Looking back... with Alun Hughes

SURVEYING MERRITT'S DITCH

The present Welland Canal, opened in 1932, is the fourth in a series dating back to the early 19th century. This essay is concerned with the original canal, with special emphasis on the first canal-related survey in 1818 and the beginnings of construction in 1823.

Background to the Canal

The First Canal was built in two stages, completed in 1829 and 1833. The initial portion, built between 1824 and 1829, ran from Port Dalhousie to Port Robinson, and then followed the Welland River to Chippawa. The main obstacles in construction were the 150-foot-high Niagara Escarpment (crossed by locks), and a ridge of higher land in southern Thorold between Port Robinson and Allanburg (crossed by an open channel called the Deep Cut). At first, water was to be taken from the Welland River, but that changed to a Feeder Canal from the Grand River following construction problems in the Deep Cut. The extension south to Port Colborne was built between 1831 and 1833. It should be noted that only two canal communities, Chippawa and St. Catharines, existed before canal construction had commenced.

Prior to the canal, goods in transit between Lakes Erie and Ontario had to be off-loaded and transported by portage around Niagara Falls. The original portage was on the east bank of the Niagara River, and was moved to the west bank in 1790 following the British loss in the American Revolutionary War. The portage was slow and expensive, and it was a major bottleneck in the trade route between the Upper Great Lakes and Montreal.

The idea of a canal had been mooted by Quebec merchant interests very early in the 18th century, but it was considered too costly and no canal was ever built. In 1793 Queenston merchant Robert Hamilton proposed a "tract road for dragging" along the Niagara River as part of a scheme to upgrade communications between Lake Erie and Chippawa. Included was a small canal to by-pass the Niagara River rapids at Fort Erie. In 1799 a petition by Hamilton, Forsyth and Clark led to a bill being presented to the House of Assembly, but opposition to the proposal from many individuals caused its withdrawal.

The War of 1812 saw much fighting in Niagara (Queenston Heights, Fort George, Stoney Creek, Beaverdams, Lundy's Lane, Chippawa and Fort Erie). The War ended in a stalemate, and led to lingering uncertainty along the border; in particular, a need for a secure lake-to-lake connection became urgent. This was heightened with the start of work on the Erie Canal in 1817, which threatened to divert Upper Lakes trade from Montreal to New York.

The principal force behind the Welland Canal was William Hamilton Merritt of St. Catharines. Beginning in 1815 Merritt had established a small industrial complex on Twelve Mile Creek, with grist and saw mills, a distillery and salt works. His mills suffered from chronic water supply problems, either too much or too little. Early on Merritt had the idea of cutting a supply channel through the ridge in southern Thorold to divert some Welland River water into the Twelve via Beaverdams Creek.

By 1817, when Scottish reformer Robert Gourlay conducted a questionnaire survey of local townships for his *Statistical Account of Upper Canada,* the channel had evolved into a canal to carry barges. Question 30 asked about land and water communications. Some Peninsula townships did not respond at all (e.g. Niagara), and some had no comment on the question (e.g. Thorold), but the Grantham committee, chaired by Merritt, proposed a canal linking the Welland River with Twelve Mile Creek. The consensus among the responding townships was that a canal would be beneficial, though there was little agreement regarding the route.

Merritt's Survey

In September 1818 (either the 18th or 28th) Merritt and others carried out an exploratory survey across the ridge in southern Thorold. It is often claimed that they were still thinking of a supply channel, but it is clear from the Grantham response to the Gourlay questionnaire a year earlier that it was seen as a canal. The plan was that the canal would proceed northward from the Welland River (also known as the Chippawa Creek), join the headwaters of Beaverdams Creek, descend the Escarpment near DeCew Falls and then enter Twelve Mile Creek, and reach Lake Ontario. It would not only provide a lake-to-lake link but also a surer supply of water for Merritt's mills.

A key question, which the survey sought to answer, was the height of the land between Port Robinson and Allanburg (though it must be repeated that the villages

did not exist in 1818). The ridge formed part of the Niagara Falls moraine extending all the way to Ancaster, comprising glacial till with stratified deposits of sand and silt. The canal would have to be excavated deep enough through this ridge to admit water from the Welland River.

