Gentlemen Engineers: The Working Lives of Frank And Walter Shanly

by Richard White

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The Engineering Institute of Canada (EIC) published in 1957 a book called *Daylight Through the Mountain,* which contains an account of the lives and letters of the Shanly brothers, edited by Frank Walker and researched by Gladys Walker. As the Walkers noted, Walter Shanly was - at the age of forty - the general manager of the longest railway in the world and was later to sit as a member of Parliament, while Frank Shanly built more miles of railway in Canada than any engineer prior to the construction of the transcontinental railway to the Pacific. Both were also successful consulting engineers. But this book is devoted principally to the brothers' letters and the narrative material is limited to the first 60 of its 400-odd pages.

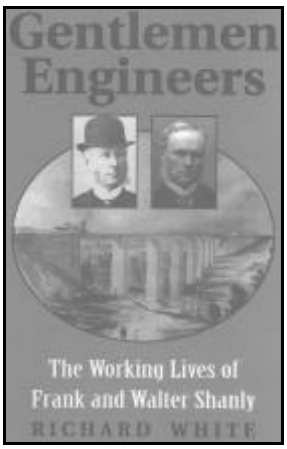
More recently, the lives of the Shanlys have been captured by Richard White, who has also made an important contribution to the history of the beginnings of the engineering profession in Canada by devoting 200 pages of his book to an eminently readable and strongly narrative biography of the brothers, followed by 50 pages that include the index and bibliography as well as extensive textual notes. The selection of photographs is also interesting. As well, White's book has a strong element of social history, not only of engineering in Canada in the mid-to-late 19th century, but also of the transition of a family with roots in the rural Irish gentry into a group of related individuals operating as North American urban professionals. The research for this book was originally done for academic thesis purposes within the Department of History at the University of Toronto. White is currently a free-lance historian and university-level teacher.

The book is in three parts. The first covers the Shanly family background in Ireland and its emigration to Canada. It goes on to describe how Walter and Frank learned the business of engineering and the contributions both made in the mid-1850s to the building of what became the Western Division of the Grand Trunk Railway of Canada. The second takes Frank's career from 1855 until his sudden death in 1882, and Walter's from 1855 until his death at forty-four years. The third part is quite short and is a discussion of the author's thesis that the Shanly brothers were indeed gentlemen engineers.

White notes that the Shanlys were originally Celtic Catholic gentry whose lands were confiscated by the English. By the time James Shanly and his family emigrated to Canada in 1836, they had become Anglo-Irish and Anglican. In Canada they were part of the British group. James had been a city lawyer in Dublin who turned to rural estate management and lived relatively well in this profession and as a country gentleman. He and his first wife had eight children, of whom Walter was the fifth (born 1817) and Frank the last, at whose birth (in 1820) Mrs. Shanly died. With his second wife, James has three more children.

The emigrants included the parents, the five surviving boys from the first family, and two boys and a girl from the second. Their reasons for leaving Ireland were complex - the influence of Irish politics, the loss of the family lands, the prospect of an insecure retirement for James, and lack of career opportunities for the seven boys in the family. After a number of stopovers on the way, James built a substantial home and farm at Thorndale, north of London, Ontario, intending to establish a life-style as a country gentleman and a secure base for his large family. But in these he was not successful. The problem lay, in White's view, not in the desire of James Shanly to be a gentleman in Canada, but in trying to be a country gentleman. Nor, after the first enthusiasm for the pioneering life had worn off, did the situation appeal to the younger generation and, one by one they left home.

Walter had made friends with a neighbouring family, also from Ireland. But two years after arriving, Hamilton Killaly had given up farming and returned to his original profession of civil engineering. He worked first on the Welland Canal and, in 1840, was appointed to chair the new Board of Works for the Province of Canada. Later that year, he took Walter - then 23 - to Montreal with him to begin his training as civil engineer. His first two jobs - with the Board of Works on the Chambly Canal and with the Trustees of Montreal Roads - were short-lived. However, in July 1841 he was appointed to the engineering staff of the Beauharnois Canal. This was to be his first long-term job, and the one on which he learned to "engineer" in the professional sense. When it ended for him in November 1845, Walter had done what he set out to do and now called himself a civil engineer. The Board continued to employ him on different assignments until the summer of 1846 when, following the replacement of the Board by the Department of Public Works, he was assigned to the Welland Canal to work under Samuel Keefer.



