



Dawson's interest in natural history began early. Cephalopods were readily available in his coastal village.

Rock Stars

INTRODUCTION

Bernard of Chartres, an 11th–12th century philosopher and teacher, said that we are like dwarfs on the shoulders of giants, so that we can see more than they and for a greater distance, not by any virtue of our own but because we are carried high and raised aloft by their stature.

All of us have our geological heroes, those giants on whose shoulders we stand. To encourage recognition of these luminaries and to provide inspiration for students and young professionals, the GSA History of Geology Division presents *Rock Stars*, brief profiles of our geological giants. If you have any comments on profiles, please contact Robert N. Ginsburg, University of Miami, RSMAS/MGG, 4600 Rickenbacker Causeway, Miami, FL 33149-1098, e-mail: rginsburg@rsmas.miami.edu.

—Robert N. Ginsburg, *History of Geology Division*

John William (Sir William) Dawson: Geologist and Educator

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INTRODUCTION

During the early 1970s, staff and patrons at the McGill University Archives were abuzz about a huge new bequest: the papers of John William Dawson. Dawson had been called from the tiny maritime village of Pictou, Nova Scotia, in 1855 to serve as McGill's principal. He presided over the university for nearly half a century.

Dawson was not only the major scientific player in 19th-century Canada, but he also commanded a leading position internationally. Dawson is one of those individuals whose diverse activities defy neat categorization. He was as much a paleontologist as a geologist, an administrator as well as an educator, and a popular writer on scientific and religious topics as well as the author of about 200 papers.

EARLY YEARS

John William Dawson, who always preferred to be addressed as "William," was born October 13, 1820, in the seaside town of Pictou, Nova Scotia. He was the elder of two sons of Scottish immigrants.

More History

The GSA History of Geology Division will sponsor Symposium 14, Hutton, Lyell, Logan—and their Influence in North America, at the 1998 GSA Annual Meeting in Toronto. The symposium is scheduled for Monday afternoon, October 26. Susan Sheets-Pyenson was scheduled to speak in that session.

For the first 30 years of his life, his parents were preoccupied with repaying debts incurred in maritime trade, a responsibility that they steadfastly discharged. Perhaps Dawson's intense earnestness and self-reliance were honed in this environment. Frugality was as important as piety in the Dawson household, giving William an inescapable and omnipresent seriousness of purpose.

Whatever young William lacked in material wealth during his formative years was overshadowed by his parents' deep affection and by the rich resources of Pictou. An academy in the town provided Dawson and other youths with a remarkable grounding in a range of subjects, especially in the natural sciences. Pictou Academy had been established in 1817 by the secessionist Presbyterian minister Thomas McCulloch as a school for training dissenting ministers and for teaching the liberal arts to youths of all religious persuasions. The academy housed an extensive collection of scientific apparatus, a small natural history museum, and a library with a remarkable assortment of treatises in natural philosophy and natural history.

Pictou was surrounded by sandstone and shale formations, which contained Carboniferous plant fossils. These provided fertile ground for Dawson's first scientific explorations, and allowed him to put together a respectable collection of geological and paleontological specimens. At age 16, Dawson delivered a paper on "The Structure and History of the Earth" to the Pictou Literary and Scientific Society.

HIGHER EDUCATION

In 1840, at the age of 20, Dawson matriculated at the University of Edinburgh in Scotland. Edinburgh was one of the few universities in the English-speaking world that offered a systematic natural history curriculum. There, Dawson learned geology, physical geography, and mineralogy from Robert Jameson; botany from John Hutton Balfour; and chemistry from William Gregory. Although Dawson remained fiercely proud of his birthplace and sensitive to any charges of hailing from the "backwoods," Nova Scotia must have seemed impoverished compared to the rich tapestry of life in Edinburgh.

Financial difficulties took him back to Pictou to help with the family bookselling business, but in 1841 he returned to Edinburgh to continue his studies and court his future wife, Margaret Ann Young Mercer, a distant cousin and daughter of a lace merchant. On the transatlantic voyage, Dawson met William Logan, who was about to become director of the Geological Survey of Canada. A few years later, Dawson guided Logan on a geological tour of the countryside, as he did Charles Lyell, showing both distinguished geologists the coalfields near Pictou, the cliffs of the Shubenacadie River, deposits at the Bay of Fundy, and the shores of the Minas Basin. Dawson maintained a cordial relationship with Logan, but he became the life-long protégé, confidant, and disciple of Lyell. Lyell assisted in publishing Dawson's work on the geology and paleontology of Nova Scotia, New Brunswick, and Prince Edward Island with the Geological Society of London.

