

## Dr. John Rae – commemorated on an unusual scale

Famous men, and rather fewer women from past centuries, are commemorated in many ways in addition to their gravestones and traditional monuments of various kinds. The Millennium Edition of the Times Atlas of the World contains scores of entries for territorial units, towns, cities or natural features in different parts of the former British Empire which are named after Queen Victoria. Less prominent figures may, e.g., have a mountain named after them, e.g. President McKinley, though the mountain is now called Mt. Denali. The single entry for John Rae is for the Rae Strait which separates King William Island from the Boothia Peninsula NW of Hudson Bay. Other sources list Rae Lakes in the North West Territories, a group of small lakes roughly mid-way between Great Slave Lake and Great Bear Lake, and Rae River which flows into Coronation Gulf on the Arctic coast of Nunavut, N of Yellowknife.

John Rae joined the Hudson's Bay Company (the HBC) after completing his medical training in Edinburgh in 1833. The HBC had been established in 1670: the main focus of its activities in the earliest decades was occupation of the land around the innermost parts of Hudson Bay (with emphasis on the fur trade and exploration of the land area to the NW): a further goal was to find out if a Northwest Passage from the North Atlantic to the Pacific existed. Rae and one of his predecessors in the HBC, Samuel Hearne are credited in "The Canadian Encyclopedia" (see figure below) with exploration of the area W of Hudson Bay to the Great Slave Lake, the Great Bear Lake and N to the Arctic coast.



Source: <https://www.thecanadianencyclopedia.ca/en/article/exploration/>

One of Hearne's journeys, in 1771, followed the course of the Coppermine River from its source, close to the Great Slave Lake, to its mouth on the Arctic Coast: copper deposits in the lower reaches of the river contained native copper which was used by the local inhabitants who were known as the Copper Inuit. These copper deposits were the first of numerous types of mineral deposit, including large deposits of gold and diamond, to be discovered in what came to be defined as the Northwest Territories.

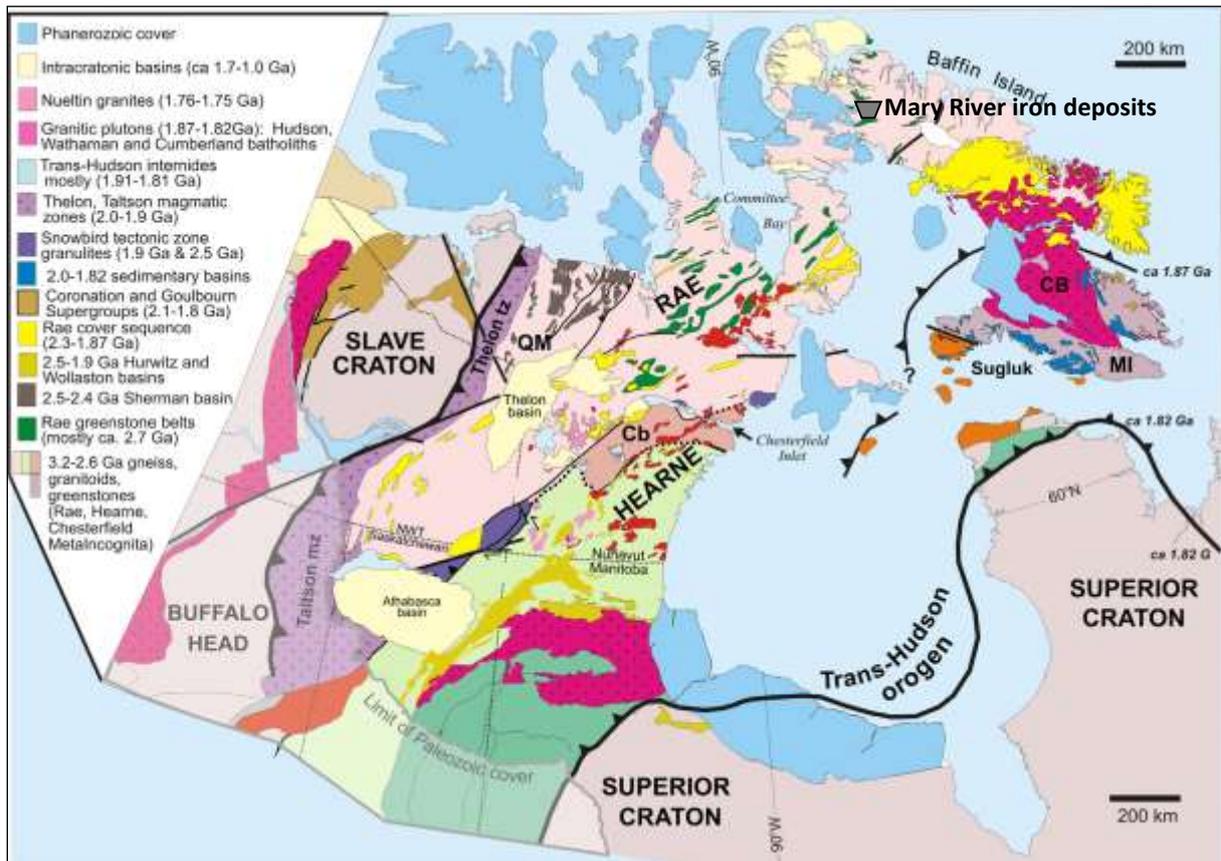
In the course of the 19<sup>th</sup> C it became clear that the large, relatively flat area occupying most of Canada between the Rocky Mountains and Labrador, later known as the Canadian Shield, contained