Frank's decision to become a civil engineer took longer to reach than his brother's. In his younger years and in comparison with Walter, he was bolder, less disciplined, less reliable and more attracted to fun and parties and the sowing of "wild oats" than to work. Frank did work periodically on the family farm and, from 1840, in the small milling and distillery enterprises set up by his father at Thornbury. He also had jobs away from home. But by the summer of 1846 he had written to Walter to ask what he should be studying to enter the civil engineering profession - and about job prospects in it. Neither Walter nor Killaly was able to help Frank regarding the latter. But by the end of the year, at the age of 26, he had found himself a temporary position on one of the preliminary surveys for the Great Western Railway, working out of Hamilton, and left home for good. This job lasted until August 1847. Frank then tried, unsuccessfully, to find work in the United States before accepting an offer from Walter to assist him on the Welland and to study some more for the profession. This was the first - but by no means the last - time the brothers worked together. For both of them, this job ended in July 1848 when the Department ran out of money.

By October Frank had found work as an office assistant with the Northern Railroad of New York on the construction of its line from Ogdensburg to Rouse's Point on Lake Champlain. He reported back to Walter that the company wanted him as well and, in November, he joined the project and initially took charge of the Eastern Division. This was Walter's first railway job. But he found that, while some parts of the job were new to him, much of his canal experience could be applied to railway construction. In the spring of 1849, after reorganization within the company, Walter became the resident engineer for the western part of the line, with Frank as his assistant. At this time, Frank was gaining valuable experience in construction management, but was weak on design. Walter did all he could to supplement Frank's knowledge and experience in both of these aspects of civil engineering. Fortunately, he was a fast learner. Walter remained with the Ogdensburg line until January 1851, when he came back to Canada to be chief engineer of the proposed Bytown and Prescott Railway. Frank had moved on over a year earlier to work on the enlarging of the Union Canal in Pennsylvania, where he remained until November 1851. Around this time he began calling himself a civil engineer.

Looking back on the brothers' apprenticeships "on-the-job," Richard White concludes that ....."All in all, it was an unpredictable and uncertain process that Frank and Walter had to follow to become engineers. Unregulated the profession may have been, but easily accessible it definitely was not. In fact, seeing how precarious the process was for Frank

and Walter, as well as how completely the profession was controlled by established engineers, one is tempted to think that gaining entry to it in those unregulated years was harder than it would become later in the century after formal education and strict professional accreditation had been established." At the same time, White concludes that Walter had a much stronger commitment to independence within the profession than had Frank.

In the case of the Shanly brothers, it is also important to add that their ability to learn and practice engineering was helped significantly by the "off-the-job" classical education they had received privately in Ireland and by observation of how their father combined the law with estate management accounting, report writing and other personal skills.

From 1852 to 1856 the Shanly brothers engineered the railway that began life as the Toronto and Guelph. It later became the Western Division of the Grand Trunk Railway and was extended from Guelph to Sarnia. Walter was chief engineer of the Division, and Frank a step below him as the resident engineer. In White's view, it was the GTR project that proved their competence as well as their separate abilities and set them up for the rest of their careers. It was also a period during which the Shanly brothers worked closely with Casimir Gzowski, whose company held the construction contract for the line. His methods were not always acceptable to Walter who, generally speaking, did not have a high regard for contractors. But after administrative changes affecting the Western Division and the contract, Frank effectively worked for Gzowski rather than Walter - who, by then, had begun to build an extensive railway and canal consulting practice that occupied him on and off for the rest of his career. For Frank, the GTR project also represented an end to his "wild oats" years - but not to his risk-taking, expensive habits or debts. He was married in September 1853 and over the next 20 years he and his wife had eleven children, not all of whom survived childhood. Walter never married. In 1856, Walter was 39 years old and Frank 36.

