George Mercer Dawson: The "Little Giant" of Canadian Geology

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Abstract
George Mercer Dawson (b. 1849, d. 1901) was an influential Canadian Geologist well known for a variety of accomplishments. However, it is less known that he suffered from a variety of physical limitations. Tuberculosis of the spine (Pott's Disease) halted Dawson's growth at age 11, and left him with a severely twisted spinal cord and recurring headaches.
Rare for the time, he went on to build a prolific and highly influential career as a field geologist with the Geologic Survey of Canada (GSC).
Born in Nova Scotia, he moved to Montreal at a young age when his father became principal of McGill College (later McGill University). Dawson was schooled by private tutors in his youth (while recovering from his illness), then studied at the newly formed Royal Academy of Mines in London.
When he returned to Canada he began to work for the GSC. Between 1870 and 1900 Dawson mapped significant parts of Western Canada, discovered and reported a variety economic resources from gold to coal to oil, investigated plant and animal life, surveyed and advocated for local native populations, and cemented his place at the forefront of Canadian Geology. Dawson made major impacts in the fields of Geology, Geography, and Anthropology, and went on to become the director of the Geologic Survey of Canada in 1895 and the president of the Geologic Society of America in 1900. Dawson left a variety of autobiographical materials, which we will use to discuss his experiences as a field geologist and his perspective on his disabilities.

Childhood struggles
Dawson's love of the natural world was developed at an early age. Both his grandfather and his father were keen students of nature and science, and his father, Wallace Dawson, was a colleague of Charles Lyell. The two went on field excursions together when Lyell was in Canada.
He was born in Nova Scotia but moved to Montreal at an early age when his father became Principal of McGill College (later University).
In his 10th year he began to have headaches a result of Pott's Disease (tuberculosis of the spine).

"I do not remember when the first headache, the first of so many , seized me making it feel as though my head were turning to stone, thought by thought. I know now that it, and its later companions, were the result of the bending torque being applied to my spine as it weakened, as though I were being malformed by igneous intrusion."

The disease stunted his growth (he was less than 5 feet tall), twisted his spine, and left him suffering from frequent headaches.

Dawson (3rd from left) and a survey party in the field. Geological Survey of Canada / Library and Archives Canada / PA-051137

"And so began the years of the doctors. The trouble, as it were, was behind me, in my spine."

The headaches were triggered by excitement and stimulation. When his father brought him a fish, cut open to reveal multiple shells in its gullet, his fascination triggered another migraine. Yet it was that very interest that later assuaged the pain.

"Calm returned later, when the shells were added to a big wooden storage box Father brought back from Labrador, and I classified them over and over, first by colour, then by origin, then by size, and so on. "

During his long illness George was taught by private tutors in his home. During that time he longed for the outdoors, and made the most of his education.

"Sentence it was, for I became a creature of the indoors, no less than a convict [...]. I was determined... ... to make of my room at McGill a preparatory cocoon for my emergence as a moth, bent but capable of flight.

In his mid-teens, Dawson was taken to a new doctor in Maine.

"The first time I saw Dr. Buckminster Brown I recoiled, for I was viewing myself as I might one day be. "

"His diagnosis, after examination, was Pott's disease, a tubercular invasion of the spine which could be cured using a device he could guarantee would have effect, for he had evolved it both by and for himself. It was a bracing system capable of tightening by increments, and it was a horror that I choose not to mention again, but it had a singular virtue. It worked, and arrested the advance of the disease. "

With the disease halted Dawson was free to explore the outdoors again though not without reservations and the concern of others.

"The sea was my sandbox that Scottish summer, which was filled with energetic male cousins... who gave me no compassionate quarter, for which I was grateful, although no doubt Father had prepared them for meeting me. "

Though he was still recovering, Dawson resisted efforts to hold him back.

"Despite my return to health - apart from the occasional headaches, guaranteed now to disperse before sunset-Father remained overly solicitous, the more so because I was downriver and out of his sight. He insisted a hand carriage be found that could act as my second in the case of a sudden duel with fatigue. In my daily letter to Montreal from Cacouma I told him that, with regard to hand carriages, if he could locate one suitable for running up and down precipices and through woods full of spruce scrub it might also do well to carry water for my aquarium. "

Academics
The support and mentorship of his father's academic connections helped Dawson break through what might have been otherwise insurmountable barriers of prejudice. These connections would be instrumental in opening doors to further his career, but his drive and skill are what helped to propel him through into academic and professional excellence. He was soon enrolled in the Royal School of Mines in London, taking courses from the likes of Thomas Huxley.

