

*The St. Lawrence County Historical Association*

# *QUARTERLY*

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*Volume XLIII - Number 4 - Fall 1998*

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# The St. Lawrence County Historical Association at the Silas Wright House

The St. Lawrence County Historical Association is a private, not-for-profit, membership organization based at the Silas Wright House in Canton, New York. Founded in 1947, the Association is governed by a constitution, by-laws, and Board of Trustees. The Historical Association's membership meets annually to elect its officers and trustees.

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The St. Lawrence County Historical Association is a not-for-profit membership organization and museum which serves as an educational resource for the use and benefit of the citizens of St. Lawrence County and others interested in the County's history and traditions. The Association collects and preserves archival material and artifacts pertinent to the County's history. In cooperation and collaboration with other local organizations, the Association promotes an understanding of and appreciation for the County's rich history through publications, exhibits, and programs. The St. Lawrence County Historical Association operates within museum standards established by the American Association of Museums.

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# Quarterly

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**Cover Illustration:**

*Fireworks display at the opening celebration of the  
Williamsburg Bridge in December of 1903.*

Courtesy of Library of Congress, Prints and Photographs Division,  
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# Buck's Bridges: Civil Engineering Roots in the Victorian Age

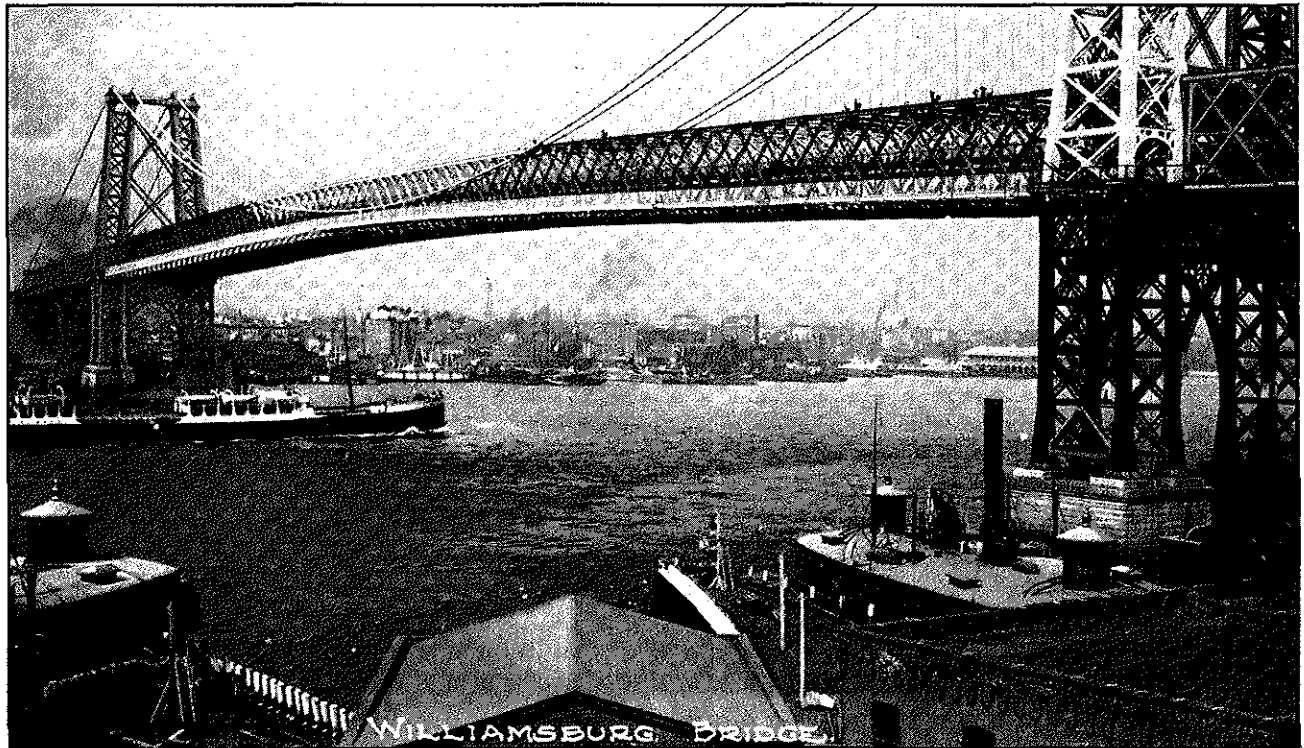
By Alan Teichman

The evening's guest of honor, Leffert Lefferts Buck, was not known as a talker. It is likely that even the many familiar faces scattered throughout the crowd of 240 people brought him little comfort. Praise of his own personal achievements was not something Leffert was inclined to promote. The gathering was the January 30, 1904 dinner meeting of the St. Lawrence Club of St. Lawrence University in New York. Leffert stood to answer the accolades before an audience comprising a "who's who" from his home town of Canton, New York. Joining them at the Aldine Hotel were New York City Public Works dignitar-

ies, politicians, and civil engineering peers. As chief engineer of the Williamsburg Bridge, Leffert had carried primary responsibility for this, the second East River bridge. As such, he would have understood better than most that no single man could design, plan, and construct such an ambitious work.<sup>1</sup>

To support his master bridge project, Leffert asked his nephew, Nelson Lemuel Robinson, to join him as private secretary. A native of Morley, New York and a member of the New York State Bar, Nelson, no doubt, provided legal advice as well. He later served New York

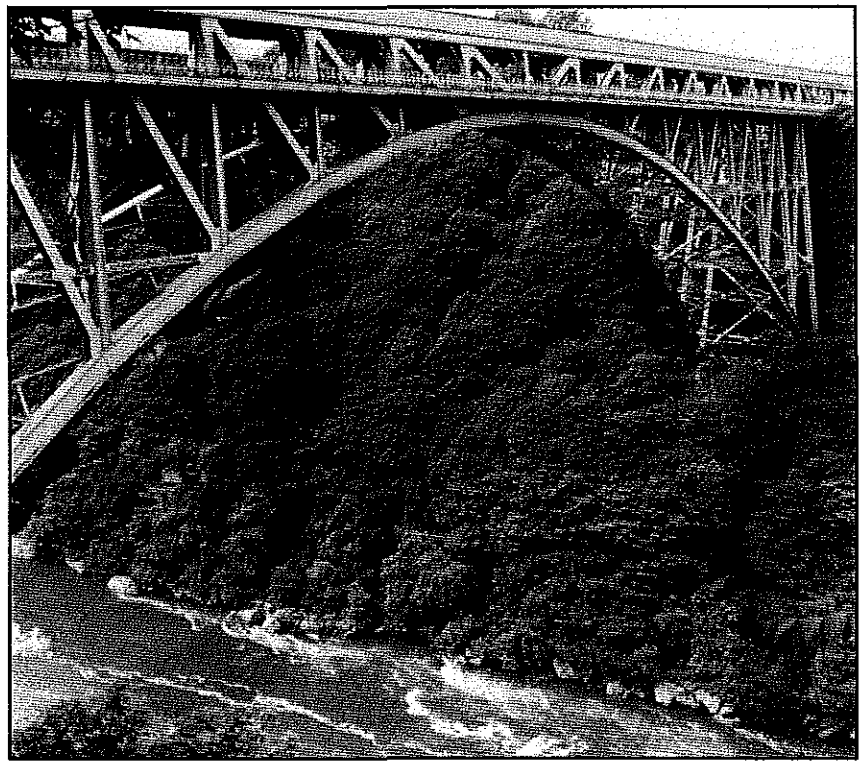
City as a deputy commissioner of bridges. Leffert's right hand man was reportedly Holton Duncan Robinson. Also a North Country native, Holton was from Massena Center. He was Nelson L. Robinson's cousin and a man who became expert at suspension cable construction under Leffert's mentoring. Paid high tribute by Leffert that night, Holton went on to construct other record size cables, then a long list of innovative bridges in partnership with David B. Steinman. Buck, Robinson, and Robinson, all St. Lawrence University graduates, formed a unique North Country team.<sup>2</sup>



