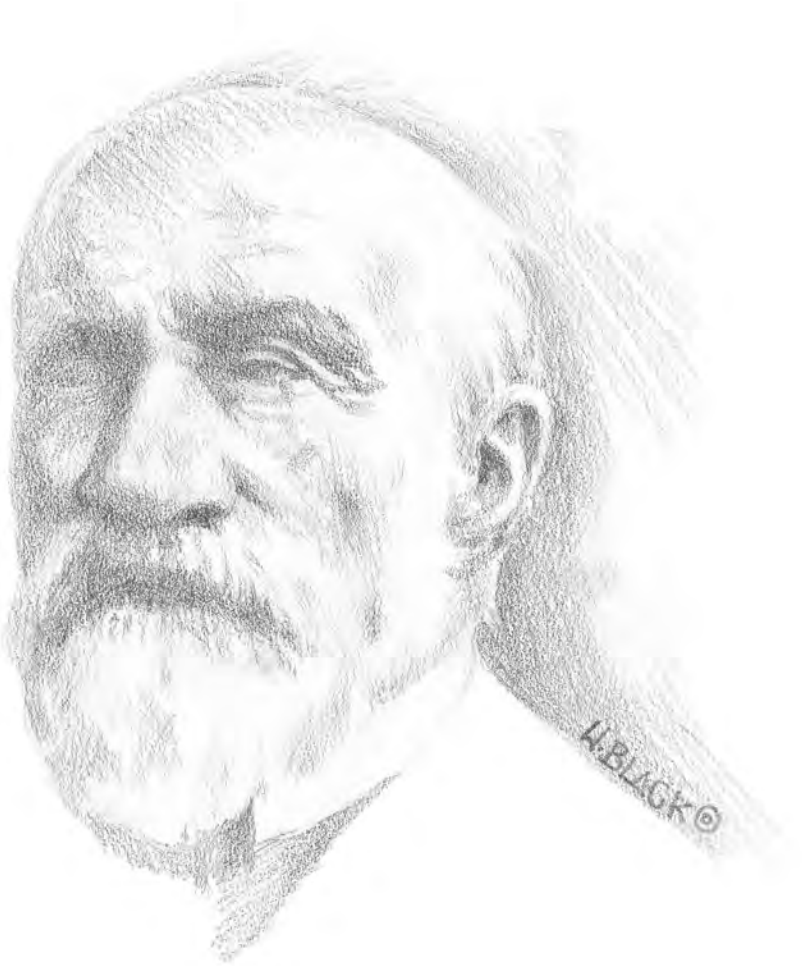
Sandford Fleming

Inventor: Transcontinental Railway, Standard Time System



In addition to extending the railway across Canada, Fleming also invented the notion of 24 standard time zones.

While most Canadians know more about American history than they do about Canadian history, there are some Canadian historical icons that most Canadians do recognize immediately. One of them is the photo of "the last spike" being driven in to complete the Canadian Pacific Railway in 1885. Everyone knows the photograph: Several dark-clad men in hats watch as a similarly clad, frail-looking man with a white beard drives home the last spike with a sledge-hammer. But few would be able to name any of the participants. A point-of-view historian once said the men in the last spike photograph were "a bunch of old guys in white beards." But they really were much more than that. They were some of the historical giants of their time — the people who built this country and set it on the road to greatness. The man driving home the spike was Donald Smith (later to become Lord Strathcona), president of the Canadian Pacific Railway. To his right was William Cornelius Van Horne, general manager of the railway. And directly behind him was Sandford Fleming, the chief surveyor and engineer of the railway.

A Scottish immigrant to Canada, Fleming contributed to the development of Canada in many ways. In addition to his contribution to building the national railway, Fleming also invented the notion of standardizing time around the world into 24 time zones.

Sandford Fleming was born in Kirkcaldy, Fifeshire, Scotland. He arrived in Canada when he was only 17 years old, with some training in surveying and engineering. He completed his education in Canada and set himself up as a land surveyor. One of his first jobs was to survey the Toronto harbour. He did most of the work himself, charting the harbour bottom from a rowboat in summer, and through the ice in winter. During this period, he also laid out townsites, cemeteries, and roads, and he designed schools and churches. He was eventually called on to do a survey for a railroad going from Toronto to Barrie on the Ontario, Simcoe and Huron Railway.

When he had first arrived in Canada in 1845, there were only about 25 kilometres of railway track in the whole country. When he was called on to do the Ontario, Simcoe and Huron Line survey, there wasn't a whole lot more! Fleming started his railway

work just at the beginning of the railway boom in Canada. And, only 35 years after Fleming's first railway survey, Canada saw a transcontinental railway completed.

Fleming eventually became the chief engineer for the Northern Railway. Firmly established as the leading railway surveyor in Canada, he was also asked to prepare a survey for the Intercolonial Railway that would connect what are today the provinces of Ontario, Quebec, New Brunswick, and Nova Scotia. He also became the chief engineer for the construction of the Intercolonial Railway and, while that was still in progress, he was asked to do the survey work for a railway in Newfoundland, which was a separate colony of Great Britain at that time.

