days pay 30¢ each to walk across and marvel at this marvel. (Tracks for horse-drawn trolley cars were added in early 1867.)

1867 The Covington & Cincinnati Suspension Bridge--the longest suspension bridge in the world at the time--officially opens to carriage and wagon traffic on New Year's Day with parade led by Roebling and Amos Shinkle, by then president of the Bridge Company; tolls are set at 3¢ for pedestrians. 2¢ for a hog, and 10¢ cents for a carriage or wagon with one horse (plus 5¢ for each additional horse); in April, the New York State legislature grants charter to a New York Bridge Company to build a suspension bridge between Brooklyn, New York and New York City and Roebling presents his plan to build it, drawing significantly on his experience in Cincinnati; in May, Roebling is designated Chief Engineer for the New York project; over the summer son Washington and his pregnant wife Emily represent his father in sentimental return to Muhlhausen--to which Roebling later sends a significant cash gift in gratitude; in November, Roebling's deceased wife Johanna Roebling starts returning to answer questions from John in seances in his home in Trenton. [Sayanga suggests that the Roebling who led the parade on New Year's Day was actually Washington Roebling, who took over finishing the Cincinnati Bridge as his father moved to New York.]

1869 In early April John Roebling brings representatives of the New York Bridge Company by private train car to Cincinnati see his "Ohio Bridge"; on July 22 in Brooklyn, New York, Roebling dies terribly of lockjaw (tetanus) after having the toes on his right foot crushed by a docking boat involved in fixing the location for the Brooklyn tower of the new bridge; son Col. Washington Roebling quickly succeeds his father as Chief Engineer of the New York project and proves to be a master engineer in his own right.

1883 “The Great Bridge,” i.e. the Brooklyn Bridge across the East River in New York, opens after 13 years of construction under the direction of Washington Roebling, eclipsing the bridge at Cincinnati with its center span of 1,595 feet (and - galvanized steel cables instead of iron) but cementing the reputation of John A. Roebling as America’s master bridge builder--even though son Washington did most of the work--and in the end most of the engineering as well, so the man who actually built the Brooklyn Bridge was the son rather than the father!

1890s Local bridge engineer Gustave Bouscaren adds reinforcing collars with friction clamps to counter weakening of cables at anchorages of bridge at Cincinnati due to moisture problems detected on inspection by Bridge Company officials.

1895-99 The Covington-Cincinnati Suspension Bridge is rebuilt by Wilhelm Hildenbrand--who had been one of Washington Roebling’s Assistant Engineers on the Brooklyn Bridge-- with second set of cables, new trusses and wider roadway to accommodate the weight of the new-fangled electric streetcars while electric streetlights are added to illuminate the roadway (what won’t they think of next?); original decorative turrets housing saddles to carry cables over towers are replaced with prosaic silver dome structures.

1937 Bridge serves as only crossing of Ohio between Steubenville and Cairo during the Great Flood of 1937.

1953 The Covington & Cincinnati Bridge Company sells bridge to State of Kentucky for \$4.2 million and goes out of business; State promptly replaces wooden floor of with metal grating that famously hums, delighting some and driving others to distraction.

1963 Toll booths are removed upon opening of the toll-free I-75 Brent Spence Bridge.

1968 Bridge is declared “functionally obsolete” by Kentucky Department of Highways, prompting the public to rally around preservation of this historic structure.

1975 Bridge is placed on National Register of Historic Places.

1976 Bridge roadway truss structure is repainted blue (from earlier green) to celebrate the Nation’s Bicentennial.

1982 Bridge is recognized as a National Historic Civil Engineering Landmark.

1983 Kentucky Secretary of Transportation officially names bridge after John A. Roebling, recognizing the importance of the structure in bridge history and of Roebling as a bridge engineer (coincident with 100th anniversary of the Brooklyn Bridge!).

1984 Bridge towers and cables are illuminated with sodium vapor lights as contribution by the Covington & Cincinnati Bridge Committee, Inc. a support group dedicated to protecting and enhancing the historic structure.

1987 Kentucky Transportation Cabinet begins major restoration of bridge at cost of more than \$10 million, including replacement of 1866 suspender cables and replacement of the 1899 domed saddle caps with turrets resembling the originals.

1988 The John A. Roebling Suspension Bridge goes to Hollywood, or rather Hollywood comes to the bridge by featuring it in “Rainman” with Dustin Hoffman--and in the process making the thing seem longer than its cousin in New York!

1992 Decorative orbs and toppings are replicated from original plans and returned to tops of 1987 reproduction turrets, bringing the restored bridge closer to its look when completed in 1867.

Engineering statistics: Overall length of roadway = 2,252 feet (cf. Brooklyn = 5,989')
 Length of roadway between shore anchors = 1,619 feet
 Length of roadway between towers (main span) = 1,057 feet (cf. 1,595')
 Height of towers = 230 feet above foundations (cf. 276' in Brooklyn)
 Height of roadway above foundations at towers = 90 feet (cf. 119')
 Amount of masonry in each tower: 400,000 cubic feet (cf. 1,031,776 in Brooklyn tower & 1,267,515 in New York tower)
 Each cable = 5,180 separate 9-gauge (approx. 1/8") iron wires laid straight (selvagee style) serially compacted into 7 separate strands of 740 wires each and all further compacted into the final cable by wrapping them in a single layer of 10-gauge wire (cf. 5,434 = 19 strands @286 in Brooklyn)
 Diameter of resulting cables = 12-1/3" (cf. 15-3/4" in Brooklyn)
 Weight of each main cable = 1,050,183 pounds (cf. 1,732,086 in Brklyn)
 Number of suspender cables = 303 (at five foot intervals) (cf. 380)
 Number of diagonal stay cables = 76 (cf. ?? in Brooklyn)
 Iron floor beams (hung from suspenders) = 39 feet long
 Width of original roadway = 34 feet (20' + two 7' walkways) (cf. 85')
 Weight of original oak and pine planking for roadway = 600,000 pounds
 Total cost of original construction = \$1,800,000 (cf. maybe \$15,211,000)
 Deaths of workers during construction: 2 (cf. probably 20 in Brooklyn)

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