

MAJOR JOHN LESLIE (LES) CHARLES (1892-1992) AN EXTRAORDINARY CANADIAN RAILWAY ENGINEER

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January 2024

Introduction

Canada has been blessed with exceptional railway engineers who have long been recognized for their achievements. These include **Sir Sanford Fleming** (1827-1915), **Sir Casimir Gzowski** (1831-1898), **Walter Moberly** (1832-1915), **Henry Cambie** (1836-1928) and **Andrew McCulloch** (1864-1945). The name **John Leslie (Les) Charles** (1892-1992) should be added to this list. Charles' 65 year-long career (1910-1975) spanned the evolution of railway route selection being carried out on foot, by canoe, horse and dog sled, to airplanes and helicopters. He saw wooden trestles become steel bridges and locomotives turn from steam to diesel.

Throughout his career, Charles recognized the value of geotechnical engineering and in 1982 he was interviewed by the Canadian Geotechnical Society for its Canadian Geotechnical Heritage Project. Most of what follows comes from either Charles' hard-to-find 1978 memoir or the 1982 interview. (A draft transcription of the interview is on the same web page as this article.) Although this article briefly summarizes his entire career, it focuses on his involvement with the Hudson Bay Railway. Note that railways in Canada still use miles and most of the references refer to miles. For this article, I have converted miles to kilometres (1 mile = 1.6 km). Kilometre posts (KP), provided in brackets, are approximate.

Early Years

Charles was born on December 15, 1892, in Weybridge, England, approximately 30 km southwest of London. After his public schooling, he worked briefly with an engineering and contracting firm on water and sewer projects near his hometown.

Through a family connection, he met **Leonard Silcox**. Silcox was a British-trained civil engineer who was visiting home from Canada where he was working in Saskatchewan and Alberta on locating and constructing the Grand Trunk Pacific Railway (GTP), now a part of the Canadian National Railway (CN) system. Silcox got Charles "all fired up" (Charles' words) about Canada and the opportunities for working on railway construction.

Early Railway Years

So, in early 1910, at the relatively young age of 17, Charles sailed from Liverpool to St. John, NB, and travelled by train across the country to Edmonton. He was immediately hired by the GTP. His first project, from April to December of that year, was as a chainman surveying the location for, and construction of, a portion of GTP's branch line from Tofield (east of Edmonton) to Calgary. (The Tofield to Camrose section of that rail line is no longer in service.)

Starting in January 1911, Charles worked, first as a rodman and then as an instrument man/leveler on two GTP branch lines west of Edmonton. From fall 1911 through to spring 1913, he was the instrument man/leveler for a 160 km-section of the GTP mainline in the upper Fraser River valley of British Columbia, part of what is now the CN main line to Prince Rupert. Charles worked directly under the aforementioned Silcox, who was the location engineer on that project.

Except for a few days in Edmonton over Christmas 1910 and a few weeks when he returned to England over Christmas and New Year's 1912-1913, Charles worked six days a week throughout the year, living in bush and work camps. What an introduction to his first three years in Canada!

Hudson Bay Railway

In May 1913, Charles was transferred to work on the Hudson Bay Railway (HBR), on which the location and construction had started two years earlier. The rail line was proposed to run approximately 700 km northeast from The Pas in western Manitoba to Port Nelson on the west shore of Hudson Bay. It was to provide prairie farmers access to a saltwater port to export their grain.

Charles worked as a transit man, again for Silcox. Before the survey party could start its work, they had to canoe approximately 350 km down the Nelson River system from Norway House to Manitou Rapids. Manitou Rapids (now flooded by the Kelsey Dam) is now 385 km along the rail line from The Pas (The Pas is KP 0). Over the next 15 months, the survey party, supported by canoes when the rivers and lakes were ice-free and by sled and dog teams when they weren't, worked its way eastward approximately 315 km towards Port Nelson, arriving there in August 1914. Throughout this time, the survey party worked six days a week, living in tents even when temperatures reached minus 50 degrees Celsius.



