

Finding the International Appalachian Trail in the Atlantic Provinces, Canada: the Last Spike¹

John H. Calder

The Appalachian Mountains have a meaning to geologists that may not be as readily known by the public who hike the Appalachian Trail, or dream of doing so one day. To geologists, the Appalachians are inextricably tied to plate tectonics and the assembly of Pangea. The Atlantic Ocean intervening between North America, north Africa, and western Europe is an inconvenient distraction in reconstructing that world. But to those less fortunate than those who have studied Earth Science, the concept of retracing a world united by tectonic movement and later ripped asunder, to actually trace that connection on foot, is a revelation. It was the idea of visionary scientists in Maine, championed by their Governor, to extend the famed hiking trail northward from Mt. Katahdin to eastern Québec. In so doing, the trail became both a gesture of international goodwill and an exercise in geological education. Today, eighteen countries on both sides of the Atlantic as well as Greenland and Iceland have joined hands in the International Appalachian Trail. Tracing a route through the Maritime Provinces has posed challenges, due to the complex geological terranes and also to the lack of lengthy trail systems. The push to complete the Trans Canada Trail for Canada's 150th birth year is helping to bridge this gap, but its route in some cases avoids the ancient highlands more than guiding the hiker along them. This year, a route will be proposed, if not completed, that will connect the Appalachians in New Brunswick with western Newfoundland, and Pangea will be reunited, if only to intrepid through-hikers and geoscientists. The opportunity to engage the public along portions of this grand route however, has deep potential for learning and for exceptional outdoor experiences. Perhaps most of all, the completion of this idea to join hands comes at a time in human history when nations can afford to be inspired by the ancient ties that bind.

¹43rd Colloquium and Annual Meeting of the Atlantic Geoscience Society, Program with Abstracts; Atlantic Geology, v. 53, p. 135.

Recent Case Studies that Illustrate the Need to Identify, Value and Protect our Natural and Cultural Geoheritage in Atlantic Canada¹

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To some geoscientists who are trained to understand the significance of geology and Earth history, the formal recognition of geoheritage can seem unnecessary. But, as argued elsewhere, geoscientists cannot expect support for our work and of the value of geological resources if we do not make the effort to inform the public and government of their significance. Worldwide, the best approach to achieve these ends is through the recognition of our geoheritage. Since beginning the exercise of formally identifying geoheritage assets across Nova Scotia, several instances have occurred that underscore the importance of such an undertaking both to the geoscientific community and to the broader public. Some of these cases have had positive outcomes, at least one has not, and for yet another time will tell. These include: i) the aborted development of a large monument and infrastructure on the geoheritage site at Green Cove, Cape Breton Highlands National Park, after heated opposition; ii) demolition of the cultural geoheritage site at Crystal Cliffs by Saint Francis Xavier University, without public consultation; iii) the debasement by graffiti of the exceptional geological exposures at Cape Dauphin, Cape Breton, and adjacent Kluscap's Cave, highly sacred to the Mi'kmaq, which has not been brought to public attention until now; and iv) the relocation of the cairn at Moose River, commemorating the 1936 Moose River mine rescue, a case where the value of a site has been acknowledged by the mining company, although its relocation is not without debate in the community. These case studies indicate that ignorance and lack of public scrutiny can lead to negative outcomes (cases ii and iii), whereas shared knowledge and public awareness do not (cases i and iv). The formal recognition of geoheritage sites puts an onus on the geoscience community, private sector, public, and governments alike to value our natural and cultural geological heritage.

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The First Unambiguous Pterygote Ichnofossil from the Joggins Fossil Cliffs, UNESCO World Heritage Site, Joggins, Nova Scotia, Canada¹

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A discovery made in the Pennsylvanian-aged Springhill Mines Formation 1989 by Don Reid “The Keeper of the Cliffs” and his son, Doug Reid, at Dennis Point within the Joggins Fossil Cliffs UNESCO World Heritage Site, Nova Scotia, of a dragonfly-like paleodictyopterid (Megasecoptera) has been reinterpreted as the first unambiguous winged-invertebrate ichnofossil at the site. After its discovery, this fossil became the emblem for Don Reid’s Fossil Centre and remains on display at the new Joggins Fossil Centre.

The terrestrial invertebrate fossil record at Joggins is best represented by ichnofossils. Globally the pteralious invertebrate ichnofossil record is almost nonexistent with the exception of some landing traces that are represented by appendage impressions (i.e. *Tonganoxichnus* and *Rotterodichnium*). The specimen of interest here is the only known unambiguous example of a winged trace fossil that demonstrates the anatomical details of the trace maker and is the first definitive evidence of flying invertebrates at Joggins despite depictions dating back to writings by Sir William Dawson based on a putative compound insect eye preserved within a tetrapod coprolite. One additional carbonized wing fragment identified as Paleodictyopterid has since been found.

The trace fossil is here discussed and tentatively interpreted as the body impression (*Cubichnia*) of a winged invertebrate, righting itself after an inverted landing into soft sediment that may preserve a microbial surface. The fossil lacks carbonized remains, and shows no evidence of a compressed thorax, appendages or cephalon. The posteriorly shallowing dorsal impression has 4 deepwing impressions and a curved abdomen impression that exhibits drag impressions suggesting movement. The anteriorly deepening wing impression and abdomen drag is consistent with traces left by a modern dragonfly dislodging itself from wet sediment.

Don Reid’s contribution to our growing knowledge of the Joggins Fossil Cliffs spans nearly a century. If correct, the reinterpretation of this specimen as a trace fossil of Megasecoptera has implications for its taxonomic status, and it would be only fitting to name it in his honour.

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A Reliable Source of Seaborne Natural Gypsum for European, North American and South American Markets: Opportunities in Nova Scotia, Canada¹

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This presentation provides a high-level outline of the natural gypsum resources of Nova Scotia. It provides an overview of a quarrying operation that currently extracts natural gypsum and exports it from the Province and outlines the potential opportunities for re-starting operations that were recently placed on care-and-maintenance during the Great Recession. The presentation describes the current situation and looks at potential for developing Nova Scotia's natural gypsum client base.

¹Presented at the 1st Gypsum Supply Conference and Exhibition 2018, Brussels, Belgium, March 13, 2018.