*The Williamsburg Bridge in the process of being painted, (ca. 1910-1925).  
In the foreground are ferry slips on the Brooklyn side of the East River.*

“As to my work, I prefer to let the things I have accomplished speak for me,” Leffert asserted in response to the evening’s compliments.<sup>3</sup> Since its opening, the Williamsburg Bridge already spoke of interborough communication, economic development, and increased choice for the immigrants massed on the lower east side of Manhattan. Across the river in the quiet Williamsburg section of Brooklyn, it foretold a migration from the tenements of Manhattan into Brooklyn’s once quiet village. The silent movie, made at the bridge opening ceremonies on December 19, 1903, recorded jumpy images of a legion of top-hatted dignitaries. Lead by mounted police, a press corps, and Mayor Seth Low, they marched across the new bridge in celebration of its massive strength and record length.

The borough system in New York had recently been devised in response to the city’s exploding size and political complexity. This swelling metropolis needed massive bridge projects to insure and expand the commerce which was feeding its growth. Weather, a major adversary of the ferry system then serving the water-bound borough of Manhattan, made traffic movements especially unreliable during winter. Bridge traffic, unlike the ferries, was not affected by the ice which intermittently choked the rivers each time the temperature dipped. Unfortunately, bridges of the scope required to span the East River, located on such densely populated and highly valued land, were extremely difficult to plan and to build. Many disparate groups competed in a rush to either protect the status quo or promote their agenda for change.



*Whirlpool Rapids Toll Bridge (1997) in the Niagara Gorge. Designed and built by L.L. Buck in 1896, it replaced Roebling’s Niagara Railroad Suspension Bridge. Still in service today, it carries trains above and road vehicles below on two decks.*

Finding the money to finance such a project was also a major challenge, often taking years to organize. All of this added to the decidedly difficult technical challenge: to design and erect a structure capable of carrying the anticipated traffic load over the proposed distance of span, at reasonable cost. New York City was neither an easy nor forgiving place to lead such a project. Washington Roebling had confronted political dispute, corruption, financial shortfall, and schedule overrun during his twelve year struggle to complete the first East River bridge, the Brooklyn, just downstream from the Williamsburg. Only through such strong efforts was it possible to establish New York City’s extensive bridge infrastructure.<sup>4</sup>

Buck’s Williamsburg Bridge would never become the icon John A. Roebling’s Brooklyn Bridge had become even before its completion.\* The Williamsburg reflects Leffert’s practical, sturdy, and unassuming character, serving more with monumental utility than with monumental style. For the largely Jewish im-

\*The Brooklyn Bridge was John Roebling’s master-work, which he had carefully built toward over many years. Each of his other remarkable suspension bridges developed and confirmed his theories on long, cable suspended spans. At the inception of construction, while surveying on the Brooklyn side of the East River, John Roebling’s foot was crushed when a ferry suddenly bumped into its slip. The injury led to the tetanus infection which claimed his life less than a month later, on July 22, 1869. Responsibility for the project then passed to his son, Washington. Though relatively young, Washington Roebling had worked closely with his father on other projects.



*1885 Birdseye View of Canton, New York.  
The Buck Family owned the property in the corner above the  
railroad tracks and left of Buck St. and the residence on the river  
side of Miner St. just south of the Pine St. junction.*

migrant population, it provided a way to literally walk out of squalor on New York's Lower East Side into the developing industrial quarter in Brooklyn's Williamsburg section. The first suspension bridge built entirely of steel, it illustrates Leffert's willingness to take advantage of emerging materials. It was concurrently hailed as the world's longest and strongest bridge, and condemned as a ponderous utilitarian giant. Some thought it unworthy of association with its graceful downstream neighbor, the Brooklyn Bridge, and the proud city it was intended to serve. As Levi Asher wrote recently, "The Williamsburg Bridge glides like a low-flying bat from Brooklyn near the Navy Yard to Delancey Street on the Lower East Side of Manhattan. This bridge once belonged to the factory workers of Brooklyn's industrial waterfront and the Irish and Italian and Jewish and Chinese immigrants of old New

York. Like these ancestors, it is unglamorous and appears lonely. Its beauty is harsh and sad." By now the swooping arc of its distinctive stiffening truss has been accepted as a reliable, if eccentric, feature on New York City's public works landscape. The Williamsburg Bridge, celebrated that evening at the St. Lawrence Club dinner, was saved from threatened replacement by a 1988 decision to reconstruct it. Leffert's masterwork will continue to serve New York City into the next century.

Like his forebears, Leffert embodied the pioneer traits of independence, courage, tenacity, ingenuity, and service to duty. These traits were manifest in his father, Lemuel Buck, his grandfather, Isaac Buck, and his great-grandfather, also named Isaac Buck. An emigrant from New Milford, Connecticut, Leffert's great-grandfather Isaac had been a member of Pittsford, Vermont's

first volunteer company in the Revolutionary War. A member of Benedict Arnold's unfortunate expedition against Quebec, he died there in the smallpox epidemic that swept the troops captured by the British. Leffert's grandfather Isaac served under Ethan Allen and participated in the capture of Fort Ticonderoga on May 10, 1775. In 1804, the grandfather moved his wife Sarah (Hall), with his son Lemuel and the rest of their children, from their existing life in Addison, Vermont into the frontier forest of northern New York State.<sup>5</sup>

At that time there was neither settler nor bridge in the wooded corner of the Town of Potsdam which encompassed the Grass River upstream from what is now Madrid. The community that sprang up soon after took its name from Isaac Buck's bridge, built of wood in the primordial landscape soon after 1806. It was a modest and tenuous affair compared to Leffert's Williamsburg Bridge. Plentiful timbers from Isaac's adjacent sawmill would have made repair or replacement relatively easy. Bridge replacement was in that time frequently necessitated by the ice laden floods of spring. The upheaval which Leffert's father, Lemuel, had experienced during his move into the wilderness from Vermont was rewarded by a rich adolescence in that pioneer settlement composed of farms, workshops, and his father's sawmill and store. After marrying Elizabeth Baldrige in 1822, Lemuel farmed for a time nearby in the Town of Madrid while starting a new generation of Bucks. The couple had produced four or five offspring by the time political success led to their move into Canton village upon

Lemuel's election to the office of County Sheriff, in 1832.<sup>6</sup>

Leffert Lefferts Buck, their seventh child, was born in Canton on February 5, 1837.\* Lemuel was by then a member of the local political elite, serving the first of four years as Canton Town Supervisor. He was an intimate friend of Senator Silas Wright, who he may have met back in Buck's Bridge. Silas Wright, who was soon to become Governor, reportedly often came there to visit his cousin Warren Wright, another of the early settlers at Buck's Bridge.