Charles at HBR survey camp in 1914
(source Wikimedia Commons)

In September 1913, Silcox returned to Winnipeg putting the 20-year-old Charles in charge of the location and survey party until Silcox's return sometime during the winter.

In early summer 1914, before the survey party reached Port Nelson, Silcox sent Charles to Norway House on business. Charles and a young First Nations man with limited English paddled, poled and portaged up the Nelson River system to Norway House and then returned, a round trip of approximately 1,200 km!

In fall 1914, after the survey party completed the route to Port Nelson, it started its journey back to Winnipeg. The first 300 km was by canoe up the Nelson River to where they accessed the rail line under construction. They then walked approximately 250 km along the cleared and partially constructed rail line towards The Pas and caught the train to Winnipeg.

Where the party transferred from canoe to the cleared rail line, there was a packet of mail for Port Nelson that Silcox felt had to be delivered before the winter. So, Charles and **Luke Clemons**, a seasoned Métis woodsman, canoed 300 km back down the Nelson River, delivered the mail to Port Nelson, then paddled, poled and portaged back up the river, arriving just before freeze-up, to where they started their 250-km walk towards The Pas. Charles reached Winnipeg in November 1914.

In Winnipeg, Charles was again employed by Silcox, assisting him in drafting the maps and profiles and preparing the final rail line location survey report. This was the first time Charles had lived in a Canadian city, but it wasn't for long. In early December, he was promoted to the position of supervising resident engineer, in charge of four other resident engineers to work under Silcox on the construction of the HBR during 1915. Charles' initial duties were to select camp sites, about 16 kilometres apart, for each resident engineer. Then, in conjunction with the contractor, supervise the transporting by horse teams and sleighs on winter tote roads, sufficient supplies to maintain each resident engineer's six-man party for a year. In mid-December, on his 22nd birthday, he left Winnipeg to return to northeastern Manitoba.

Before the 1915 spring break up, Charles and his Métis colleague and now friend, Clemons, constructed log caches at each of the five resident engineer's camps. Then Charles established his own camp, near present-day Gillam (KP 522). Only then did the engineering work for his 16-km section begin; laying out work for the contractor - clearing the right-of-way, grading, culverts and bridges. This work continued until the end of October 1915 when grading was completed, and final maps and profiles were prepared. Then Charles, with this crew, walked the 250 km of finished grade towards The Pas then took the train to The Pas and Winnipeg.

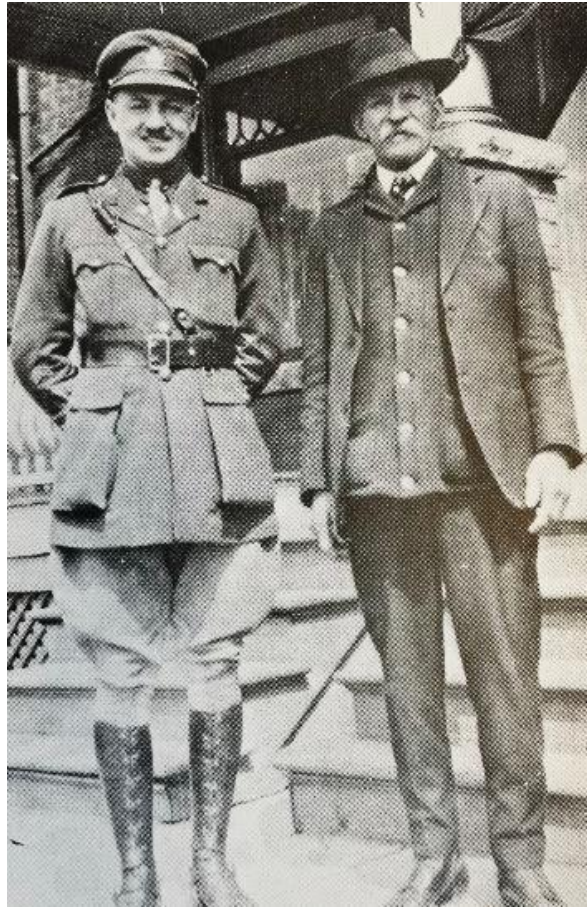


Charles surveying along HBR near KP 450, date unknown
(source Eira Friesen, via Engineers and Geoscientists Manitoba)

