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The Man Who Stretched Chicago Steel Tape Around the World

By Marc S. Cheves, LS

The history of surveyors’ measuring devices stretches back thousands of years, evolving from ropes to wooden poles to metal chains and tapes. As the tools of the land measurers grew more sophisticated, so, too, did the technology and the production facilities in which they were made. When Dennis Nardoni of CST/Berger announced the sale of his company to The Stanley Works in January 2004, another chapter of “measurement” history was written.

Technology from Two Continents

The chapter begins in the 1840s with the work of several skilled tradesmen and businessmen on separate continents. The paralleled accomplishments of C.L. Berger of Germany, Frederick Trent Stanley of Connecticut, Daniel Wheeler & L.A. Nichols of Massachusetts, and Levi Sawyer of Chicago would eventually intersect some 160 years down the road.

Christian Louis Berger was born in Stuttgart, Germany in 1842, a descendant of a family that made arms and armor for the royals of Württemberg. At the age of 14 he began a ten-year apprenticeship with various European manufacturers of precision instruments, including F.W. Breithaupt & Sons of Cassell, Germany. In 1866 he emigrated to the United States and eventually established the instrument manufacturing firm of C.L. Berger & Sons in Roxbury, Massachusetts. The popular Berger instruments were widely sold, and were used to build the Panama Canal, Grand Coulee and Boulder dams, and the Golden Gate Bridge.

While C.L. Berger was growing up in Germany, an innovative businessman named Frederick Trent Stanley established a foundry in New Britain, Connecticut in 1843 to produce bolts and other hardware from wrought iron. The bolt “manufactory” eventually grew to become the company that is widely known today—The Stanley Works.

Not long after Stanley’s Bolt Manufactory was established, Daniel M. Wheeler was born in 1846 in Rutland, Massachusetts. Wheeler became a civil engineer whose firm designed bridges and railroads. While working on a survey team, Wheeler fashioned an experimental measuring tape from the steel ribbon used to make hoopskirt wire. Joining the survey team as a leveler was L.A. Nichols, a graduate of Massachusetts Agricultural College, who became head of the survey party in 1871. Nichols recognized the superiority of the steel tapes, and under Wheeler’s instruction, produced more of them and sold them to other engineers. The popularity of the tapes grew, and in the late 1800s, a company was formed in Chicago to produce them. Thus was the beginning of Chicago Steel Tape (CST).

A man by the name of Levi Sawyer purchased CST in 1903. In 1941 Sawyer’s son Charles, an attorney, took over the company after the sudden death of his father. Charles had a daughter named Claire, who at age 17 married her high school sweetheart, Dennis Nardoni, who was one year older. In 1963 Charles Sawyer brought his son-in-law on board to work for the company.

The lists on pages 18-19 show the early product line-up, costs for the manufacturing of chaining pin sets, and various yearly revenues. CST later added range poles and Chicago-style leveling rods to its product mix. It wasn’t long before Nardoni became the plant manager. At the time, half of CST’s production went to the Frederick Post Company, and Eugene Dietzgen was the main competitor.

In 1969, at age 26, Nardoni bought CST from the estate of Charles Sawyer. There were 26 employees in all, with eight who worked 11-hour days and a half day on Saturday in order to keep up the production of CST’s main product: handmade babbitt chains. An 18-month development process was started that resulted in the world’s first—and only remaining—babbit chain machine (see images on page 20-21). (Today, Nardoni says they only crank the machine up occasionally, but still have buyers within such groups as the USGS and the Corps of Engineers. He says that some users deal with muddy conditions and since they can’t see the numbers on the chain, want to be able to “feel the feet” as the chain passes through their fingers.) Because no new products had been added in many years, after an evaluation of the market, they began adding products.
Top: Early-day home of CST in Chicago.

Bottom: Original inventory pages that list CST’s product line-up and costs for making sets of chaining pins.
The 70s and 80s

Growth came steadily, and CST quickly outgrew its facility in South Chicago. In 1973 they moved 100 miles to its present location in Watseka, Illinois, which offered a very good labor market. As CST continued to diversify, it began importing Japanese tripods in 1974. But Nardoni realized that importing products required the company to keep an inventory that didn’t necessarily meet with demand. So, in 1976, CST began manufacturing its own aluminum and wooden tripods.

When Nardoni approached a major magnetic locator company in 1983 with some suggestions about how it could improve its product and become a major distributor, he was rather surprised by the negative response he received. Nardoni creatively responded by purchasing magnetometer technology from a West Coast company, United Scientific. Thus was born CST’s line of MagnaTrak locators. Two other important acquisitions were also made in 1983. First, CST acquired McHenry Systems of California for its prism glass manufacturing capability, followed by a premier machine shop, Watts Tool Product of Florida, which was moved to Watseka.

A vital key to the success of CST was building a talented team. In 1985, Ash

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Puri, a recent MBA graduate, was hired to develop CST’s export business and assist Nardoni with product management, and that he did. Exports currently account for between 20 and 30 percent of CST’s business and the product line has grown sixfold. Today, Puri is President and Chief Operating Officer. Another key hire was David White in 1983. White (no relation to the company of the same name), is in charge of sales.

**The 90s: Past Meets Present**

When the company outgrew its facilities in the 1990s, they purchased another building in Bradley, Illinois. That facility now houses CST’s primary machine shop as well as its plastic injection molding department. Turned and milled metal components, screw machine components, and injection molded components are manufactured there, all of which are utilized in the manufacturing and assembly operations in the Watseka facility. The Bradley facility also handles R&D and engineering for all of CST’s divisions.