After the GTR and some "lean" months, Frank went to work for the next three years for the Welland Railway. Not sharing his brother's disdain for contracting, Frank then contracted to reconstruct the Northern Railway's line from Toronto to Collingwood. By the time this work was finished in 1862, the civil war in the United States had reduced the demand in Canada for the new railway and other construction. So for the mid-1860s - and having money problems - Frank turned to consulting.

In 1856, while still employed on Grand Trunk work, Walter undertook to lead a survey, for the Department of Public Works, of a canal route from Ottawa to Georgian Bay by way of the Mattawa and French Rivers. However, early in 1858 and before the canal report was written, he was appointed general manager of the entire GTR system. But problems within the senior company management led to Walter being appointed general traffic manager, but still the principal manager within the GTR. The GTR's troubles continued and, following a royal commission report, Walter resigned in March 1862. For him, it had not been a major accomplishment. Surprisingly, however, instead of returning to civil engineering he turned to politics and to business.

Grand Trunk Railway Bridge over River Eramosa at Rockwood, Canada West, c 1860. One of the splendid stone-piered bridges built by the Shanly brothers.

Both Frank and Walter Shanly ran as conservatives for senior elected political office - which was rare for engineers and always has been, and possibly unique for engineer brothers. Walter was elected to the Legislative Assembly of the Province of Canada in June 1863 as the representative of the South Grenville riding, where he owned property. In 1867 he was elected to the House of Commons for the same riding. He ran again in 1872, but was defeated, as was Frank in his one and only attempt to win the Toronto Centre seat. As an engineer, Walter's presence as a parliamentarian was appreciated and his committee assignments reflected his professional, consulting and business expertise. He spoke in the Assembly and the House principally when matters involving this expertise arose. He took little part in most debates on national issues.

In the summer of 1865, Walter Shanly was elected president of the Edwardsburg Starch Company in Eastern Ontario - a position he held for over 20 years. ESC was a small industrial concern founded by two English immigrants in 1858. Over the years, it was a successful venture whose interests Walter supported in the House of Commons. Walter also became interested in the Mechanics' Bank in Montreal, which did reasonably well during the good years of the 1870s but which failed in 1879.

The civil engineering project for which the Shanly brothers are perhaps best remembered is the construction of the $5 million, five-mile long Hoosac Tunnel near North Adams, Massachusetts, the story of which White tells in his chapter on Walter's later career. Originally, Frank and Walter formed a partnership to bid on the Hoosac job, although it was Walter who pursued the contract. It was signed on Christmas Eve 1868. The following morning that Walter wrote a letter to Frank in which he said..... "If there is any of the old fire left in us, we must wake it up in this Hoosac business. I believe we can let daylight through the mountain in four years....."

It took six years to excavate the tunnel to its full size. Walter had to carry the main construction management burden after Frank dissolved their partnership in October 1871, having found - White suggests - that working with his brother was less enjoyable than it had been earlier. Frank had also undertaken other railway construction contracts in Pennsylvania and Ontario with other partners, in the course of which he managed the laying of many miles of track. But in doing so he acquired significant debts. By March 1873, Walter was actively helping to mitigate these, in part because he had co-signed some of the bank loans. Frank was saved, but his career as a contractor was effectively over - to his great disappointment. In White's view, the major problem was that Frank could never keep a job on schedule and the delays that occurred added to his costs.

