A HISTORY OF THE GOOSENECK: THE BROWER SAP PIPING SYSTEM AND THE CARY MAPLE SUGAR COMPANY

By Matthew M. Thomas

The initial application of plastic tubing for gathering maple sap in the 1950s was indisputably one of the most significant technological developments of the maple industry in the twentieth century. However, the first viable tubing system was introduced over forty years earlier as a gravity drawn system made completely of metal. Invented in the shadows of the Adirondack Mountains near Mayfield, New York, by William C. Brower, Jr., the system carried sap directly from the tree to the sugarhouse through an interconnected series of specialized taps, tubes and connectors. Formally known as the Brower Sap Piping System, the pipeline was popularly referred to as the Gooseneck system because one of the key segments of the pipeline resembled the curved neck of a goose.

Born in Mayfield, New York in 1874, Brower was the consummate Yankee tinkerer and inventor. As a machinist, mechanic, and jack of all trades, his education did not come from the classroom, but rather, from trying to solve and improve on the problems and dilemmas he and his neighbors faced every day. Brower was also a sugarmaker, making him well aware of the difficulties of tapping and gathering sap with buckets and teams of horses or oxen in deep snow and on steep slopes.

After coming up with the idea of using the natural gravity of the mountains to eliminate the laborious task of hand gathering sap, it took Brower nearly three years of trial and error to perfect the system. The initial patent application occurred in December 1914. A year and a half later in June 1916, the United States Patent Office awarded Brower patent number 1,186,741 for his "Sap-Collecting System". Likewise, an identical application by Brower was awarded a Canadian patent in August of 1917.

In order to support the weight of the folded sheet metal tubing and the sap flowing through it, the Gooseneck pipeline was suspended by small hooks on a network of wires strung through the sugarbush supported by posts and trees. The wire used was usually a heavy gauge fence wire or reused telegraph wire. The labor required for set up at the beginning of the season was greater than that of traditional gathering systems using metal spouts, pails and covers; but this cost was easily made up with a reduction in labor for gathering as well as the elimination of sap lost by overflowing buckets that were difficult to tend to in deep snow and on steep slopes.

The pipeline quickly caught the attention of many sugarmaker's in the region; however Brower continued to manufacture the tubing and spiles out of his small workshop, limiting his ability to mass produce the system. According to his grandson, Brower was a man more interested and skilled in working with his hands than in promoting and selling his invention.

Following completion of the

pipeline design in 1914, Brower traveled from his Mayfield home to St. Johnsbury, Vermont to try and interest George C. Cary of the Cary Maple Sugar Company in using the pipeline in the large sugarbush on Cary's 4,000 acre farm. Initially, Cary was not interested, but Brower persisted, finally convincing Cary to try the system on 1500 trees during the 1915 maple season. As president of what was then, the world's largest maple sugar business, and as owner of one of Vermont's largest sugarbushes, Cary had the wealth, liberty, and interest in experimenting with more efficient and cost effective methods and equipment. After only one season of use, Cary was sold, placing an order for enough tubing to connect 9000 more trees. Ultimately Cary would have 15,000 trees on the pipeline at his North Danville sugarbush.

Continued satisfaction with the system led the Cary Maple Sugar Company to form a partnership with Brower in 1918, with the company providing the facilities and financing to expand production and sale of the pipeline. Although his family stayed in New York, Brower temporarily relocated to St. Johnsbury to direct production in this new venture. According to a promotional brochure, during the first year of production in St. Johnsbury, sales more than doubled and orders were coming in faster than they were able to manufacture the pipeline. The brochure goes on to say that many producers tried a small amount of the tubing at first but were so satisfied that they followed-up with much larger orders.

Owners of larger sugarbushes were especially interested in the system. In one instance an estimated 30,000 feet of pipeline was used in one 1,700 tap sugarbush.

With mass production in full swing, the 1920 prices for the system ranged from thirty-five to forty-two dollars for one thousand feet of half inch to one inch diameter pipeline, and seven dollars per one hundred for both spouts and Goosenecks. The half inch and one inch diameter pipeline sections came in three foot lengths with a manufacturer' estimated costs of sixty to seventy cents per tree.

An impressive endorsement of the quality of maple sugar one could make using the pipeline came from M.J. Corliss, the Secretary and Treasurer of the Vermont Sugarmaker's Association. At the annual meeting of the Association in 1926, Corliss noted that he had "been taking careful note and for the last two or three years it is a fact that the men who have carried off most of the blue ribbons or first prizes are the men who have used the piping system". One of the greatest strengths of the pipeline was the elimination of debris and the near immediate delivery of clean, fresh sap, which was especially important in the 1920s and 1930s when and our understanding of bacterial growth in sap and the tap holes was in its infancy and sap gathering was traditionally done with out the aid of engines and machines.