World War One

When he arrived in Winnipeg, Charles took a leave of absence from the HBR and signed on as a lieutenant with the Royal Winnipeg Rifles. After military training in the Winnipeg area, he sailed for Europe in September 1916, but not before marrying **Helena (Lena) Violet Hamilton** in May, whom he met in the fall of 1915. In his words she was “a wonderful warm loyal person; very beautiful too.”

Lena was able to travel to Britain during the war and gave birth to their first child, a daughter, **Eira Alice Charles**, in April 1917. Lena and Eira stayed in Britain while Charles served in France and Belgium. During the war, he was transferred to the Royal Canadian Engineers and the Canadian Railway Troops and was promoted to the rank of major. In that position, among other railway war-time projects, he was responsible for locating and constructing light, temporary rail lines used to transport military weapons and equipment to the front lines. For his valor, King George V presented Charles with the Distinguished Service Order in a ceremony at Buckingham Palace. After the war, he continued to be referred to as Major Charles throughout his life.



Charles in his WWI military uniform (left) with his father-in-law, March 1919
(source *Go Westward, Young Man*)

After World War One

In the spring of 1919, Charles and his young family returned to Winnipeg. On the day he returned to Winnipeg, and while still in military uniform, Charles was hired by CN as a transitman to finish a location survey of a branch line from southern Saskatchewan into Alberta. He boarded a train that evening and, still in uniform but now with all military insignia removed, he reported for work under the direction of his now mentor Silcox. When the survey was completed, Charles stayed on as a resident engineer in charge of construction of a 34-km section. He then returned to Winnipeg and was working in CN's office when his son, **John Hamilton Charles**, was born in December 1919.

For the next seven years, Charles worked in various capacities on nine railway projects in northern Ontario, in all three prairie provinces and in BC. On these projects, he worked as a resident construction engineer, an engineer in charge of surveying and location surveying, an assistant location engineer and, his coveted position, a location engineer. For a period in 1923-1924, Charles even worked as the terminal engineer at the Neebing Rail Yard in Fort William, Ontario, the rail yard on which he had just been the resident construction engineer. This rail yard was CN's first 'hump' (gravity sorting) rail yard in Canada and handled up to 2,000 rail cars per day shortly after it was completed.

Between 1919 and 1926, Lena and their children joined Charles for some of his longer projects or during the summer months. Depending upon the location and situation, their accommodations varied from a tent, to a barn, to billeting in a home to a log cabin that Charles built.

In 1921, even without formal engineering training, but because of his experience, Charles obtained his P.Eng. from the Association of Professional Engineers of Manitoba. (The organization was formed the previous year.) He later served as APEM's president in 1953 and became an honorary life member in 1973.

Also, during this period, Charles' mentor, Silcox, left CN and went to work on the location of rail lines in West Africa. In 1923, Silcox offered Charles a location engineer's position in Africa. Charles declined.

Completion of the Hudson Bay Railway

After Charles joined the army in 1915, work on the HBR continued until 1917. By then, rail had been laid to Kettle Rapids (KP 534), a steel bridge had been constructed across the Nelson River at those rapids, grade had been constructed beyond to Amery (KP 570) and the remainder of the proposed alignment to Port Nelson, which Charles surveyed in 1914, had been cleared. (This cleared alignment is still visible on Google Earth.)

Between 1915 and 1918, the HBR gradually became part of the Canadian Government Railways. Then, shortly after the war, CN was formed and assumed ownership of the HBR. Because of other CN priorities at that time, further construction of the HBR was put on hold. Over the years, most of what had been constructed, especially towards the northeastern end of the constructed rail line, deteriorated severely due to neglect. The resulted in wooden ties rotting, vegetation growing through the ballast and stretches of the subgrade sinking.