Leffert grew up with a varied experience which included both farm and village. His father, Lemuel, was involved in politics and the lumber business for years, yet reported his occupation as "farmer" for the 1850 census. Farming was the prevalent occupation of the time, when most heads of household pro-

vided directly from the land, or through a combination of direct and indirect means, by barter with neighbors. Pivotal to the transition from a produce-barter economy toward a mercantile-cash economy was arrival in Canton of the railroad "cars", around 1856.<sup>7</sup>

Leffert was born into the twilight of the "age of homespun," when sheep outnumbered cows in St. Lawrence County, their wool being converted to cloth in the home. He experienced firsthand the dawning of the "age of mechanization", as equipment powered by water was applied in each of the industries springing up along the rivers scattered across the North Country. Sawmills like his father's and grandfather's were among the first machine driven enterprises, working logs into boards, expediting the conversion of woodland into village and farm. The railroad tracks adjacent to his

family's Buck Street property gave a daily demonstration of the power of steam. This was a pioneer period for political organization, requiring the creation of a public works infrastructure in the towns of St. Lawrence County. As a politician, Leffert's father had to deal regularly with issues of rights of way and tax assessment to finance public roads and bridges. Buck Street in Canton was named for Lemuel, reminding us of his contribution to civil life during those settlement days in the North Country. He provided his son, Leffert with a strong model for public service and a rich palette from which to craft a life's work: agriculture, industry, business, and politics.<sup>8</sup>

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\*No explanation or source for the curious name Leffert Lefferts Buck has been found by the author.



*1885 Birdseye View of Canton.  
Leffert Buck apprenticed and worked as a machinist in the mills along the Grass River.*

From an early age, Leffert found inspiration in the machine age. He reportedly experimented with civil engineering as a child. He built water wheels to harness the brook running into the Grass River near his home where today's Kraft Cheese Plant adjoins the railroad tracks on Buck Street. He reportedly also built bridges across other brooks in town. Leffert faced an emotional watershed when his mother died in 1849. He was twelve and she was forty-seven. This untimely event denied Leffert his mother's nurturing influence during the transition into maturity. In her absence, his family and church likely provided moral and spiritual compass. The Bucks were members of the Canton Universalist Society, of which his father was a founding trustee. His oldest sister, Adelaide Olive, was in her early twenties, and the twins, Cordelia Victoria and Cornelia Angelica, were just twenty years old. No doubt they helped guide him with influence and care during this time of adolescent loss.<sup>9</sup>

Little is recorded about Leffert's other siblings. Sister Harriet was fourteen when their mother died. His two younger sisters were Elizabeth, ten, and Eugenia, six. His oldest brother, Edwin, was in his middle twenties, and brother De Azro was in his middle teens. Leffert remained close to Cordelia, returning to Canton to visit her and her husband George K. Robinson. It was through this relationship that Leffert got to know both the Robinson's son, Nelson L. Robinson and their nephew, Holton D. Robinson, the men who would later help him on the Williamsburg Bridge project.\*

For a boy of Leffert's interests, the Village of Canton must

have been an exciting place in which to grow up. From his home upstream on the Grass River he could walk down Miner Street into the jumble of industry found in the shops and mills around the river pond between Falls Island and Water Street (now Riverside Drive). Possessing a determination to do things regardless of difficulty, it was said of Leffert that if an older boy could do something at sixteen years, Leffert would be determined to do it at fourteen years, and did. After completing the curriculum at the Canton Academy, which his father had joined in founding, there was no nearby place at which to continue his academic education. He completed instead a machinist's apprenticeship lasting three years with Alvah Sawyer, then practiced as journeyman for another one and one-half years. It was during this period that Leffert reportedly conceived of becoming a civil engineer.<sup>10</sup>

At about the same time, the Universalist Church had begun to actively seek the establishment of a theological school somewhere in New York State. A group of Canton businessmen were successful in attracting the proposed theological school, which would become St. Lawrence University. Both the Universalist Church and Canton townspeople would benefit from the arrangement. The Universalists were provided a three-story brick building and a campus of twenty acres, which also could be worked as a farm. The people of Canton attached provision for a College of Letters and Science which would provide a non-sectarian complement to the theological school. Lest their children climb too high into that academic ivory tower, however, a

portion of the Canton supporter's moneys were pledged on condition "that manual labor for two hours each working day should form a part of its curriculum."<sup>11</sup>

The Theological School began its academic program in 1858. The following year, at age twenty-two, Leffert joined the inaugural class of the School of Letters and Science. He studied under John White Clapp, A.M., the professional civil engineer and honorary graduate of Amherst College who had been placed in charge of mathematics and natural science. For the next two years Leffert pursued the fledgling university's secondary studies program, which sought to engender a love of classical literature and to "cherish and intensify" the scientific spirit.<sup>12</sup>

In 1861 Leffert's college education was threatened by the political crisis which finally erupted into war. By April, nervous South Carolinians could find no alternative but to attack Federal forces at Fort Sumter. What blossomed during that summer of patriotic fervor was a tangle of weeds, a garden which neither

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\*Holton moved from his home in Massena in 1879, at age sixteen, to live with his Uncle George, and attend the Canton Academy. Stored in the attic of his uncle's house, Holton found bridge plans on rolled linen oilpaper drawn by Leffert L. Buck whom he later met there. (Manley, 1939) Upon Holton's graduation from St. Lawrence University in 1886, Leffert offered him a position as rodman on a construction crew, thereby initiating his career. Holton's career effectively extended Leffert's professional influence well into the first half of the twentieth century. Holton Robinson's partnership with David B. Steinman after 1920 created a formidable team. A particularly complementary pair, they completed many important projects prior to Holton's death in 1945. The Steinman firm continues its leading bridge design and consulting activity today.



side really cared to tend. Before the disagreement could be settled, four long years and countless agony was expended by both sides. Leffert's father reportedly offered Leffert the benefit of an officer's commission, made possible through Lemuel's political connections. But Leffert, lacking confidence in his abilities due to lack of military training, chose to enlist as a private instead. He apparently preferred to learn from experience and to earn any advancement rather than to simply accept the more comfortable and perhaps safer commission.<sup>13</sup>

The strange disturbance which arose in Canton on the ninth day of September, 1861, came from a gathering of unprecedented make-up and purpose. Walking shoulder to shoulder that day was a crowd of 105 men ranging from eighteen to forty-five years of age. It is likely that many of them held a prevalent northern view that the Bill of Rights proclaimed so called "natural law", describing the natural rights of all humans. This was the attitude that was encouraging the growing abolitionist movement. Others in the group were probably responding to President Lincoln's April call for the patriotic defense of the Union. For whatever reasons, the twenty-four year old Leffert had decided to interrupt his studies, duty bound to do "the right thing." Leaving for the first time the protection of his father's roof, Leffert walked out of one life into another that day, not fully understanding the risk. The volunteers carried with them a United States flag that had been presented by the citizens of Canton. Professor Massena of the Theological School was spokesman for the citizens of the village at a public



