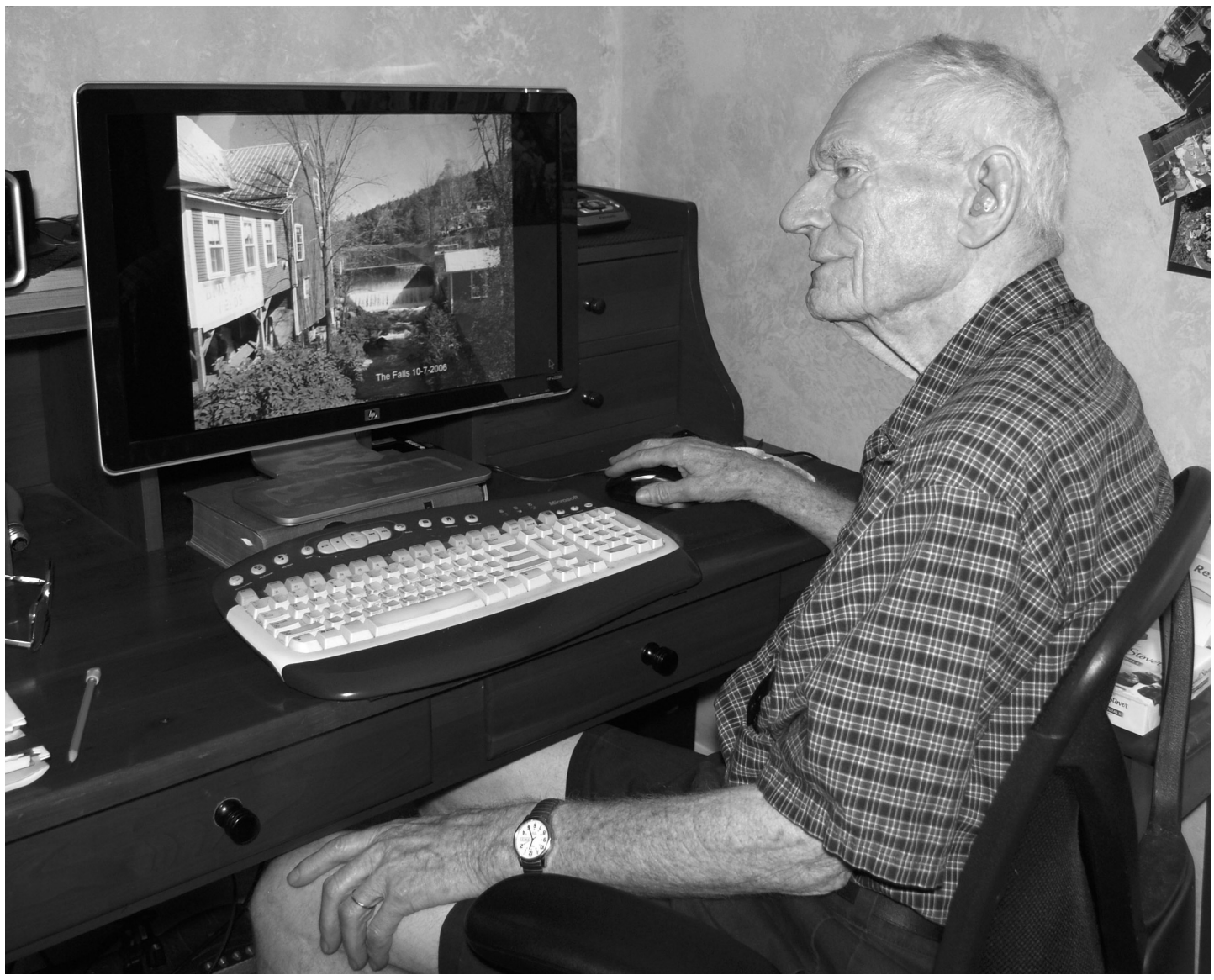
Before Green Mountain Power, Houghton Cate Had His Own 'Smart Metering'

by Ricka McNaughton



At his home in Burlington, former North Calais resident Houghton Cate displays an old photo of his hydroelectric system handiwork. Photo by Ricka McNaughton.