By 1875 Frank had returned to consulting, doing mostly inspections and post-contract arbitration. But in October of that year, he was quite unexpectedly appointed engineer to the City of Toronto, with primary responsibility for street paving and sewer construction. The problem in this case was that, while he knew civil engineering, he was not used to being an employee or having politically elected people tell him what to do. He remained a consultant and put together several contracting proposals, taking time out from his regular work to pursue these projects. The city fathers were not impressed. He was freed from them in June 1880 when he was appointed chief engineer of the Intercolonial Railway, with the job of sorting out contractors" claims that had remained unsettled since the line's completion four years earlier. He was able to have his son, Cuthbert, appointed as his secretary. He travelled by overnight train between his home in Toronto and his office in Ottawa on a regular basis. But the pace of his life and work, as well as financial problems and Cuthbert's death from tuberculosis in August 1882, contributed to his own sudden death a month later at the age of 61 during one of these train trips. It fell to Walter, as executor, to settle Frank's business affairs and to provide for his young family. White concludes that..... "vain and proud Frank Shanly may have been, but he was undoubtedly and honourable man. His word was good.....If there is one sentiment that stands out in the letter of condolence Walter received from Frank's colleagues it is that Frank was admired for his integrity...."

Walter retained his seat in the House of Commons during most of the Hoosac years. His second defeat - in 1874 - coincided roughly with the end of the project. Consulting work was rare for him during these years but, when they were over, he undertook more of it - by necessity - since contracting had lost any appeal it may once have had. Consulting also gave him independence. In 1885 he re-entered politics, winning back South Grenville in a by-election. He retained the seat in 1887 but retired from politics before 1891 election.

Of particular interest to the Engineering Institute of Canada is Walter's part in the passage through the House of Commons of the charter incorporating the Institute's predecessor, the Canadian Society of Civil Engineers during the first months of 1887. The June 1937 issue of the Engineering Journal celebrating the 50th anniversary of the founding of CSCE reported that.... "The charter was carried through Parliament by one of the vice-presidents, Walter Shanly, M.P., and received Royal sanction June 23rd, 1887." In the years since then, Walter has been given varying degrees of credit for the passage of the CSCE bill. But the evidence sited by Richard White suggests that he did little more than introduce it. Given Walter's views on professionalism in engineering, White also expresses surprise that he took only a small part in the founding and management of the Society itself. He had, however, passed his 70th birthday in 1887 and was winding down his professional and business careers. Yet the reports of the annual meetings in the late 1890s indicate that he was still taking an active part in the CSCE discussion on professional status.

"Such is the curse on those who live through changing times".

As Walter's career wound down, he turned to historical research as his principal activity. He wrote about military affairs and the Loyalist settlers in Canada. He also wrote about his family's past although, with the exception of brother Frank and half-sister Ellen (Nell), he had not been close to his own or to the younger generations of it. He made his home in Montreal and died there on 17th December 1899 at the age of 82.

Richard White identifies two main themes in his narrative. He does this for good reasons - and, up front, in the Preface to his book. The first is that during the Union period before Canadian Confederation there was..... "a much more mature and respectable (civil) engineering profession than historians have heretofore recognized." It was not formally organized until 1887 and it predated the profession - based on mechanical and other disciplines as well as the civil one - that emerged from the industrialization of the later 19th century. The second is that members of the old landed gentry who emigrated from the British Isles to Canada during that same century struggled to make the transition....."to the culture of modern industrial capitalism." These themes, White maintains, support his thesis that the brothers were indeed gentlemen engineers and that they were gentlemen before they were engineers. But White also says, in the last paragraph of his book...."the story of Frank and Walter Shanly is not a happy story. It may be one of accomplishment, but it is not one of fulfillment. Neither Frank nor Walter ended his life in circumstances he would have chosen..... (Their) unfulfillment and thus their tragedy comes not so much from their financial failures as from their maladaptation. Like their father, they were most at home in the generation from which they came. Such is the curse on those who live through changing times.

So this book raises two much broader questions. First: how well have immigrant engineers as a group adapted to the Canadian environment? And second: how well have Canadian-born engineers adapted to changing times? But it also raises a third question: now that we have two substantial works on the Shanlys, who's next?