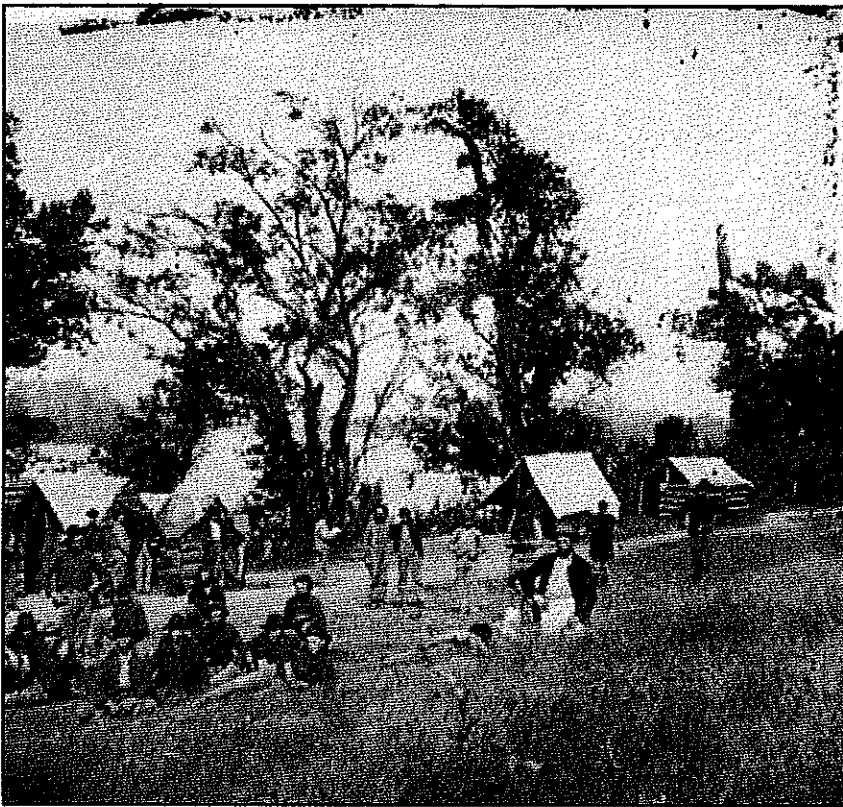
*Leffert Lefferts Buck*

farewell ceremony. Colonel William B. Goodrich, a Canton lawyer, recruiting officer, and co-founder of the St. Lawrence Plain Dealer newspaper, accepted on behalf of the men. As Leffert's memory of the farewell ceremony was dulled by time and distance, that presentation flag would undoubtedly remain a reminder of the distant universe of home and youth.<sup>14</sup>

Arriving in Ogdensburg, the men took up residence at Camp Wheeler, hurriedly set up at the old railroad shops there. They then began the process of transformation from friend and neighbor into tent- and team-mate, building the military skills and trust which would provide some

hope for survival. Their excursion would become a vicious experiment, straining the existing tactics and medical knowledge with new weapons technology and unsanitary living conditions. It would change these men's world in ways beyond experience and impossible to imagine in that crisp September air. Caught up in a relentless process, they faced a hardening which would persist for almost four years. Each survivor would be transformed in a particular way by the hardship of years marching and camping in the open, with the boredom of camp life periodically punctuated by fear, chaos, then carnage.

The first to organize at Ogdensburg, Leffert and his



*View of Federal troops camped by the Tennessee River near Chattanooga and Lookout Mountain*

group from Canton were mustered under William Goodrich as the "A" Company of the 60<sup>th</sup> Regiment, New York Volunteer Infantry. Receiving training in basic drill at Camp Wheeler, they learned to carry and care for their Enfield rifles. On the first of November, 1861, 4<sup>th</sup> Corporal Buck moved south by train and steamer with the 997 others who were bound to walk the roads, fields and woods of northern Virginia, Maryland, southern Pennsylvania, Tennessee, Georgia, and South and North Carolina. They ultimately covered thousands of miles on foot, struggling through mud, sleeping in rain, enduring snow and winter cold, with short rations and sickness as routine companions.

Company A's first assignment required forbearance. The boredom of railroad guard duty on the

line between Washington, D.C. and Baltimore lasted through winter and spring. The following summer they faced their initial and most deadly enemy, typhoid fever, which caused an intermittent plague of 767 cases over time. While shadowboxing rebel units in northern Virginia and around Harper's Ferry, theirs became a sad, diseased existence. With no understanding of how the typhoid was caused or spread, there was no chance to control its infections. Regular washing of hands was not a practical possibility for soldiers, and they had no recognition of the asymptomatic carriers in their midst. Believing the outbreaks to be the result of "acclimation," they missed entirely the significance of unsanitary food handling and accidental mingling of waste and supply water each time they encamped. Although Lef-

fert, too, fell ill with "the fever," his constitution proved strong enough to avoid early burial in one of the makeshift cemeteries along the zigzag line of march. According to one account he lay in hospital weakened by typhoid and barely able to walk, his uniform having been placed out of reach. Hearing of an impending military engagement, but lacking release by the surgeon, he showed up with his command in hospital clothing, sword in hand.<sup>15</sup>

The first significant military threat came in September of 1862 at Antietam, Maryland. As they entered into action, the third Brigade was caught at the rear of the Union forces routed from the west woods by fresh rebel units. In a moment, Col. William B. Goodrich was shot from his horse and killed. Before he even had a chance to fire, Leffert was shot through both thighs. Disappointed but blessed, he stayed with his unit until a night on the cold ground stiffened his legs beyond walking, forcing him to hospital. The survivors experienced a long hideous night among the dark groans of lingering wounded. Antietam demonstrated the ignorance, on both sides, of the crucial value of position and protective works as defense against massed rifle fire. Cartridge loaded rifles fired much more quickly, accurately, and reliably than the muskets of the preceding era.<sup>16</sup>

The next spring at Chancellorsville the enlisted men proved to themselves that they could perform as required in a prolonged fire-fight. The feeling among them grew that, if allowed by more decisive leadership to stand their ground, they could beat the Confederates. It

is likely that Leffert's confidence grew along with his comrades', as experience taught them practical techniques for improvement of their chances under fire. Turning north from Chancellorsville, in a hurry to challenge Lee's invasion of Pennsylvania, their spirits were strong. More comfortable after re-supply with shoes and clothing, their emotions were boosted again on crossing back over the Mason-Dixon Line. Leffert and his partners would have heard the artillery fire as they approached Gettysburg late on the afternoon of July 1. They nervously waited, weapons at hand, through the long night. Beginning just after daybreak on July 2, the men took up battle position on a wooded hillside. Working with a will, the men completed protective works by around 9:00 a.m. under brigade Commander George Sears Greene's direction. Their effort produced a well-conceived line of defense, snaking down the southeastern side of Culp's Hill, a testament to Greene's ability. The long tense day of waiting that followed ended abruptly in late afternoon as four of their cannon barked a warning to advancing rebels. Around 7:00 p.m. a massed attack by Johnson's division fell upon them, the sharp fighting continuing at close range until long after dark and erupting again the following morning. Leffert's "St. Lawrence Regiment" held their ground, displaying a great coolness along with all of Greene's command. They succeeded in holding the Union right flank against heavy attack during those two pivotal days in 1863.<sup>17</sup>