"...Father had arranged through his old friend Professor Lyell that I should attend the Royal School of Mines. [...] Father knew that an education there would fit me for a future in a Canada where coal would be centre stage."

Dawson's drive and experience helped him to excel at the school, and in his second and third year he received several medals and scholarships for his academic successes including the Duke of Cornwall Scholarship, the Forbes Medal and Prize in natural history and palaeontology, and the Murchison Medal in Geology.

"I knew mental fear, but swore too that when I came back again to Montreal I would be taller in mind, as tall as any other man of science."

Career
Dawson overcame his physical limitations to have an exemplary career as a geologist. He is widely regarded as one of the most important and influential geologists in Canada. For two years after returning to Canada, from 1873-1875, he worked for the international boundary commission as Chief naturalist and botanist. After 2 years with the commission he fulfilled his lifelong dream to work as a geologist for the Geologic Survey of Canada (GSC).

First Nations crew working for George Dawson, Francis Lake, Yukon, 1887 Photo George Dawson

Dawson spent 16 years in the field for the GSC, during that time he mapped huge swaths of Western Canada, being influential in the mapping of large parts of BC, the Yukon and Alberta (1). Among his accomplishments: He influenced decisions on the route of the Canadian Pacific Railway ; Mapped major mountains and passes in the Canadian Rockies , Surveyed the Alaska border at the Yukon River and spurred gold discoveries .

He was also influential in ethnography. He visited Haida Gwaii in 1878 and after this trip warned politicians that the Haida had "fully developed" concepts of property and ownership and that they would need compensation in negotiations over land claims. He also had an interest in languages, learned several native dialects, and created a glossary of dialects spoken in British Columbia.

Dawson's obvious skills and talents were not overlooked by his peers. He was made a charter member of the Royal Society of Canada in 1882 and member of the Royal Society of London in 1891. That year he was also awarded the Bigsby Medal of the Geologic Society of London.

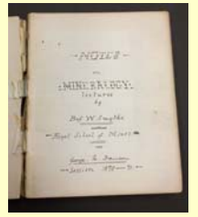
Dawson became the Director of the GSC in 1895. The position took him away from his beloved fieldwork, but he knew the job was important and persevered.

"To achieve what one has long wished for is, in my limited experience, both a blessing and a curse."

"The job quickly manifested itself as an ever-moving train of rather tedious details linked together by my sole authority to handle them. The desktop became my restricted field, and my hands its reluctant explorer."
As director Dawson's challenge was to improve the morale of the Survey staff and the public image of the institution. He hoped to shift the Survey from the broad strokes of reconnaissance mapping to a finer scale systematic mapping, but was often driven towards the former, including increasing surveys into the North and Labrador. However in his tenure he managed to set new standards for surveys and fieldwork at the GSC, an accomplishment for which he was later revered.
Honours poured in for the rest of Dawson's life, but one position that deserves special mention is the presidency of the Geological Society of America in 1900.

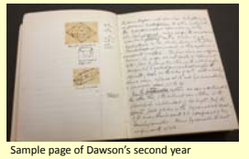
Dawson passed away suddenly in 1901 after a bout with bronchitis.

My life is short, the threads of life
A tangled skein, I cannot sort
But count it gain to live
To live and die-to see and know
And pass to the unknown
If I might live anew and plan
Throughout, and shape again
So far as men may do
The web of life-would I
Or would I not pursue
The self-same scheme?
-George Mercer Dawson



Title page of Dawson's second year mineralogy notebook

Bust of George Dawson in the UBC Museum



Sample page of Dawson's second year mineralogy notebook

At the University of British Columbia, the student club is called the Dawson club in his honour.
Recently a notebook from Dawson's second year mineralogy course was discovered in the UBC EOAS Museum archives. In 1932, the book was gifted to the Dawson club from the archives at McGill University, which holds a great amount of Dawson's personal effects.

References
(1) George Mercer Dawson with Phil Jenkins. *Beneath My Feet: The Memoirs of George Mercer Dawson*. Toronto: Random House, 2009.
(2) Zeller, S. and Avrith-Wakeam, G. "George Mercer Dawson ." *Dictionary of Canadian Biography* http://www.biographi.ca/en/bio.php?BioId=40789 (accessed Oct 15 2013).