many large metal deposits. This was a key factor in the formation of Canada's oldest scientific organisation, the Geological Survey of Canada (GSC) in 1842, part of its mandate being to support development of the mining industry by systematic mapping of the geology of the country. The geological research carried out at GSC was supplemented, as devolution of many responsibilities to the provinces was implemented during the 20<sup>th</sup>C, by the establishment of provincial authorities with responsibility for documentation of mineral resources and the interests of the mining industry, and also by strong research groups in several of the universities in Canada.

Accurate geological maps and information on the rocks they show are among the main tools used by the mining industry in its exploration for mineral deposits and by other industries in connection with major tunnel projects or other underground installations. Such maps are normally produced at several levels of detail and are commonly accompanied by publications or databases describing the major geological units and the individual rock types. The rock formations in the Canadian Shield range in age from 4.2 to 2.5 billion years: they have been subject to several cycles of deformation, uplift and erosion. One of the main tasks of the geologists has been to define areas of rock, geological provinces, which have shared features which can be useful in defining the age and sequence of events which led to their formation.

One of the earliest publications defining the Rae and Hearne provinces (now described as "cratons") was published by GSC geologist Paul Hoffman in 1988. The map published by Sally Pehrsson and co-authors (in 2013) and shown below indicates that Hoffman's interpretation of the area NW of Hudson Bay has "stood the test of time!" The dramatic adjustment in Pehrsson's publication and that of St. Onge et al. (2009) is recognition of the fact that the Rae craton extends, not only from Lake Athabasca, close to the NWT – Saskatchewan boundary, north-eastwards to the Boothia Peninsula and across Baffin Island but also that it extends into the coastal regions of NW Greenland where it disappears under the inland icecap (a total distance of over 1,000 km). St. Onge et al. (2009) list the ages of the main components of the Rae craton in Eastern Canada as between 2,658 and 2,900 million years but also give an age of 3,030 million years for one of the components of the craton in its extension in Greenland.

*\*Craton: an old, stable part of the [continental lithosphere](#), in which the lithosphere consists of the Earth's two topmost layers, the [Crust](#) and the uppermost [Mantle](#).*



Simplified geology of part of the Canadian Shield (Pehrsson et al., 2013)

The northernmost part of the Rae craton in Canadian territory contains several large metal deposits - the Roche Bay iron deposit on the eastern coast of the Melville Peninsula (E of Committee Bay in the figure above), the Mary River group of iron ore deposits at 71°19' N on Baffin Island and the Nanisivik lead-zinc deposit on the north-western coast of Baffin Island. These deposits, despite their Arctic location, are sufficiently large to attract interest from commercial mining companies. The Mary River group includes nine deposits the largest of which is operated by Baffinland Iron Mines Corporation, with a planned annual production of 18 million tons. The current mining area has a documented tonnage of close to 1,000 million tons with a grade of close to 65% Fe (among the highest found in large deposits globally). Production is transported by road to Milne Inlet, almost due S of the mines where the first shipments were exported in 2015.

The creation of a mining industry is only one of the numerous developments in the territory in the eastern Arctic of Canada now called Nunavut which would have astonished John Rae, Samuel Hearne and the other pioneers who explored Arctic Canada in the 19<sup>th</sup> C, adding to knowledge of the country and inspiring many others to try to follow in their footsteps.

## SOURCES

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**Additional map figures (from St. Onge et al. 2009) for consideration**  
(and confirmation of the conclusions quoted in the text)