In 1926, the federal government decided to rehabilitate the existing rail line and to complete its construction to Hudson Bay. However, the government was now considering the mouth of the Churchill River as the terminus, rather than Port Nelson. Churchill was considered to have better potential as a deep-water port. (This after almost \$6.5 million - in 1917 dollars - had been spent between 1914 and 1917 on developing Port Nelson!)

At the beginning of 1927, Charles rejoined the HBR project as assistant to CN's premier location engineer **Murray Hill**. Their task was to make a preliminary location survey and report as to whether it would be feasible to build a railway across the Hudson Bay Lowlands, a vast area of muskeg between Nelson River and Churchill. Unfortunately, before starting their assignment, Hill took seriously ill and was hospitalized. Charles was asked to take over the preliminary survey, which he did during the winter months of early 1927.

Charles considered winter to be the more favourable season for surveying. Although winter days were very short and extremely cold, the ground was frozen making for easier travel. In non-winter months, survey parties were constantly wet up to the knees and often to the waist and plagued by mosquitos and blackflies.

Using dog teams and sleds, Charles and two Indigenous assistants surveyed from Amery (KP 570), essentially due north for approximately 250 km, to Churchill. Upon his return to Winnipeg, he reported that “there would be no unsurmountable difficulties to build a railway [to Churchill].”

Later in 1927, **Frederick Palmer**, an English civil engineer who specialized in port facilities, was retained by the Canadian government to visit and evaluate the port attributes of both Port Nelson and Churchill. Palmer recommended Churchill over Port Nelson. Therefore, even though the rail distance was approximately 120 km longer, Churchill was chosen as the terminus. This is why, at Amery, the HBR abruptly turns from its proposed northeasterly alignment and heads almost due north towards Churchill.



Modern-day map of HBR, The Pas to Churchill (source Wikimedia Commons). Red lettering and lines added. Dashed line shows approximate proposed alignment to Port Nelson. 'KP' indicates approximate 'kilometre post'

In spring and summer 1927, Charles returned to Saskatchewan and located one rail line and supervised construction of another. In August 1927, CN asked Charles to confirm his HBR feasibility survey findings from the previous winter. So, in September 1927, with an assistant and two Indigenous packers, he retraced on foot his 240-km winter survey after which he reported that nothing had changed his mind about the route that he had surveyed the previous winter.

As a result of his fall 1927 opinion, from October 1927 to April 1928, Charles was the engineer in charge of the final location survey of the HBR from Amery (KP 570) to Churchill (KP 820). He and his crew of approximately 25 men (many Indigenous) and 60 sled dogs worked and lived in tents for six months, much of it in sub-zero temperatures. In that relatively short time and under those conditions, they produced a complete alignment survey and set of

construction drawings for the 250 km from Amery to Churchill, as well as a survey of the mouth of the Churchill River. The survey party then walked, in four long days, the same distance back southward to Amery and boarded a work train to The Pas.

On Christmas Day, during that 1927-1928 survey, Charles was able to hear his wife and children's voices (a one-way conversation) during the first use of field radios by CN.

The HBR was completed to Churchill in March 1929 (the last approximate 100 km were constructed during the winter) and was opened for traffic in September 1929. Port facilities at the mouth of the Churchill River were completed in 1931. Charles, however, was not involved in any of this construction.



HBR looking northward towards Churchill, 1929
(source *Go Westward, Young Man*)

1928-1934

In April 1928, a week after he completed his final HBR alignment survey and construction drawings, Charles returned to Winnipeg and was immediately sent to northern Saskatchewan to supervise rail line construction. When construction was completed in late fall 1928, Charles and his family took a six-week vacation and returned to England to visit his family; his first extended vacation since 1912.