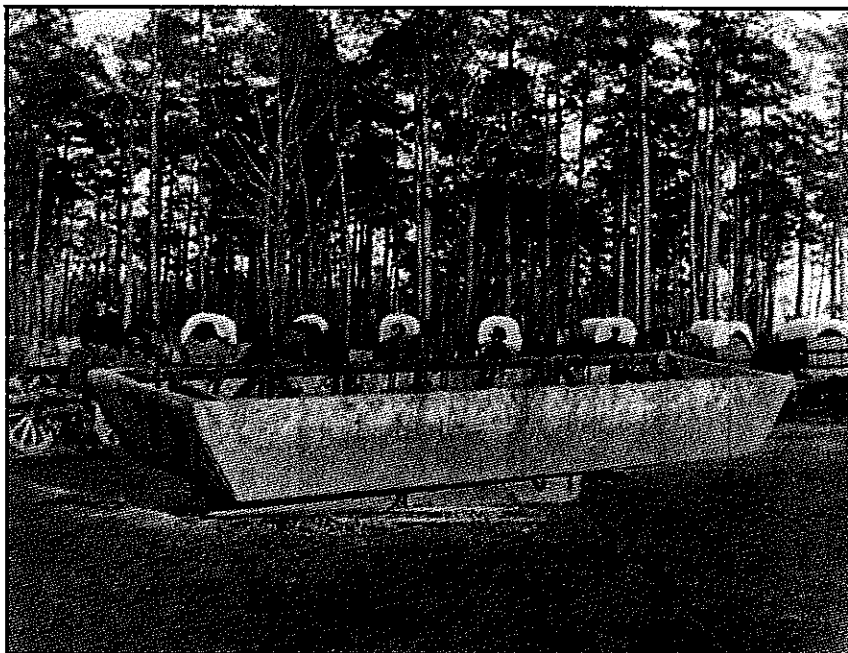
By October Leffert's Corps was transferred to Tennessee in aid of the Union Army at Chattanooga which was by that time

stalled and critically short of supplies. Col. George S. Greene, to their dismay, was wounded badly in the mouth at Wahautchie and forced from action for several months. Toward the end of November the Corps approached what was to be their climactic battle experience, dubbed by the newspapers as "The Battle above the Clouds." Lookout Mountain stood high above the Tennessee River, guarding the supply route on the south side of Chattanooga. Ordered as part of John Geary's division to take the mountain, Leffert and his fellow soldiers were called on to undertake the action about which they had only dared to joke. Lookout Mountain was generally considered to be impregnable.

The morning-long scramble under fire up a rough, wooded slope, having to hurdle recently felled trees among the rocks and ledges on the west side of the mountain, was exhausting. Fac-

ing stubborn, defensive fire, Leffert found himself positioned at the center of the forces feeling their way through a dense fog toward the main rebel works near the Craven House. Sergeant Leahy, bearing the colors, was hit twice and grounded. Hearing the Adjutant's shout "The colors are down! Who will take them?" Leffert responded, lifting their flag to lead his regiment into the defensive works. This perhaps appeased the disappointment he had confided to Chaplain Richard Eddy after Antietam when he reportedly told Eddy, "It is too bad they should have hit me before I had a chance to fire once!" Leffert was rewarded for his meritorious conduct with brevet Major rank.<sup>18</sup>

After Lookout Mountain came Ringold, two days later, on the twenty-sixth of November. Then the men faced a test of another kind. Approaching the regiment's time for re-enlist-



*A bridge pontoon constructed by the 50th New York Engineers near Rappahannock Station, Virginia.  
Timothy H. O'Sullivan, photographer.*

ment, each veteran member had to evaluate again his ability and will to continue. The regimental re-formation included a thirty day furlough for the veterans. Following a frigid twelve day train journey, Leffert passed back through Ogdensburg to find himself among his family and friends in Canton for the first time in more than two years. The brisk January air must have heightened his anticipation. During the following weeks the warm glow of candle-light and stove-side companionship likely softened the sharp North Country winter. Returning with the Sixtieth to attempt completion of the terrible job which had now dragged on so long, 1st Sergeant Buck chose to reacknowledge his duty.

The spring of 1864 opened with a southward advance from Chattanooga across the rocky, wooded ridges toward Atlanta. At Resaca, Leffert was wounded again. At Kenesaw Mountain, the North Country regiment struck, then were hit hard in turn by Hood's brutal onslaught at Peachtree Creek. Now, under General Sherman's unequivocal

leadership, Leffert and the others may have begun to sense an inevitability of outcome. They had moved, against strong resistance, deep into Georgia and were approaching the northern outskirts of Atlanta in the service of a commander with a clear plan and strong resolve. It was after taking Atlanta, during the long march toward the sea through Georgia, then beyond into South and North Carolina that the men faced their greatest moral and spiritual trial.

Called on to wage and witness Sherman's scorched earth strategy of "total war," their attitude was apparently one of men simply seeking to put an end to the conflict they had neither asked for nor begun. Moving incessantly through Georgia and South Carolina, against every impediment of weather and terrain, Sherman's army maintained an historic pace. This was the final stage in Leffert's hardening. Contrary to their representation as a mob, General Sherman described his army as "sixty-five thousand men, in splendid physique, who had . . . completed a

march of nearly two thousand miles in a hostile country, in good drill, who realized they were being closely scrutinized by thousands of their fellow-countrymen and by foreigners, . . . an army in the proper sense, well organized, well commanded and disciplined." As such this army would remain the subject of both pride and controversy.<sup>19</sup>

After marching in the victorious "Grand Review" of May 24, 1865, at Washington, D.C., Captain Leffert L. Buck was mustered out with his regiment on July 17, 1865, and left to pick up the threads of his life dropped in Canton years before. Only the fallen had been spared a lifelong shadow of war memory. The living persisted, as soldiers must, searching out new lives in an alien world. By this time Leffert's childhood experiments, academic training, and military experience had crystallized into a passion for civil engineering.

Several catalysts could have deepened this passion. The many pontoon bridges which provided transient wartime river crossings may have inspired Leffert to dream of stronger, more permanent alternatives, dedicated to peaceful purpose. Perhaps the crossing of Washington Roebeling's hastily hung wire suspension bridge high over the Shenandoah River at Harper's Ferry quickened both his determination and his pulse. What direct influence his regimental and brigade commander George Sears Greene may have had on Leffert's career choice is not known. A former mathematics instructor at West Point and practicing civil engineer, Greene had returned to military service in 1862. He was diverted from his career by the secessionist threat,



*Buck and Robinson monument in Evergreen Cemetery, Canton, New York. Leffert's headstone is marked by a flag.*

as Leffert was from his education. Leffert's prewar studies under J. W. Clapp at St. Lawrence University had been his introduction to the civil engineering tools of math and science. Their relationship had also presented Leffert with the acquaintance of a practicing civil engineer. Leffert's home on what is now Buck Street in Canton, was linked by the Grass River to his grandfather Buck's bridge. Perhaps idle reflection on childhood memories of the Grass River and home were influences during the arduous war years.<sup>20</sup>

Leffert's mission at last turned from destruction to creation that summer of 1865. His energy focused on civilian service and his life became civil engineering. Entering the Rensselaer Polytechnic Institute that fall, he faced an intellectual challenge as severe as the Civil War had been physically and emotionally challenging. In those early days at R.P.I., according to David B. Steinman, "Only the ablest and the most ambitious could stand the pace and survive the ordeal."<sup>21</sup> Completing the civil engineering course in three years, Leffert graduated in 1868 and started out by working under his former commander, George S. Greene, as an assistant engineer on the Croton Aqueduct Project, supplying water to New York City. The following summer, Leffert's father, Lemuel Buck, died quietly in Canton. Leffert was then thirty-two years old, without parents, but well prepared to pursue his chosen career.

After three years with the Croton Project, the rookie engineer traveled to South America in pursuit of an opportunity to design, plan, and construct his first

bridge. It would cross a deep ravine high on the Lima and Oroya Railroad, which was then being built across the high Andes in Peru. Called the Verrugas Viaduct, at the time it was the world's highest bridge. Later, when this structure was destroyed by flood, Leffert persistently designed and built its replacement in 1890.