Merritt was accompanied by several local people, including John DeCew, George Keefer, Hall Davis, Anthony Upper, George Couke and John Vanderburg. These were all landowners in Thorold, though not all owned land on the intended route. Like Merritt, DeCew had mills (a saw mill on Beaverdams Creek and a grist mill at DeCew Falls, though it is not certain that the latter had been built by 1818), and stood to gain a much-needed water supply. Keefer is said to have had a mill also, but proof is lacking. Significantly, Merritt, DeCew and Keefer all had surveying knowledge.

The field notes have survived and provide interesting insight into the methods used. They contain columns headed Courses, Distances and Rise and Fall, which indicate what was measured. The courses, or directions, were measured by magnetic compass (note the dominant N15°W direction). Distances were measured by a Gunter's chain, which was 66 feet (or 1 chain) in length, divided into 100 sections called links.

Rise and Fall denote changes in elevation along the survey line, and were measured using a water level supposedly borrowed from Samuel Beckett, miller in the Short Hills. (Strangely, the field notes refer to a theodolite, a much more sophisticated device, but the observations are consistent with a level. A water level is basically a U-shaped glass tube partly filled with water, mounted on a rod or tripod. By aligning the two water surfaces the surveyor could sight horizontally and take readings on a rod held vertically further along the survey line; the difference between the rod reading and instrument height gave the difference in elevation.)

In surveying parlance, what Merritt and his group did was to "run a line of levels" over the high ground. The results showed that the land rose about 34 feet above the water level in the Welland River, this over a distance of about 2.25 miles. The figure of 34 was something of an underestimate, but not nearly as great as the 60 feet some have claimed.

What is most interesting about Merritt's survey is the route that it followed, which was not the route eventually taken by the First Canal. It began at the apex of a meander in the Welland River, at Ebenezer Cavers' farm in lot 201 of Thorold Township. It then proceeded just west of north (an average of about N10°W) to link up with the headwaters of Beaverdams Creek.

Gathering Momentum

Merritt's survey was followed by a public meeting in October and a petition to the Legislature for a proper canal survey carried out by "some scientific men." The Twelve Mile Creek outlet was immediately challenged by people along the "Frontier," who stood to lose valuable inter-lake trade; a canal outlet at the Town of Niagara was suggested as an alternative. In 1821 the Select Committee of the Assembly recommended canal construction, but cautioned against a route too close to the border. This led to surveys, and in 1823 the Commission on Improvement of Internal Navigation reported on three projects in Upper Canada, including a 62-mile-long canal between the Grand River and Burlington Bay.

The possibility of a canal that did not pass his mills galvanized Merritt into action. Writing to his wife Catharine on March 9, 1823 he said, "The waters of Chippawa Creek will be down the 12 in two years from this time as certain as fate." Following a meeting held at Shipman's Tavern on March 22, a campaign was begun to solicit funds for a new survey. Merritt's immediate response was a mixture of pessimism and resolve: "Most of men have narrow minds. They cannot comprehend any measure beyond their daily concerns. They are fearful of imaginary evil, and do not dwell on the public good …. We have, however, determined on having the ground surveyed."

American Hiram Tibbett, who had been working on the Erie Canal, was engaged to perform the survey, and he reported in May. He surveyed two lines between the Welland River and the headwaters of Beaverdams Creek, presumably Merritt's original line and the eventual course of the canal. He then proceeded north-west down the Beaverdams Creek valley, and eventually descended the Escarpment near DeCew Falls into Twelve Mile Creek. Tibbett assumed a two-mile open cut of an average depth of 26 feet through the ridge, and an inclined railway to convey boats over the Escarpment.

Events began to move quickly, and a petition to the Legislature for creation of a company was submitted. The Welland Canal Company was incorporated in January 1824, with George Keefer as its first President and Merritt as its Agent. The company was empowered to acquire land for two canals and to select

mill sites. The primary canal was to run from the Welland River to Lake Ontario, and the secondary canal from the Welland River to Lake Erie at the Grand River. However, the routes were not specified, and the debate continued about the relative merits of the Twelve and Niagara routes.

A further survey was carried out by Samuel and James Clowes in April 1824. They proposed locks instead of an inclined railway and a tunnel instead of an open cut. Prophetically they stated: "The greatest obstacle to be overcome, and the only one worthy of consideration on this route is the dividing ridge between the Chippawa and the head waters of the 12 Mile Creek." Further reports by Francis Hall and Nathan Roberts followed in August.