Before the Depression hit hard in early 1930, Charles was location engineer for two more branch lines, and supervised construction of three other branch lines, all in Saskatchewan. Between mid-1930 and 1934, he continued to work with CN. Although he had to take a reduction in salary, Charles was just glad to have a job. Because CN was not locating or constructing new rail lines during the Depression, Charles supervised completion of ongoing construction projects in southern Saskatchewan. Throughout the Depression, CN was loyal to him, and he remained loyal to CN.

HBR again: 1934-1938

In September 1934, Charles returned to the HBR and was based in The Pas. His first position was as a supervising engineer and then he became a district engineer. He worked under **J.G. MacLachlin** (also a major from WWI) whose priorities included bringing the drainage,

ballasting and bridging of the 820-km HBR up to the then current standards. Charles was delighted to get out of the southern Saskatchewan “dust bowl” (his words) and return to northern Manitoba with its clear flowing rivers, lakes and green foliage, and its abundance of game and fish.

Between 1934 and 1935, Charles built a log cabin at Atikameg Lake, approximately 30 km, by rail, east of The Pas. His family joined him there during the next few summers. In 1937, after both his children were in residence (Eira studying science at the University of Manitoba in Winnipeg and John at a private school, Pickering College in Newmarket, Ontario), Lena moved to Atikameg Lake for longer periods.

While work on the railway continued year-round, the focus changed between the winter months, when it was extremely cold, and the summer months when permafrost conditions had to be considered.

Although Charles first recognized permafrost (as it is now known) along the HBR just south of Kettle Rapids (KP 534) in 1915, it wasn't until his work with the HBR in the 1930s that he really appreciated permafrost's engineering significance. During this latter period, Charles considered the Wekusko Subdivision of the HBR (KP 0-218) as having no permafrost; the Thicket Subdivision (KP 218-522) as having discontinuous permafrost and the Herchmer Subdivision (KP 522-820) as having continuous permafrost. In his 1982 CGS interview, he recalled:

“...permafrost first occurs in the south, in the manner of small islands, as far south as Wabowden [KP 218]. Then it gradually gets thicker. ... And at Gillam [KP 522] it is not quite universal but, when you get north of there, you come into continual permafrost. There's no problem with that part of the [rail] line at all. Providing you leave the permafrost alone; don't interfere with it. However, in the intermediate area there is difficulty because, in my opinion, I don't think they're paying enough attention to drainage.”

Charles contributed a paper in the December 1959 issue of the *Proceedings of the ASCE, Soil Mechanics and Foundations Division*, titled “Permafrost Aspects of Hudson Bay Railroad.” The paper covered “Factors conducive to causing condition of permafrost; extent of this condition in Northern Canada and its effect on construction and maintenance; recommended practices to cope with problems permafrost presents, in particular, Hudson Bay Railroad.”

Between winter 1938 and summer 1939, Charles was seconded from the HBR for four short-term CN projects. The first two were location surveys for relatively short branch lines on Vancouver Island (neither were constructed). The third was working as the engineering advisor to two CN lawyers who were working with their CP Rail counterparts and the federal Board of Transport Commissioners on eliminating some of the duplicate rail lines in western Canada. The fourth was a location survey for a branch line from CN's mainline in northern Ontario to the proposed Steep Rock iron ore mine near Atikokan. On this project, Charles' 22-year-old daughter, Eira, worked for her father by freighting supplies and mail by motorized canoe to and from the surveying bush camp and filling in as camp cook when needed.

World War Two

In late August 1939, with the threat of war looming, Charles was approached in Winnipeg by the Royal Canadian Engineers to rejoin Canada's army. After getting a leave of absence from CN and one week before Canada declared war on Germany, Charles was sworn in, again as a major, to command the No. 1 Railway Company, with the hope of being amongst the first to depart overseas. He was 46-years old.