Returning to the States, Leffert supervised manufacture of materials for the Louisiana Bridge across the Mississippi and worked on railroad projects in the West. Two years after his election to the American Society of Civil Engineers in 1875, a pivotal opportunity presented itself. He was engaged to carry out the repair and reinforcement of the cable anchorages of John Roebling's famous Niagara Railroad Suspension Bridge. This was the world's only suspension bridge designed for heavy railroad traffic. Considered originally by many engineering professionals to be unbuildable, it had proven a great success. Leffert's renewal of the corroded cable anchorages led to replacement in stages of the wooden stiffening truss and the stone cable towers with new ones of steel. All of this he achieved without interruption of scheduled railroad traffic. Because it was a toll bridge, the feat made for twice satisfied owners. The professional papers Leffert wrote describing this work received awards from civil engineering societies. The project confirmed his engineering potential and transferred to him the know-how of John Augustus Roebling, creator of the Brooklyn Bridge. While Roebling's son Washington was the primary heir to his father's genius, the exhaustive reconstruction of the Niagara Railroad Suspension

Bridge made Leffert an intellectual heir.\*

Leffert's work in the Niagara Gorge spanned twenty-two years in all, involving several bridge sites. Just below the falls, the Niagara River had earlier been crossed by what was at the time the world's longest suspension bridge. This bridge was rebuilt by Leffert, then replaced by him in 1897 with the world's longest steel arch, the Falls View Bridge. In the nearby Genesee Gorge, in 1890 Leffert had built one of America's earliest spandrel braced metal arches, at Driving Park Avenue, in Rochester, New York. This bridge came to be viewed as the prototype for the steel arch with which Leffert replaced Roebling's Niagara Railroad Suspension Bridge in 1896. A dramatic increase in the weight of locomotives and freight loads in the last quarter of the century had finally made this necessary.

While Leffert's association with the Roeblings certainly was beneficial, his work bore the in-

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\*Washington and Leffert were contemporaries, both born in 1837. They were members of the last generation of Americans raised in the rather primitive, frontier environment of the eastern interior. Both were R.P.I. educated and Civil War survivors. Both were in the Battle at Gettysburg, where each helped to hold a Union flank. Washington was on the left at Little Round Top and Leffert on the right at Culp's Hill. They both learned suspension bridge design under John A. Roebling, the master wire suspension bridge pioneer. Each lost his father in 1869, Leffert as he began his engineering career and Washington at the outset of the Brooklyn Bridge project. This loss caused Washington to face completion of his father's vision without him. Leffert rebuilt in stages, then replaced John Roebling's famous Niagara Gorge railroad suspension bridge and also worked on the Brooklyn Bridge project. Leffert formed a partnership from 1883 to 1888 with the assistant engineer responsible for the Brooklyn anchorage and tower of the Brooklyn Bridge, George McNulty.

dependent stamp of originality, practical ingenuity, and resourcefulness. Leffert Lefferts Buck, the guest of honor at the St. Lawrence Club dinner that winter evening in 1904, had earned international recognition and respect. According to a memoir published by the American Society of Civil Engineers, "His personal character was striking, and compelled admiration." Gen. Newton M. Curtis, a North Country contemporary, wrote of Leffert, "It is safe to say that no man of Northern New York has accomplished more in applying science to human needs, or won greater distinction in promoting the welfare of the people among whom he has modestly labored..."<sup>22</sup>

As the dinner crowd dispersed, Leffert could begin to relax, probably chatting good-byes with those who would soon travel back to Canton. They shared more than just acquaintance, having mutually inherited the experiences and values of an upbringing in a less distracted time and place. Leffert Lefferts Buck was an example of the type of genius produced by that distant North Country universe. As the A.S.C.E. Memoir went on to say, "Few men have steered a more direct course in life, wavered less in their estimates of right and wrong, or made less effort to win friendship or applause; and yet few men have had a greater number of devoted and loyal friends, or received more spontaneous and generous applause."<sup>23</sup>

Leffert Lefferts Buck had lived the nomadic life of a civil engineer until late in life. In 1902 at the age of sixty-five, he married for the first time and settled down in Hastings-on-Hudson, New

York with his wife, Mira Rebecca Gould of Paducah, Kentucky. He died at his home on July 17, 1909. Leffert was interred with the Buck and Robinson families at Evergreen Cemetery in his hometown of Canton, New York, where his grave can still be found.

#### About the Author

Alan Teichman was raised in Waltham, Massachusetts and attended St. Lawrence University. After graduation in 1968 he worked for two years for the St. Lawrence County Department of Social Services. Again a resident of Canton from 1974 to 1981, he operated a custom woodworking business in the Village. Since then he has resided with his family in High Point, North Carolina, developing office furniture products for Davis Furniture Industries, Inc.

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\*Available: St. Lawrence University Archives, Owen D. Young Library, St. Lawrence University, Canton, New York.

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Photograph page 9. Alan Teichman, c1999.

#### Endnotes

<sup>1</sup> "St. Lawrence Dinner," 25.

<sup>2</sup> Leffert's B.S. degree from St. Lawrence University was awarded in 1885, "nunc pro tunc" 1863 (that is, "now for then"). He was also awarded an M.S. degree by S.L.U. in 1885. Nelson Lemuel Robinson was S.L.U. class of 1877. Holton Duncan Robinson received his B.S. from S.L.U. in 1886.

<sup>3</sup> "St. Lawrence Dinner."

<sup>4</sup> For implementation of the borough system, see Zeisloft, *New Metropolis*. For a general understanding of the politics of building infrastructure in New York City, see

Petrosky, *Engineer of Dreams*.

Cutter, *Genealogical and Family History*, 1107.

<sup>6</sup> *Evert's*, 239, 110; Finnegan, "Looking Through a Main St. Window."

<sup>7</sup> Cutter, *Genealogical and Family History*, 1107; Smithers, "Buck's Bridge," 10.

<sup>8</sup> Harder and Smallman, *Toponyms*, 29; Robinson, *Robinson House*, 13.

<sup>9</sup> Finnegan; Robinson, *Nelson Lemuel Robinson*, 13.

<sup>10</sup> Cutter, *Genealogical and Family History*, 1108.; "Leffert Lefferts Buck. '63," 91.

<sup>11</sup> Pink and Delmage, *Candle*, 27

<sup>12</sup> *Ibid*, 15, 19.

<sup>13</sup> "Memoirs," 493.

<sup>14</sup> *Amistad*; Eddy, *Sixtieth Regiment*, 6.

<sup>15</sup> "Memoirs," 494

<sup>16</sup> Eddy, *Sixtieth Regiment*, 307; "Memoirs," 494; Eddy, *Sixtieth Regiment*, 175

<sup>17</sup> Eddy, *Sixtieth Regiment*, 260.

<sup>18</sup> *Ibid*, 307; Phisterer, *New York*, 322.

<sup>19</sup> Angley, Cross, and Hill, *Sherman's March*, 109.

<sup>20</sup> Eddy, *Sixtieth Regiment*, 268. The author has found no reference to direct contact between Leffert Buck and George Sears Greene during the war. There is reason to believe their paths would have crossed, and that they certainly would have known each other after the war.

<sup>21</sup> McCullough, *Great Bridge*, 154.

<sup>22</sup> "Memoirs," 496; Curtis, *From Bull Run*, 191.

<sup>23</sup> A list of guests from Canton can be found in "St. Lawrence Dinner."