In 1857, Fleming wrote a pamphlet titled "A Railway to the Pacific Through British Territory," outlining his own vision for the future. By then, the United States were developing their own national railways, and the Canadian government was becoming concerned about the British colonies in the west. After Confederation in 1867, Prime Minister John A. Macdonald, who was another Scottish immigrant, decided it was time to act. He hired Fleming to do a broad survey and feasibility study on how Canada should build its railway.

Fleming carried out his survey over a 17-month period. Enduring all kinds of weather along the way, Fleming travelled on horseback, by canoe, and on foot over barren prairies, through rugged mountain passes in the Rockies, and through virgin wilds in northern Ontario. In all his surveying work through what was largely wilderness, Fleming worked with his men in the field, taking the same risks and surviving the same hardships they did. Fleming himself was a big, strong, rugged man with an iron constitution, and he thrived in that sort of environment. However, 40 of his men lost their lives in completing this dangerous and formidable survey.

Fleming's preference was to take the railway line through the northern Yellowhead Pass because of its lower elevation and gentler slope. However, Donald Smith decided to take the line through Calgary; then through the Rogers, Kicking Horse, and Eagle Passes; and finally on to Vancouver and Burrard Inlet — even though there was no clear indication that this route was feasible, practical, or even usable all year round. But it was closer to the US border and would not only confirm Canada's claim on the territories, but would also provide easier access to American markets. The government said the railway was about nation-building, and W.C. Van Horne said it was about making

money for the private investors in the railway. They were both right, and the southern route best served both purposes.

Nonetheless, Fleming was astounded that they had ignored his recommendation for the route through the northern Yellowhead Pass. (Perhaps not surprisingly, Fleming's route was the route later taken by the Canadian National Railway.) However, Smith had sent another survey team, headed by Major A.B. Rogers, to look at the southern route. Rogers came back and said he had found the "secret" passage. One of the directors pointed out that Fleming had already mapped this route several years earlier, and it had been "documented and condemned … but this did not deter the indefatigable Major who proceeded to discover it again." (Cruise & Griffiths)

Van Horne was not impressed with Rogers' report, and he sent Fleming out once again to reconfirm the route through the Rogers Pass, which they eventually took for clearly expedient reasons. And in the end, with the driving of the "last spike," Fleming's dream of a railway across British North America became a reality.

But Fleming's significant role in building the Canadian Pacific Railway was not his only contribution to our modern world of transportation. In the course of his travels across long distances, made shorter by railways and steamships, it had become clear to Fleming's tidy mind that every town, every city, every region seemed to be operating on a different time clock. This was never a problem before, because no one travelled far enough or fast enough for a synchronized time system to be important. It was important now, and Fleming decided to do something about it.

In 1878, he attended a meeting in Dublin of the British Association for the Advancement of Science, at which he had expected to present his paper on Standard Time. But there was not enough time on the agenda for what his British colleagues, who lived in one time zone, thought was unimportant. And he was bumped off the agenda, along with his topic.

Undeterred, he spoke to his friend the Marquis of Lorne (who was not only the Governor General of Canada, but was also the son-in-law of Queen Victoria). The Marquis of Lorne had Fleming's topic bumped back on the agenda by sending copies of Fleming's paper to all the national governments of the world.

The Russian Czar Nicholas II responded and called for a world conference in Venice to discuss Fleming's idea. Fleming attended on behalf of Canada and outlined his

proposal that there be a "standard" time system in which there would be 24 successive time zones around the world. It was met with general approval, and a larger meeting was called for Washington, DC, in October 1884. The proposal was approved by 25 countries, and Standard Time came into effect on January 1, 1885, just in time for the opening of the Canadian Pacific Railway.

Not all countries adopted the new standard time system immediately. In 1885, it was still a world of competing empires, and some nations were miffed because "Greenwich time" meant the time in England was taken as the starting point. Eventually common sense prevailed, and almost every country employed this very logical system that had been proposed by this very logical man.

When the Canadian government was establishing a formal postal system with postage stamps as a fee for delivery, they asked Sandford Fleming to design the stamp. His design was the famous "three-penny beaver," and it was printed in red ink on a stamp similar to those in use today. Fleming believed that the beaver symbolized industriousness and the taming of the Canadian wilderness. This was the first of many times that the beaver would be used as a symbol of Canada. It was such an effective symbol that it was later adopted by the Canadian Pacific Railway in their corporate logo. Today, the beaver is still found on the reverse side of a Canadian five-cent piece (nickel). But it was Sandford Fleming who used it first.

He was an ardent nationalist … and an ardent royalist. It is said that in 1849, when the parliament buildings in Montreal were burning, Fleming dashed through the flames to save the portrait of Queen Victoria. That same portrait now hangs in the parliament buildings in Ottawa. Queen Victoria expressed her gratitude by knighting him in 1897.

Fleming was a charter member of the Royal Society of Canada and was the founder of the Canadian Institute. Appropriately for an ardent royalist, he was the Chancellor of Queen's University. In addition, he had a pocketful of honorary degrees from all over the world. It was said that Fleming, a man of broad interests and great energy, was equally at home in the wilderness or in the grand salons of Europe.