Reviewed by Andrew H. Wilson
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Véhicule tout-terrain amphibie de l'écurie « ÉTS »: des étudiants se préparent à la compétition de Mini Baja

Montréal - le 10 mai 2000. Une équipe d'étudiants de l'ÉTS participera à la compétition 2000 Mini Baja East les 11, 12 et 13 mai prochain au Mont Chanteclerc à Sainte-Adèle où elle se mesurera à 37 autres équipes provenant d'universités canadiennes et américaines. Contrairement à ce que son nom peut laisser imaginer, un Mini Baja n'est pas un petit génie sorti d'une lampe magique - bien qu'une bonne dose de génie soit utile à sa conception - mais plutôt un véhicule tout-terrain amphibie faisant chaque année l'objet d'une compétition régionale de la prestigieuse Society of Automotive Engineers (SAE).

Pour les participants, le défi consiste à concevoir et à construire en équipe un véhicule tout-terrain capable d'affronter l'eau et les terrains les plus accidentés. « Cette compétition propose un projet stimulant qui comporte des tâches de planification et de fabrication propres à l'introduction de nouveaux produits industriels sur le marché » explique René Legault, Directeur de Recherche et Développement chez Paradox Security Systems et diplômé de l'ÉTS, qui est l'un des co-organisateurs de l'événement. « General Motors, l'un des principaux commanditaires de l'événement, en profitera d'ailleurs pour organiser un souper et faire sa campagne de recrutement auprès de ces futurs ingénieurs » ajoute-t-il. On estime qu'il faut un budget d'environ 30 000 $ pour organiser cette compétition et coordonner le travail des nombreux bénévoles. Parmi les autres commanditaires principaux, on retrouve SAE, Briggs & Stratton, Honda, l'ÉTS, Paradox Security Systems et Novabus.

Pour l'édition 2000 du Mini Baja, chaque équipe a reçu un moteur de 10 Hp de la Briggs & Stratton Corporation au mois de février dernier. Ce moteur ne doit subir aucune modification. Toutefois, dans le respect de quelques règles strictes de conception et de sécurité, les étudiants ont le champ libre pour la conception de plusieurs éléments du véhicule et pour le choix des matériaux. Dirigée par Hugues Maltais, finissant en génie mécanique, l'équipe de l'ÉTS compte 10 membres qui travaillent depuis juin dernier à la conception du châssis de leur Mini Baja. L'équipe a repris le design du véhicule utilisé lors de la dernière compétition - design qui a déjà fait ses preuves - en y apportant quelques corrections. Cette transmission des connaissances d'ex-participants du Mini Baja aux nouveaux participants permet d'améliorer sans cesse les performances du véhicule.

Échelonnée sur trois jours, la compétition comporte des épreuves statiques et dynamiques ainsi qu'une course où les véhicules doivent effectuer le plus grand nombre de tours en 4 heures sur un parcours accidenté créé spécialement pour l'occasion au Mont Chanteclerc. Les épreuves sont destinées à mesurer l'endurance, la force, la manœuvrabilité sur le terrain et dans l'eau, la suspension, l'accélération et le freinage. L'une de ces épreuves consiste à remorquer un autobus Novabus en position neutre sur une distance de 40 pieds !

La compétition Mini Baja a lieu trois fois par année en Amérique du Nord dans trois régions différentes : Ouest, Centre Ouest et Est. Seule la compétition de l'Est exige des participants qu'ils conçoivent un véhicule amphibie. Par ailleurs, à tous les trois ans, Montréal se retrouve l'hôte du Mini Baja. En 1999, l'Université de Sherbrooke a remporté la palme à la compétition de l'Est et l'équipe de l'ÉTS s'est classée parmi les 10 meilleures équipes. L'ÉTS participe également à la compétition dans le Centre Ouest qui rassemble plus de 100 participants chaque année; elle s'y est classée 3e sur 102 à la dernière compétition. Outre le prestige rattaché à cet événement, les participants ont l'occasion de mettre en pratique leurs apprentissages, de démontrer leur savoir-faire et de rencontrer des employeurs potentiels.

Hugues Maltais est confiant que le véhicule de l'ÉTS a toutes les chances de se classer parmi les meilleurs à cette prochaine édition du Mini Baja. Nous espérons que le génie - dans tous les sens du mot - sera au rendez-vous pour lui et pour ses co-équipiers à Sainte-Adèle!