STARTING A CAREER

Upon his return to Nova Scotia in 1847, after the completion of a second academic session at the University of Edinburgh, Dawson sought to enlarge the sphere of his interests beyond the bookselling business. He was hired by the General Mining Association of London to conduct a geological survey of Cape Breton, and he investigated coal and other mineral deposits for the provincial government and for small mining companies.

Dawson also turned his talents to educational matters. He lectured on natural history to the Pictou Academy, the Halifax Mechanics' Institute, and Dalhousie College. From 1850 to 1853, he traveled the length and breadth of Nova Scotia as its first superintendent of education. His devotion to the task was so complete that he is credited with single-handedly reforming the public-education system of the province. At the same time, he managed to continue his scientific investigations on the side, leading to some of his most important paleontological discoveries. These include unearthing a fragment of a skeleton of the earliest North American Carboniferous reptile or batracian (*Dendropteron acadianum*), the oldest land snail (*Pupa vetusta*), and the oldest millipede (*Xylobius sigillariae*), and to the first report of Devonian plants.

Dawson's investigations into the geology and mineral deposits of Nova Scotia provided data for his magnum opus, *Acadian Geology*, in 1855 (2nd ed., 1868; 3rd ed., 1880; 4th ed., 1891). This work, the most complete treatment of the geology of the maritime provinces, was but slightly modified by the findings of the Geological Survey years later. *Acadian Geology* made Dawson's reputation as a geologist of the first rank.

LATER GEOLOGIC STUDIES

Despite the extraordinary demands on Dawson's time from his administrative responsibilities, his unstinting field work, first in Nova Scotia and later in Quebec, increased the number of post-Pliocene fossils known in Canada from about 30 to more than 200. He often suggested to his scientific adversaries that they leave their armchairs and cabinets and observe specimens in situ. He helped to perfect the examination of thin fossil



Pictou, Nova Scotia, ca. 1845, as sketched by William Dawson.

slices using a microscope, a technique that allowed him to describe 125 new species of Paleozoic plants. His own collection of Canadian rocks and fossils formed the nucleus of the holdings of the Peter Redpath Museum, which in 1882 was donated to McGill in Dawson's honor.

Dawson's scientific reputation rests upon his work in paleobotany. He investigated Canadian formations stretching from the maritimes to the west (culminating in his *Geological History of Plants*, 1888), and he published several papers on the subject every year. Dawson has been called the grandfather of Paleozoic paleobotany in North America. His scientific legacy also includes pioneering work in Canadian geology, particularly for the eastern provinces and the St. Lawrence River valley.

CONTROVERSIES

Despite Dawson's claim to follow "a quiet middle course" in his scientific work, he loved to plunge into the heat of scientific controversy. He attracted both vehement critics and adoring acolytes for his outspoken denunciation of Darwinian evolution. He had discovered and named the puzzling *Eozoön canadense* in 1864, a fragment that appeared to be a foraminifer. For the rest of his life, he argued that the specimen proved the presence of animal life in the Laurentian rocks. Controversy continued for decades, despite mounting evidence of inorganic composition for this pseudofossil.

His contributions to paleozoology also invited debate, as they treated a vari-

ety of organisms, ranging from the lowest forms of life to prehistoric man (in *Fossil Men*, 1880). Finally, his work on Devonian plants, featured in his controversial Bakerian lecture to the Royal Society of London in 1870, never won universal respect by his contemporaries. Three-quarters of a century later, discovery of plant remains in the Rhynie Chest of Scotland supported his great discovery.

REWARDS

Dawson accumulated many scientific honors and awards. He became a fellow of the Geological Society of London in 1854, and of the Royal Society of London in 1862. He successfully lobbied for the formation of a national scientific organization, thereby leading to the creation of the Royal Society of Canada in 1882, for which he served as the first president. He brought both the American and British Association for the Advancement of Science to meet in Montreal. His firm guidance was felt in the affairs of the Geological Survey of Canada and in those of myriad scientific societies, especially the Natural History Society of Montreal. He presided over the American Association for the Advancement of Science meeting at Montreal in 1882 and over the British association's meeting in Birmingham, England, in 1886. He was knighted in 1884, becoming Sir William Dawson. In 1893, he became the fifth president of the Geological Society of America. His eldest son, George Mercer Dawson, became Canada's leading field geologist and director of the Geological Survey of Canada; he also served as 12th president of the Geological Society of America.

FOR FURTHER READING

Susan Sheets-Pyenson, *John William Dawson: Faith, Hope, and Science*, Montreal and Kingston, McGill-Queen's University Press, 1996. A "Note on Sources" discusses primary and secondary sources on Dawson. ■



Here in his late 30s, Dawson had already published *Acadian Geology*.