However, Charles did not go overseas. In late 1941, he became commanding officer of the 20th Field Company RCE and, after Japan entered the war in December 1941, Charles commanded that unit on the Pacific Coast. He was involved in some rail line location work, but his unit never saw action. In May 1942, Charles was seconded to the US Army to locate a proposed, 2,250-km military rail line between Prince George in northern BC and the US forces bases near Fairbanks, AK. He was given four and a half months to complete this Herculean task and submit his location survey and report. With the help of Canadian army and CN engineering personnel, and a dedicated float plane, he succeeded. The line was never constructed.

Later Career

In 1945, after the war, Charles was appointed Chief Engineer of CN's Western Region and became responsible for all CN rail lines from Thunder Bay to the west coast, both to Vancouver and Prince Rupert. Charles recalled that in 1957, when he was approaching the age of 65, **Donald Gordon**, then CN President, asked him to stay on longer with CN as a consultant. So, he continued working with CN for another eight years, until he was 73.



Major John Leslie (Les) Charles, date unknown
(source Manitoba Historical Society)

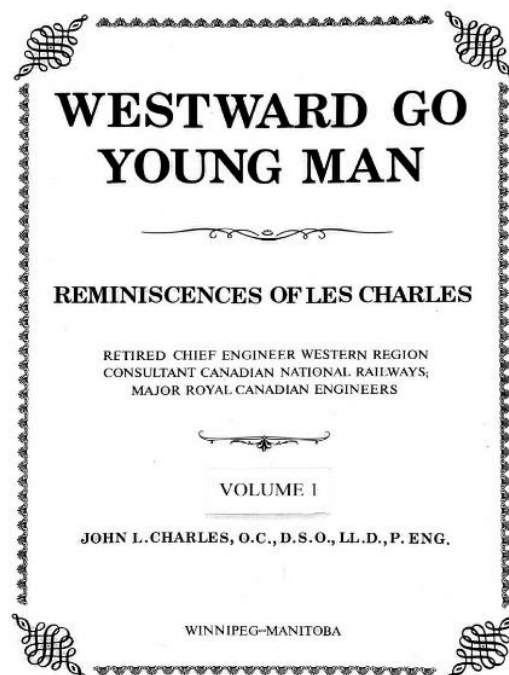
During those years, Charles was involved in evaluating the feasibility of a rail line from Takla Landing, in northern BC, through the Yukon to Fairbanks, Alaska. It is likely a portion of this route followed Charles' wartime 2,250-km route location. It was never constructed. He mentioned this proposed rail line in a January 1961 article, "Railways March Northward," in the *Canadian Geographical Journal*.

In those eight years, Charles was also involved in the location and construction of the 700-km Great Slave Lake Railway from Grimshaw, in northern Alberta, to Hay River and then on to Pine Point, in the Northwest Territories. It was completed in 1964. He documented the engineering aspects of this railway, still the only rail line in the Northwest Territories, in a May 1965 article in the Engineering Institute of Canada's *Engineering Journal*.

Charles also carried out feasibility studies for three other northern Canadian rail lines: one into central Yukon to serve the mining industry, another across the "Barrens" of the Northwest Territories to Coppermine (now Kugluktuk, Nunavut), and another down the Mackenzie River and along the Yukon and Alaskan coastlines to Prudhoe Bay, AK. None of these were constructed.

In 1965, after retiring from CN, Charles carried out a location survey for a 1,900-km rail line from a mine site in Zambia, Africa, to a port facility on the Indian Ocean in Tanzania. In 1974-1975 he evaluated a 950 -km rail line through the Amazon basin in Brazil. He celebrated his 82nd birthday during this latter project.

In the mid-1970s, Charles wrote a memoir, "purely a personal thing," (his words) about his life and career, which included many of his historical photos. In 1978, with financial help from CANAC Consultants (the consulting arm of CN at the time), a few copies of this two-volume, 500+ page memoir, *Westward Go Young Man*, were printed.