In 1993, CST purchased Triad Industries of Redding, California for its GPS backpack, GPS antenna, and other ancillary surveying equipment line. This capability has since been moved to Watseka. In 1994, CST Germany was formed as a European distributor of CST products. In 1995, CST forged an agreement with a Chinese company for the manufacture of labor-intensive optical and laser instruments, as well as an agreement with a company in India to manufacture leveling rods, tripods and measuring wheels.

Here’s where the legacies of Berger, Stanley, Wheeler, Nichols, and Sawyer intersect. In 1995, CST bought the remaining portion of C.L. Berger & Sons, which had struggled to keep pace with the flood of electronic and less expensive foreign-made instruments that came on the market after WWII (as much as half of Berger’s production had been for Sears & Roebuck). The acquisition satisfied one of Nardoni’s original goals: to market a complete range of instruments and accessories to the construction supply market. Production of the Berger line was moved to Watseka. (Another interesting sidebar in the CST story involves the rescue of several dividing engines that were rusting away at the Berger factory in Massachusetts. Nardoni donated one to MIT, another to the Smithsonian, and two—a circular and a linear—were donated to the Museum of Surveying in Lansing. At the same time, Berger’s extensive...
records for the thousands of instruments it had sold were scanned and placed on CDs for posterity).

In 1996, CST entered the laser leveling market with its LaserMark line. A key acquisition came in 1998 when CST purchased 50 percent ownership of Laser Alignment in Grand Rapids, Michigan. The company, with 350 employees, was close to bankruptcy, but along with the acquisition came key patents for compensator technology. In 2001, after rapidly returning Laser Alignment to profitability, Nardoni sold his interest to Leica Geosystems. Also in 1999, CST of Italy was formed to handle distribution in that part of Europe.

The final acquisition took place in 2002 when CST purchased the bankrupt David White Company, known mostly for its do-it-yourself and professional builder instruments. Diversification in products, target markets and geographic markets has made the company virtually recession-proof. Nardoni also credits CST’s ability to control its own destiny by scheduling its manufactured product mix on a monthly basis to keep inventories low without compromising on its ability to deliver. Complicating this is the fact that many different versions of the same product are manufactured, thereby making forecasting difficult.

CST/Berger currently has 300 employees. With the construction industry strong, 2003 was their best year ever—a quantum change from the $250,000 in sales when Nardoni bought the company in 1969. Up until last year, CST operations were housed in four separate buildings—totaling 100,000 square feet—in Watseka. Last year they consolidated the operations into one giant 180,000 square foot building, finally bringing everything under one roof. Nardoni recently donated one of the former buildings—containing 36,000 square feet—to the Iroquois County Mental Health Board.

An International Network
A quick glance at the company time line demonstrates Nardoni’s vision to vertically integrate his company to enable growth, and to expand the product line to appeal to a broader base of customers. CST/Berger now has more than 2,000 dealers in 60 countries. Prior to 1975, CST never directly called on the dealers. To create the
network, it had to gain dealer confidence, and it did so by marketing directly to DOTs. This got the attention of the dealers—and resulted in the beginning of the dealer network expansion—but CST still had to come through with quality products, correct pricing and on-time delivery. Utilizing both in-house and offshore manufacturing capabilities, carefully calculating the effects of foreign currency fluctuations on imports and exports, and planning for strategic acquisitions have been key ingredients to Nardoni’s success.

Because instrument manufacturers exert a heavy influence on the industry, CST has responded by carving out a large market in the private label OEM arena, producing, over the years, tripods and poles for Sokkia, Leica, Topcon, Pentax, Nikon, Sears, Home Depot, Lowes, David White, Spectra Physics and Geotronics. Nardoni sympathized with the dealers and said they have a hard row to hoe as they deal with the instrument manufacturers’ attempts to control distribution.

So why sell such a successful company? Here’s where our story comes full-circle. With its wide range of lasers—more than 150 models, both rotating and straight line—CST had become the largest manufacturer of consumer and builder lasers. Between David White and CST/Berger, the company is number one in the builders’ market, making it an attractive “bolt-on subsidiary” for The Stanley Works. In addition, CST’s China opera-
tions would have required a $10 million investment—a scenario that Stanley, which already has nearly 3,000 shipping containers coming annually from China—was better situated to handle. And so it was that in January of 2004, Nardoni sold CST/Berger to The Stanley Works—a $3 billion company—for $63 million.

That’s the business side of the story. But there’s a personal side, too. Forty-three years later, Dennis and Claire are still married. Along with hard work, their success has also been mingled with deep pain. Their 19-year-old son Brian, who had started working at the company alongside his dad, died in a motorcycle accident in 1983. More recently their other child, a daughter with five children, unexpectedly lost her husband to diabetes. Those are the deep aches that keep financial success in perspective.

So where to from here? As one chapter closes another begins. For the past seven years, Nardoni has been involved in land development projects on the island of St. Lucia in the Caribbean, including a world-class golf course designed by Jack Nicklaus.

For an Italian kid who grew up in the Chicago Heights neighborhood known as Hungry Hill, it’s the kind of American success story we never grow tired of hearing, and a fascinating chapter in the ongoing history of measurement technology.

Nardoni today. On the desk in front of him is the small leather-bound book from which the early-day cost and revenue images were taken. Also shown is a hardcover Berger book that outlines various product specifications.