When rural electrification finally came to central Vermont, it came last to the regions with the smallest population densities. One such place was North Calais. With all of a handful of homes in the main village, North Calais was also where Houghton Cate, now close to 91 years old, lived most of his life. His parents were dairy farmers George Cate, who also served as town clerk, and Nina Cate, a teacher who was also the assistant town clerk. The closest commercial utility, Green Mountain Power, had strung transmission lines to nearby towns by the early 1920s. But a decade later, North Calais was still waiting. So, in 1936, young Houghton and his father did something that was technically remarkable for its time, and in many ways still is.

"We had a small river on the place, and we built a water-power system there," recounted Houghton, "and we used it to generate electricity to run the lights and the vacuum pump for the milking machines in the barn. We didn't have water enough to run the system day and night, but when we got the milking done, we could store any excess [power] and use it in the house."

It wasn't until three years later that the newly formed and eagerly awaited Washington Electric Cooperative, with an infusion of capital from the federal Rural Electrification Administration, brought power lines out to the rest of the populace of North Calais—as well as to other previously "dark" areas.

Water power itself was nothing new. Going back a century or so, if you and a collection of bold souls had just driven to Vermont by oxcart to carve out a new settlement, you'd head for a site near moving water—one with sufficient slope or containable force—that could power mills to saw lumber and grind grain. For most of its existence, hydropower used the energy of flowing water to turn interconnected wheels, shafts and belts that accomplished some kind of work on their own. When electricity became a commodity, the energy from water was used to spin turbines to produce electrical energy. It was a transformative technology, and, locally, the Cates were among the first to exploit it.

Because his eyesight was poor, Houghton never attended public school. His mother feared he wouldn't be able to read a blackboard and gave him his lessons at home. A born thinker and tinkerer, Houghton spent many absorbing hours on his own as a boy, fooling around with simple materials for producing electrical current. One day, a stack of books on electricity appeared for Houghton to study. "My parents told me to go at it," said Houghton. He eventually became a self-taught master electrician. In addition to wiring buildings, Houghton ingeniously repaired everything from commercial machinery to home appliances. He became a near-heroic figure, as time went on, to customers who resisted the newer habits of a throw-away society.

Around 1975, Houghton and his wife, Lorraine, purchased a home and adjacent feed store by a stream in North Calais. Next to it sat a small powerhouse not used since 1951. Despite a host of redesign challenges, it seemed like one more contraption worth fixing. So Houghton went at it.

Among other things, the dam needed repairs, and the water wheel needed an upgrade. "It would only turn at 180 RPMs," Houghton explained, "and we needed it to turn at 1,200 RPMs to get the right frequency for alternating current . . . we had to basically convert something designed for a manufacturing use to household use." This was solved with a mix of standard engineering methods and nonstandard parts, including a differential from an old Ford and something that may have come from an old ferris wheel.

As Houghton contended with electrical and mechanical matters, George, who was in his 80s by then, did not sit idly by. "Father was right there, way up on top of everything, banging away," said Houghton. With everything finally whirring and flowing, the restored hydro plant was able to power the feed store as well as the lights, heat, hot water and sundry appliances in the Cates' house. The river was monitored for adverse impacts, and, by all reports, the neighbors were happy to get their old mill pond back. The Cates lived there for about 25 years.

Houghton Cate's off-the-grid hydroelectric power system is still in use, now generating electricity for Fair Food Farm in North Calais. Emily Curtis-Murphy and Matthew Yetman, who currently lease the property, said their business would never have made it through last winter without the energy self-sufficiency that the hydropower system provided them. Houghton's beloved wife, Lorraine, passed away earlier this year, and he now lives with his son and daughter-in-law, Richard and Andrea Cate, in Burlington.

Emily Curtis-Murphy and Matthew Yetman now use Houghton Cate's off-the-grid hydroelectric system to generate electricity for their business, Fair Food Farm in North Calais. Photo by Ricka McNaughton.

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