With the Cary Company's assistance and wide reaching influence, the pipeline began to make a dent in the equipment market. While, the

pipeline system never became as popular as tubing has today, it was added to the sap gathering process in a number of maple operations. A 1925 study of 457 maple producing farms in Vermont found that 18, or roughly four percent, were using the pipeline on some of their trees. In those 18 sugarbushes, an average of 28 percent of the trees were tapped with the pipeline, ranging from as few as 8 percent to as many as 75 percent of the trees. In that same year, pipeline users averaged 400 taps on tubing and had been gathering sap with the system for an average of 4 years. This study also found the average estimated value of the pipeline to be $268 or 67 cents per tap, which was consistent with the price estimate promoted by the Cary Company.

It is not clear when the Cary Maple Sugar Company discontinued its production of the pipeline; however, it may have been as early as the mid-1920. By the late 1930s, it appears that the Gooseneck system had fallen out of favor and was no longer used by many maple producers. George Cary himself went bankrupt and died in 1931, leading to the reorganization of the company and the sale of his farm and sugarbush. With the end of production of the pipeline in St. Johnsbury, William Brower returned to his family in New York, where he lived until his death in 1940.

The pipeline was used primarily in the northeastern states of Vermont, New York, and New Hampshire; however, the system also made it as far west as Wisconsin. Evidence of its use was recently found in the north-

ern part of the state on the Chequamegon-Nicolet National Forest. Archaeologists discovered spiles, Gooseneck connectors, rolls of wire, and thousands of sections of pipe from the Brower system at the former location of a late 1920s to early 1930s sugarhouse.

Like plastic tubing, it was important to not have any sag in the system where sap could collect in low spots and get sour. Some pipeline users reported that freezing was sometimes a problem, but that the metal warmed easily when the sun came out, quickly thawing the frozen sap in the pipeline. It was sometimes noted that at the end of the season sap gathered with the system was slightly sour and often had to be thrown away. Fallen limbs, ice, and deer occasionally disconnected sections of the pipeline, and the contraction of the metal in very cold conditions could result in the separation of the inserted pipe ends. Some maple producers stopped using the system because it was made from a kind of sheet metal known as Tern Plate, which was a combination of tin and lead. As one maple bulletin described it in 1949, "the use of such metal was strongly discouraged by State and Federal authorities for the processing of any food". In spite of these drawbacks, the benefits at the time were clear. For sugarmakers with large, steep, and hard to get to sugarbushes who kept their equipment clean and processed their sap quickly, the Gooseneck system was an excellent innovation. While the system added more work at the beginning and end of the maple season with longer set up times and additional cleaning, it eliminated the laborious task of gathering sap once or twice a day.

Improvements in sap gathering methods have long since replaced the Gooseneck system, but the pipeline has not completely faded into memory. On the Lent family farm near Mayfield, New York, the pipeline continues to be used on a few hundred taps to gather and transport sap from their mountainside sugarbush. It is no coincidence that the family still uses the system or that their sugarbush is near Mayfield, the community where Brower first invented the pipeline. In fact, the Lent family has used the pipeline for over 80 years with their farm and sugarbush located next door to Brower's former property. Many years after his death, the Lent family purchased William Brower's former home and the workshop where the pipeline was invented. Today, a New York State historic marker points out the location of the workshop alongside Mountain Road (Highway 123) northeast of Mayfield.

According to Lent family history, their ancestor, Edward L. Lent, worked with his neighbor Brower in the early 1900s to develop and improve the pipeline system, using the Lent sugarbush as a test site. Over the years the Lent family tried other methods of sap collection like metal pails, plastic bags, and plastic tubing, but has always kept a portion of their sugarbush on the Gooseneck system. At their peak in the 1980s, the Lent's gathered sap with the pipeline from approximately 2500 taps. More recently, they have discontinued commercial production and scaled back their operation to a few hundred taps. The spring of 2004

The Gooseneck metal sap pipeline in use during the 2005 sugaring season in the Lent Family sugarbush, Mayfield, New York. Copyright Matthew M. Thomas

was one of the first years that they did not tap, out of respect for the terminal illness and recent passing of the family patriarch, Edward W. Lent, grandson of Edward L. Lent. The 2005 season saw a return to the Lent family installation of the Gooseneck system.

As the preferred method of sap gathering in the modern sugarbush, plastic tubing has become commonplace over the last forty years. However, the basic idea, structure, and terminology of a sap gathering pipeline were established with the Gooseneck pipeline, setting the stage for the experiments with plastic tubing pipelines in the mid-1950s. In fact, one could argue that Brower would have probably chosen plastic rather than English Tin had flexible plastic PVC tubing been invented and available in the early 20th Century. In a flexible form, PVC tubing wasn't available for non-military use until after World War II. It wasn't until it became commercially available in the 1950s when pioneers like Nelson Griggs, George Breen, and Bob Lamb began to explore its application for gathering maple sap.

Information for this article came from historical research and interviews with members of the Brower and Lent families. Any questions or comments are welcome and should be addressed to Matt Thomas at maplematt@hotmail.com.