### Rensselaer Polytechnic Institute Alumni Hall of Fame

Canton native Leffert Lefferts Buck has been accepted for induction into the Rensselaer Polytechnic Institute Alumni Hall of Fame. The Alumni Hall of Fame was established in 1997 as a way to give permanent recognition to R.P.I. graduates who represent "the best of the best"

The successful candidate must have made discernable contributions to humanity as a whole, a specific field of endeavor as a whole, or a unique niche area. The individual must be known nationally and internationally, should have benefitted society, made an impact on the world with contributions beyond his or her professional achievements, and provided a distinguishable and unique role model.

The inaugural class of inductees was announced in the spring of 1997 and formally inducted as part of Rensselaer's 175th anniversary celebration in the fall of 1998. This year's class will be inducted during the Alumni Weekend on Oct. 15-16, 1999.

Information about the inaugural class is available on the internet at: <http://www.rpi.edu/dept/NewsComm/Magazine/June97/fame.html>

# Massena Center Suspension Bridge was Built by Holton D. Robinson Who Later Became Famous World Wide

Written and Researched by  
Atwood Manley

Some interesting history was made in Massena back in the good old horse-and-buggy days of 1909-1910. For one thing, Walter F. Willson who had just become the County's first Superintendent of Highways, had the first stretch of hard-surfaced county highway built from Louisville (his home) to Massena village—nine miles in all. Some of Walter's cronies thought he had gone a bit off his rocker for he had just been bitten by the new auto-bug. He'd ordered a brand new copper-jacketed, four cylinder Cadillac

demi-touring car. As the story goes when he first drove this into his barn he went instinctive, pulled back on the steering wheel and lustily hollered, "Whoa, damn you, whoa."

The other historic departure from the normal came late in 1909 when Barney O'Neil, supervisor, and the Town Board took the bit in their teeth and decided to have a bridge built across the Grasse River at Massena Center. They were under considerable local political pressure no doubt. Something

had to be done down there. The board figured it would be possible to vote and float a \$40,000 bond issue for the job—but no more.

Barney O'Neil was a sound, hard-headed, better-than average lawyer and supervisor. He was sure he knew just the man to draw up the plans and specifications for this bridge. That man was Holton D. Robinson of New York City, a native Massena son, already noted as a bridge engineer.



Courtesy of Massena Museum

*Massena Center Bridge.  
An early photograph.*



But neither the Town Board nor Holton Robinson could foresee what lay ahead. When the bids were opened the lowest offer was for \$60,000, utterly preposterous to Barney O'Neil. When Holton Robinson was advised, his response was typical. He was positive that the bridge he had designed could be built within \$40,000—so, if no contractor was available at that price, why, he would come to Massena and personally construct that bridge, and become the contractor.

As of July 6, 1910, the contract was signed between the Town of Massena and Holton D. Robinson with the stipulation that said bridge be completed by December 31, 1910, a matter of six months; also that construction begin immediately. The contractual price was \$39,990.00, no more, no less. Holton Robinson, of course, full-filled his contract. For him this had become a matter of personal pride and personal honor. Also, he had great affection for the town of his birth.

One paragraph of that forty-three page document is of at least passing interest. It stipulated that in case any dispute arose between the contracting parties a Board of Arbitration settle that matter; that the Board consist of three men, one appointed by the Town Board, one by the Contractor; the third by these two appointees. In case these two could not agree on the third member that he be appointed by whom? By Walter F. Willson! That is how Massena folks rated Walter Willson: a Democrat in a rock-ribbed Republican community as of then.

The type of bridge proposed, planned and produced was

unusual at that time and has remained so to the present. All one need do is to drive to The Center and cross this bridge. Then one will understand.

To provide a thoroughly sound, substantial bridge but within the cost-figure of \$40,000, Holton Robinson designed a steel suspension bridge of only one lane width. One-lane suspension bridges are uncommonly rare. In fact it is doubtful if there is another one quite like this one any where in the world. The skilled engineer has recently referred to this particular bridge as "a miniature." Its roadbed is a tight twelve feet in width, insufficient to permit two standard-sized autos to pass with safety if at all, not too ample even for two mini-compacts to pass.

What Holton Robinson built, he built well. This bridge has long since outlasted that nine miles of hard surface road built by Walter Willson. It is today just as sturdy, just as sound as the year it was erected—although it does sorely need a good scrubbing, sanding and some paint. Structurally, it hasn't budged a fraction of an inch. The only change has been to lay a macadamized roadbed where originally there was a three-inch pine planking, laid one-quarter inches apart, "with the heart side down."

The uniqueness of the bridge at The Center is three-fold: First, because it is so narrow; Second, because of its smallness. It only has a 400 foot main span, with 100 foot side spans; Third, to the engineer technician, the cables are an outstanding feature.

Holton D. Robinson probably became the world's most expert specialist in bridge cable construction. His partner, Dr. David Steinman, once wrote that there probably was not a major suspension bridge constructed anywhere in the world but what, sooner or later, Holton Robinson was consulted. Therefore, and most important of all, the cables of this particular bridge, become of prime interest. Therefore, this article will focus attention upon them.

The bridge was erected in 1909. It is of the suspension-cable type. From each bank of the Grasse River anchorages its two major cables sweep up and over the two 60 ft. towers and then down across the river channel. From "saddles" or steel nodules, small, single cables, or "suspenders", hang down to carry the entire superstructure of the bridge, that is its girders and trusses carrying the entire roadway. One can, therefore, consider the cables being the very core of the entire structure.

Since 1909, and in fact, since 1935, three large steel suspension bridges have been constructed over the International Boundary section of the St. Lawrence River. We all know them: The one spanning the main channel to Cornwall; the Ogdensburg bridge; and the first of the three to be constructed, the Thousand Island Bridge. This latter is also a Robinson bridge, that is specifically a Robinson & Steinman bridge.

Drive to The Center, and then over to the bigger bridge leading to Cornwall. One glance at the major cables of each will indicate the difference in the construction of this particular part of those

two bridges. The large Cornwall span has cables eleven inches in diameter. Each of those cables has a found, smooth surface, like a mighty steel tube. With the little bridge at The Center the cables are only five and one half inches in diameter. They are not encased in a smooth covering. In fact, with the naked eye one can see just what cable construction is like; how the major cables each consist of a number of lesser individual cables which are