Title page from Volume 1 of *Westward Go Young Man*

Later Years

In the mid-1970s, Charles was featured in a 1976, 22-minute, documentary, “On to the Bay”, on the location and construction of the HBR. It was produced by the Queen’s University-based Canadian Institute of Guided Ground Transport. He was featured in the documentary visiting locations along the railway and recalling what it was like surveying, constructing and working on the railway in the early 1900s. (See <https://digital.library.queensu.ca/bay>.)

Charles’ wife Lena, who was two years older than Charles, died in 1973 at the age of 83. After Charles retired for the final time, he moved in with his daughter and her family in Winnipeg. For several years thereafter, he adopted an annual pattern of travelling for six months of the year. He would purchase an “around-the-world” airline ticket and zigzag in one direction, literally around the world with no set itinerary. He would spend enough time in each place to get to know it a bit, and then move on. Scotland, Switzerland, Australia and islands in the Indian and Pacific oceans were his popular destinations. He told a grandson that he was “looking for the best Pacific island.” He also travelled to more exotic places such as Kashmir in northern India, the Khyber Pass between Pakistan and Afghanistan, and the jungles of Papua New Guinea to find a tribe of “head shrinkers.” He also canoed a portion of the Zambezi River in southeastern Africa. In 1982, when Charles was 89, he started to take less adventuresome and demanding trips, such as to Hawaii.

In the late 1970s and early 1980s, Charles made several summer train trips to western Canada to visit rail lines he had surveyed, constructed and/or was associated with during his career. During his 1983 junket, when he was 90, Charles took the opportunity to go up in a glider.



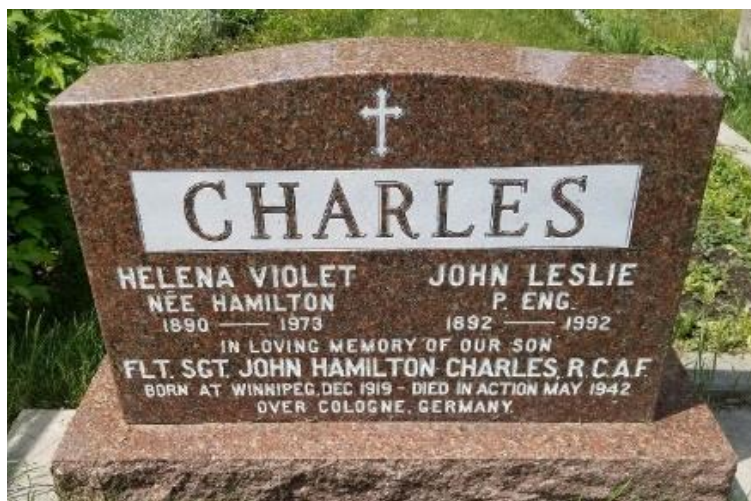
1981 photo of Charles (left) revisiting a 1911 GTP engineers’ cabin on Moose Lake, along the CN main line in upper Fraser River valley, BC. The cabin was found derelict in 1977, then leased and rehabilitated by CN engineer Ron Bailey (with back to camera) and his wife (left). The identity of the other woman is unknown. (source Grant Bailey)

In retirement, when he was in Winnipeg, Charles would regularly take the bus downtown to go swimming at the YMCA or attend a bi-monthly meeting with his “old buggers club.” These bi-monthly meeting ended when he became the last living “old bugger.” He also took great pleasure in spending time with his great grandchildren. Charles would also spend time, by himself, at this daughter’s family’s “shack” near Elma, about 100 km east of Winnipeg. At the shack, located along the Whitemouth River, he would often go canoeing.

In his last years, although in very good health, Charles became quite deaf. His eventual decline came after he fell and broke his pelvis. He never regained his mobility and eventually had to move to a care facility. He died on February 10, 1992, in his 100th year. His granddaughter relates, “I know it was not how he had wanted to meet his end. He had always packed a black suit on his travels in case he got ‘sent home in a box.’ I believe that would have been his preference. He was truly one of the last great adventurers of that era.”