The Tunnel to Nowhere

Much of Merritt's time was taken up trying to attract investors. By October 1824 key support had been secured in New York, and work on the Welland River-Allanburg section was put out to tender. The decision about a cut or tunnel was dependent on proposals received. On November 15 the first contract was signed with Alfred Hovey of Montezuma, New York, who favoured a tunnel. And so a tunnel it was to be.

Construction began on November 30. On the same date a ceremony marking the turning of the first sod was held at the head of Beaverdams Creek (subsequently Allanburg), at which Merritt delivered a lengthy speech. After the ceremony participants repaired to Badgeley's Tavern at Black Horse Corners for a dinner and more speeches, where "toasts were proposed and unanimously carried."

Tunnel entrances were excavated at either end of the tunnel line and shafts were sunk in between; it is not clear if this was just to test the nature of the subsurface, or to provide extra working faces (i.e. a shafted tunnel as opposed to a two-ended tunnel).

What is most interesting is the fact that the route of the tunnel matched the line of Merritt's survey, which of course is not the route that the canal eventually followed. It began in lot 201 on a farm belonging to John Brown, who had bought land from John Street in 1823, the latter having bought it from Ebenezer Cavers in 1821. The evidence for this is twofold: (i) anecdotal reports in the *Jubilee History of Thorold Township and Town*; and (ii) John Brown's evidence to the Board of Arbitrators established in 1826 to assess claims for damage caused by the First Canal.

Not long into 1825, however, the tunnel was abandoned. A tunnel would allow barge traffic only, and although the dimensions were increased at an early stage (the width from 9 feet to 15 feet, and the depth from 4 feet to 6 feet) to match boat sizes on the Erie Canal, this was a severe limitation. The company was under increasing pressure, especially from American investors, to make the canal large enough for schooner navigation, which would require a cut instead of a tunnel. The last straw may have been a collapse in one of the shafts, possibly water-induced, that killed a worker, though proof of this is lacking.

On February 13 Merritt wrote to his father-in-law: "I have consequently changed the whole scheme or system of our canals," even though "this deep cut is a more expensive job." He also mentioned the need for haste, lest a cheaper alternative route "which shall be nameless at present" be adopted. The alternative route was thought to be Ten Mile Creek, which coincidentally became part of the route of the Fourth Welland Canal.

Completion of the Canal

Work resumed in July on an open cut along a new route, west of the previous one. The reason for the route change is not clear, but it may have been related to planned harbour facilities on the Welland River.

The enlargement of the canal caused new problems. Schooners were too big to be carried across the Escarpment by a railway, which meant that locks had to be substituted. But there was no room for the required locks and reaches alongside DeCew Falls. Ignoring continued opposition from Niagara, a new route was chosen from Allanburg (which by then had come into being) north into Thorold Township and laterally down the Escarpment to a tributary of Dick's Creek, which flowed into Twelve Mile Creek.

The new route ran alongside Merritt's mills, but by-passed John DeCew's mills altogether (DeCew subsequently sued the Welland Canal Company and received generous compensation). But the person who gained most from the route change was George Keefer, for the canal went right through the middle of his land in the northern part of Thorold Township; he took advantage of this to build a grist mill and found the Village of Thorold.

The intention was still to take water from the Welland River, but serious landslides in the Deep Cut, especially late in 1828 when work was almost complete, made this impossible. Ironically, the Deep

Cut could not be excavated deep enough to allow a sufficient amount of water from the Welland River to flow in. The solution was to bring in water at a higher level from the Grand River, through what became known as the Feeder Canal. Work on the secondary canal between the Grand River and the Welland River was already underway, so this was not a major problem, though it meant crossing the Welland River by an aqueduct (at what became The Aqueduct, later the village of Merrittsville and still later the town of Welland). The changes left the portion of the canal through the ridge higher than the rest, and two locks had to be added at Allanburg, and one lock on the connection to the Welland River at Port Robinson.

On November 30, 1829, five years to the day from the sod-turning, the first ships (the Ann and Jane and R. H. Boughton) reached Chippawa — they had entered the canal from Lake Ontario on the 26th. (For the story of the opening see my previous article in the 'Looking Back' series entitled "The Opening of the First Welland Canal," published in December 2007.)

Meanwhile the tunnel workings were filled in or allowed to decay. A small gully just west of the Canby Street/Allanport Road intersection in Port Robinson is likely all that remains of the tunnel that went nowhere.

Principal Sources: (in addition to those cited in the text):

Credits: maps and layout (Loris Gasparotto); editing (John Burtniak).