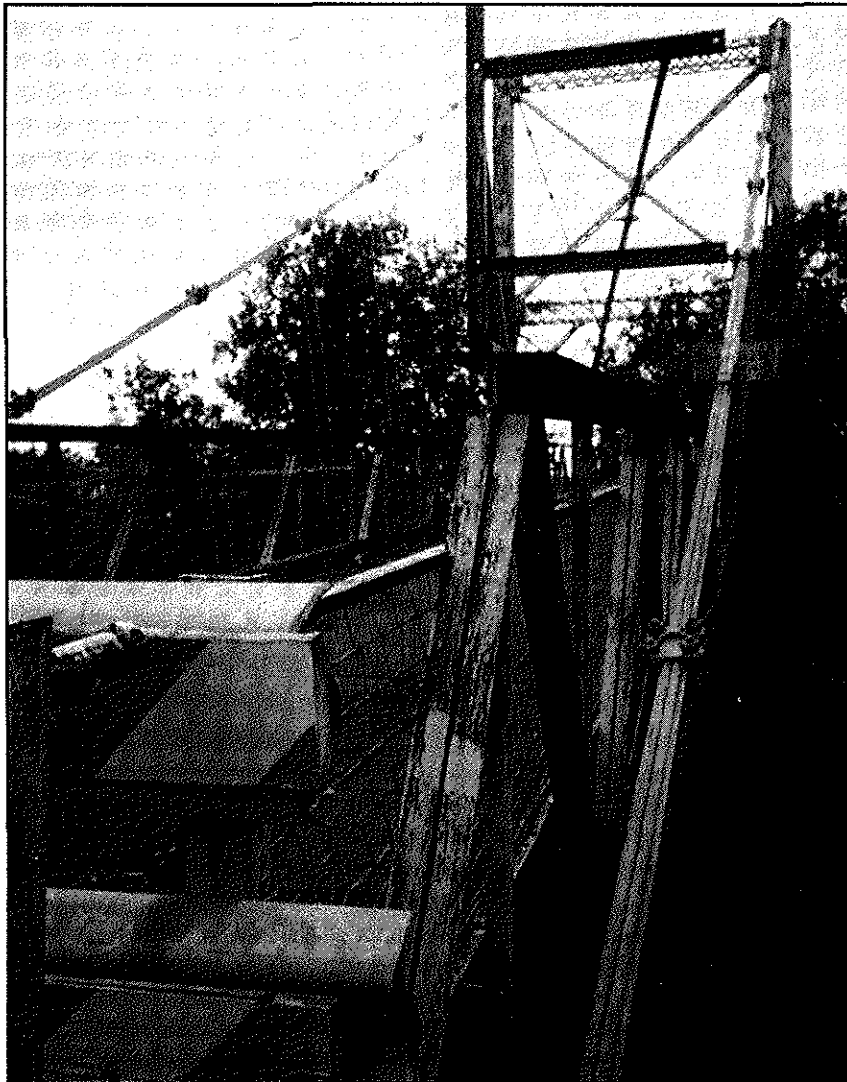
bound and held together. In the Cornwall bridge they are encased, "wrapped" by a heavy wire winding, so closely and firmly bound to make them impervious to water seepage.

Holton Robinson became the world's recognized expert engineer in suspension bridge cable design and construction. This operation included stringing the lesser cables from shore to shore over the towers; then in

"seizing" and then "squeezing" them, thus "binding" them together, and finally with his ingenious mechanism doing the "wrapping" of the outer wire covering, or encasement.

Well, to reduce the cost of construction and still provide a sound and secure bridge at The Center, Holton Robinson did not "wrap" or "wind" the group of lesser cables into two major cables. Instead, he used the "saddles" as "grippers" for the dual purpose of forming them into the major cables and at the same time using them for the saddles over which he looped the smaller suspender cables from which the super-structure is suspended. It all looks so simple! Actually a vast amount of technical skill and engineering techniques must be used to carry a given total of 125 tons; how each cable is anchored; the give and take of expansion and contraction for temperature changes. A close inspection of the lesser cables reveals how they consist of strands of heavy steel cable wire; that the wires are not strung straight, and parallel, but are twisted and wound much like a very heavy rope or hauser.

The famous Brooklyn Bridge is of the suspension-cable type. John Roebling and son, engineers of worldwide fame, designed and constructed that bridge. It required thirteen years to complete. The stringing of its mighty cables required twenty-one months. The big cables of the Cornwall Bridge over the St. Lawrence were strung in one month. Thus has modern bridge cable construction become sophisticated. But it took two months to "wrap" or "wind" those big Cornwall cables with wire encasement covering.



Courtesy of J. Rebecca Thompson

*Robinson's use of the "saddles" as "grippers" for forming the major cables and to support the suspender cables is still visible in 1999.*

During the preparation of this article, the writer has inspected two other Robinson & Steinman bridges, both in the state of Maine; one is the famed Waldo-Hancock Bridge at Bucksport, Maine, constructed in 1931 and receiving the award as the most beautiful bridge of its Class B type ever constructed at a cost of less than one million dollars. The other bridge connects the mainland in Pennobscot Bay with Deer Island. The cables of this latter bridge are constructed similar to the little bridge at The Center. They are not "wrapped", not encased; the lesser cables are naked to the eye.

So, in crossing suspension bridges take a quick look at the cables. Your life and those of all who pass over them depend upon those steel screws. A man who was born near The Center, over at Robinson Bay, made modern cablization possible. Of that and of him more will appear in a later issue of *The Observer*.

#### Editor's Note

The Massena Center Bridge still spans the Grasse River, but it has been closed to both motor vehicles and pedestrians for more than a decade. A newer bridge that better accommodates today's vehicles was built in the 1950s during the St. Lawrence Seaway project a short distance upriver, rendering Robinson's bridge unnecessary. Robinson, himself, acknowledged the limitations of the bridge. In August 1943 he wrote, "It is my wish to widen and improve its beauty and grace...; it will make a good post-war undertaking." And in September 1944 following the earthquake that struck Massena, he wrote a letter to a Massena correspondent

asking how "his bridge" had fared during the quake and noting that he still had in mind "widening and improving" it. Unfortunately, Holton Robinson died in 1945 and his improvements never came to pass.

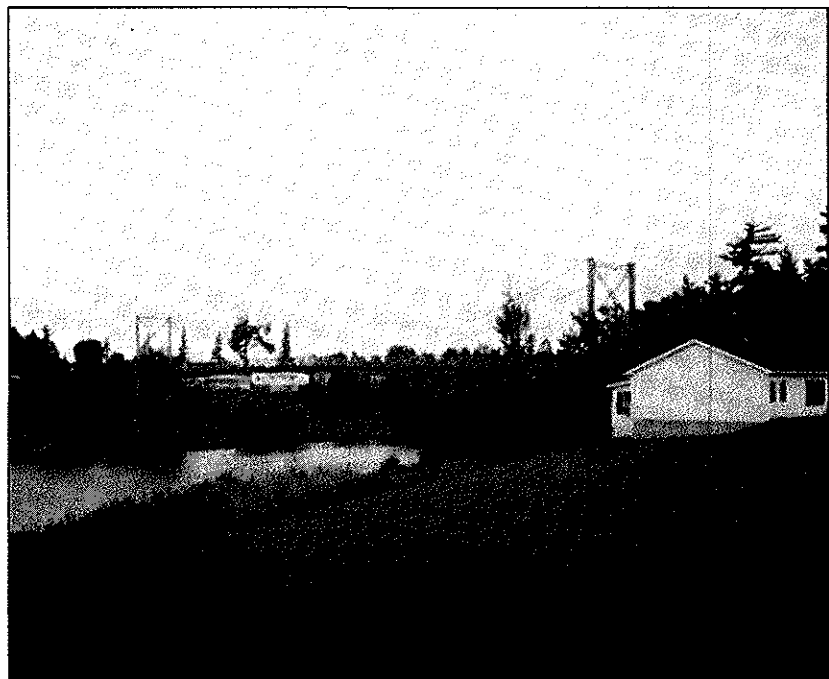
When one approaches the bridge today, its age and condition are all too apparent. Barricades block the entrance, the deck is full of holes, and trees obscure one's sight of the other side. But step away and take the long view. From this perspective, Holton Robinson's Massena Center Bridge is still a graceful and beautiful landmark spanning the Grass River.

#### Acknowledgements

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Quotations from Holton Robinson are taken from "And They Call It Progress" edited by Leonard H. Prince, printed in *The Massena Observer*, December 1974.

We thank Theresa Sharp, Massena Town Historian, for calling our attention to this St. Lawrence County landmark and Atwood Manley's article and for providing research assistance.



Courtesy of J. Rebecca Thompson

*Holton D. Robinson's Massena Center Bridge in 1999.*

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