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## Four Essays On the History Of Science In Atlantic Canada

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The word “science” suggests, among other things, precision, clarity, certainty. Yet, paradoxically, the word itself is decidedly ambiguous. Depending on context it can mean a general body of knowledge, a specific subdivision of that body, a philosophical outlook, a mode of thought, a code of procedure, a profession as an entity, or the membership of that profession. It can refer to an element in education, in politics, in social organization, in the military, or in the economy. And in the context of a geographical region it can embrace all those senses.

SO WROTE THE AMERICAN HISTORIAN R.V. BRUCE in 1990, opening a book titled *Science and Society in the Maritimes Prior to 1914*. Bruce went on to compare the development of science in the Maritime Provinces with that in the USA, and New England in particular, noting that links between the New England States and Canadian Maritime Provinces were stronger than with Europe or Britain, but also the growing influence of European science in the United States which was then passed on to some degree to the Maritime Provinces. The great American western frontier dominated through natural history and geology in the growing United States, whereas in Canada, applied sciences, what Suzanne Zeller has called “inventory sciences,” supported the utilitarian interests of the colonizers and their governments. The United States could boast several cities with important scientific cultures, whereas in Eastern Canada the critical mass (my words, not Bruce’s) of populous cities with scientific cultures could not be achieved—as he said, “Science then as now ... needed cities.” And whereas in the United States life scientists dominated the sciences, in Canada geology and agriculture took center stage. Scientific controversies, none greater than the response to Darwinism, appear to have been resolved more easily in the scientifically-literate parts of the United States than in Canada. Finally, Bruce notes that a large proportion of American scientists in the nineteenth century supported themselves by teaching, followed by those employed in government, whereas in the Maritime Provinces government science dominated, largely in agriculture, and increasingly in geology. To this one should add that in much of Canada until well within the last three decades of the nineteenth century most of the “scientific” work appearing in print was by educated amateurs from the professions, business, or the military.

Regionally-focussed synoptic studies of the history of science in Canada are few and far between, and perhaps are not only unfashionable but may be misconceived in terms of recent concentration on the social history of science. The example of the admirable *Histoire des Sciences au Québec*, first published in 1987 and expanded in 2008, suggests otherwise, as does the success of symposia on the environmental history of the Atlantic Provinces. They are

matched for most of Canada only by Zeller's more expansive *Inventing Canada* (1987), concentrating on the roles of science in nineteenth-century British North America. All of these provide a feast of information, examples, and ideas for an expanded historiography of Canadian science. Newfoundland—to expand the eastern provinces from Maritimes to Atlantic Provinces—enters the canon of history of science in Canada primarily through the unfulfilled promise of Steele's intriguing and tantalizing *Early Science in Newfoundland and Labrador* (1987), and by the chronological and historical development of society implied and described in George Rose's *Cod: the Ecological History of the North Atlantic Fisheries* (2007), which weaves Newfoundland society into the history of Newfoundland's greatest resource. Historians and histories of Newfoundland have, in general, avoided any mention of science in the past of the island, including Sean Cadigan's environmentally-aware *Newfoundland and Labrador: a History* (2009).

Examining very recent works on the history of science in the Atlantic Provinces reveals emphases on organizations, but primarily on people. Organizations and people come together intriguingly and comprehensively in Suzanne Zeller's mining of the archives of the Nova Scotian Institute of Science, founded in 1862, in which she documents how a mid-nineteenth century regional scientific society reflected its context and was forced to adapt as science and society changed around it. Richard Field has examined the remarkable life and ideas of the early nineteenth century surveyor, naturalist, and philosopher of environment Titus Smith, Jr. (1768-1850). Elizabeth Haigh's biography of the physician-geologist-entrepreneur Abraham Gesner (1797-1864), best known as the inventor of kerosene, shows the opportunities available in mid-nineteenth century to an ambitious polymath in the Maritime Provinces (as they became), also the impediments to success in a developing society before science had become institutionalized. For New Brunswick alone, Ronald Rees's biography of W.F. Ganong (1864-1941) gives an entrée into recent knowledge of the Natural History Society of New Brunswick and the work of a naturalist, physiographer, and social historian in the generation after Gesner.