Charles is buried in Winnipeg with his wife. Their son, John, died in action in 1942 during WWII. Their daughter, Eira (married name Friesen), died in 2008. She became a prominent community activist in Manitoba and was inducted as a Member of the Order of Canada in 2003.

Throughout his lifetime, Charles received many awards. In 1968, he received the Julian Smith Award from the Engineering Institute of Canada for “Achievement in the development of Canada.” In 1973, he was awarded an honorary doctorate by the University of Manitoba and was named an Officer of the Order of Canada “for a lifetime in railway development, administration and engineering.” He received a Queen Elizabeth II Silver Jubilee Medal in 1977. In 1981, Charles was awarded the Canadian Council of Professional Engineers’ (now Engineers Canada) Gold Medal, its highest honour, which “recognizes the exceptional achievements of engineers who, through their work and service, have improved the lives of Canadians and others across the world.” In 1987, at age 95, he received another honorary doctorate, this one from the Technical University of Nova Scotia (now part of Dalhousie University). In 2009, Charles entered, posthumously, into the Canadian Railway Hall of Fame in the category of “Leader.”



Charles' gravestone in the St. John's Anglican Cathedral Cemetery, Winnipeg
(source Holly P., <https://www.findagrave.com/cemetery/1980161/saint-john's-anglican-cathedral-cemetery>)

Concluding Remarks

It has been a challenge to briefly summarize the long life and career of railway engineer Major Charles. His 1978 memoir and his 1982 CGS interview are filled with amazing details and fascinating stories about rail line location and railway construction in the first three quarters of the 1900s. They also colourfully describe the many colleagues and characters he met along the way, and he freely shares his thoughts on the changes in railway engineering and the engineering profession that he experienced. Charles was a genuine optimistic and positive person and rarely had a negative thing to say about his colleagues, some of whom he worked with closely for months on end in very trying field conditions. And, importantly, he recognized and appreciated the support he received from, and the sacrifices made by, his wife and family so that he could live the life and have the career he did. (He dedicated his memoir to his wife.) Charles had a very strong work ethic and seemed to have thoroughly enjoyed what he did and all he accomplished. Charles was an extraordinary engineer and should certainly be considered one of Canada's exceptional railway engineers.

If you wish to learn more about Charles and railway engineering history in Canada, I suggest you dive into his memoir, *Westward Go Young Man*, which is on the same CGS web page as this article.

Acknowledgements

Thanks to the authors of recent *Canadian Geotechnique* articles for reminding me about Major Charles. **Mario Ruel**, former CN System Senior Manager Geotechnical Engineering and a past President of the CGS (2019-2020) and **Nigel Peters**, former CN Chief Engineer, helped me locate a copy of *Westward Go Young Man* in North Bay belonging to **Grant Bailey**, son of former CN Chief Engineer (Mountain Region), **Ron Bailey**. Mario, Nigel, Grant and **Stephen Harms** (CGS Heritage Committee) also reviewed and suggested many improvements to this article. The information on Charles' last years was provided by his grandchildren, **John**, **Bruce** and **Gordon Friesen** and **Leslie Pinchin**, and by **Geoff Buck** (retired Thurber Engineering engineer). **Heinrich Heinz**, Chair of the CGS Heritage Committee and **Valérie Fréchette**, *Canadian Geotechnique* Heritage Editor provided encouragement and guidance in my research the preparation of this article. A special thank you to **Craig McInnes** who improved my written words.

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Doug VanDine (dfvandine@gmail.com) is a retired geological and geotechnical engineer who now spends his time playing music and researching historical aspects of Canadian geotechnique. Doug is a past president of the CGS (2015-2016) and a past editor of Canadian Geotechnique. He is a member of the CGS Heritage Committee. In 2020, he authored a biography of Robert Legget, for whom the CGS' most prestigious medal is named. In 2022, on the 50th anniversary of the CGS, Doug presented an invited lecture at GeoCalgary2022 on the history of the CGS.