This far from synoptic listing of recent works on the history of science in Atlantic Canada provides a little background for four new essays on science on the East Coast, ranging from the mid-nineteenth century well into the twentieth century. They begin with reactions to Darwinism in Nova Scotia among early members of the Nova Scotian Institute of Science. Andrew Reynolds, Christie MacNeil and Mitchell Jabalee in "The Reception of Darwinism in mid-to late Nineteenth-Century Nova Scotia" examine early addresses to the Institute, between 1864 and 1879, centering on the reception of Darwinism among members of the Nova Scotian Institute of Natural Sciences (as it was called until 1890). Only one speaker was a physician and not one was a scientist, but there was, typically, a considerable variety of opinion, mostly but not all contra Darwin, centering on compatibility between science and religion, and in the case of some speakers accepting modified versions of natural theology. In

a fascinating snippet from a brief summary of the discussion in the Sydney, NS, Mechanics Institute in January 1872, after a lecture on “Mind”, the authors document the tension between acceptance and rejection of Darwin’s “development hypothesis.”

Alexander H. MacKay (1848-1929) was Superintendent of Education for Nova Scotia from 1891 to 1926 and President of the Nova Scotian Institute of Science from 1899 to 1902. One would not expect him to be the subject of the CBC News in the 21st century, but such is the case. MacKay was the proponent of, and major actor, in a more than two-decade-long project to gather seasonal information on such phenomena as the dates of bird arrival, first flowering of several plants, and other seasonal signals, now collectively termed “phenology.” This has proved a gold mine for climate-change researchers. Sarah Spike, in “Mayflowers and Sleeping Johnnies: Nature-Study, Local Knowledge, and A. H. MacKay’s Phenological Research in Rural Nova Scotia, 1892-1925,” shows how this project, in the hands of MacKay and the “compilers” he chose to manage the data coming in from schools all over the province, was aimed (at least in part) at modernizing rural society, and that the data, far from being unbiased, were evaluated and edited in ways that modern users have not taken into account.

Googling “UFOs in the Middle Ages” brings a sobering and disconcerting medley of pseudoscience and historical information. During at least the past 1200 years, humans have reported Unidentified Flying Objects (UFOs) such as celestial arrows and spears, ships disgorging anchors and other-worldly sailors, knights in battle, flaming shields, dragons, globes, disks, and bloody suns, in their heavens. As Matthew Hayes and Noah Morrith describe in “Michael W. Burke-Gaffney and the UFO Debate in Atlantic Canada, 1947-1969,” the Reverend Dr. Michael Burke-Gaffney (1896-1979), a professional astronomer at St Mary’s University in Halifax, chose to use the modern UFO debates of the late 1940s through the 1960s as a means to educate the East Coast populace in astronomy and scientific method by emphasizing the unlikelihood of an extraterrestrial origin of UFOs and their susceptibility (eventually) to the systematic methods of science. He was convinced of what Hayes and Morrith call “the power and scope of scientific knowledge” to explain the temporarily inexplicable. Their essay shows the context and extent of Burke-Gaffney’s attempt, and how it eventually fell afoul of changes in society in the Maritimes and elsewhere.

Nearly surrounded by the North Atlantic Ocean and its adjacent seas, the Atlantic Provinces have paid coherent scientific attention to marine fisheries and other aspects of marine science since the 1890s. Historians have responded to this unity of purpose in a number of recent publications, the first of which, Jennifer Hubbard’s *A Science on the Scales* (2006) set a standard and the agenda for a good deal of subsequent research, including a symposium volume published in 2016 on the region’s most influential fixed biological station at St Andrews, NB. A magnificent resource — not strictly speaking a historical

work — is the 2014 volume *Voyage of Discovery* marking the 50th anniversary of the Bedford Institute of Oceanography (BIO) in 48 chapters covering all aspects of work based at BIO. This is a splendid source book for historical research on the marine sciences in Atlantic Canada. My paper “Too Late For Action.” A.G. Huntsman, M.L. Fernald and the Belle Isle Strait Expedition of 1923,” concluding this issue of *Scientia Canadensis*, is far less ambitious. It outlines the interesting byways that appear through close examination of little-known aspects of the early work of a seemingly well-known marine scientist like the influential A.G. Huntsman (1883-1972). My hypothesis that Huntsman in 1923, nominally establishing the factors governing the abundance of Atlantic Cod in Labrador and Newfoundland waters, was on the verge of an ecological concept similar to Evelyn Hutchinson’s ecological niche as a multi-dimensional hyperspace. This leap into semi-supported hypothesis will be, I hope, as stimulating as my colleagues’ contributions in the preceding three essays.

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