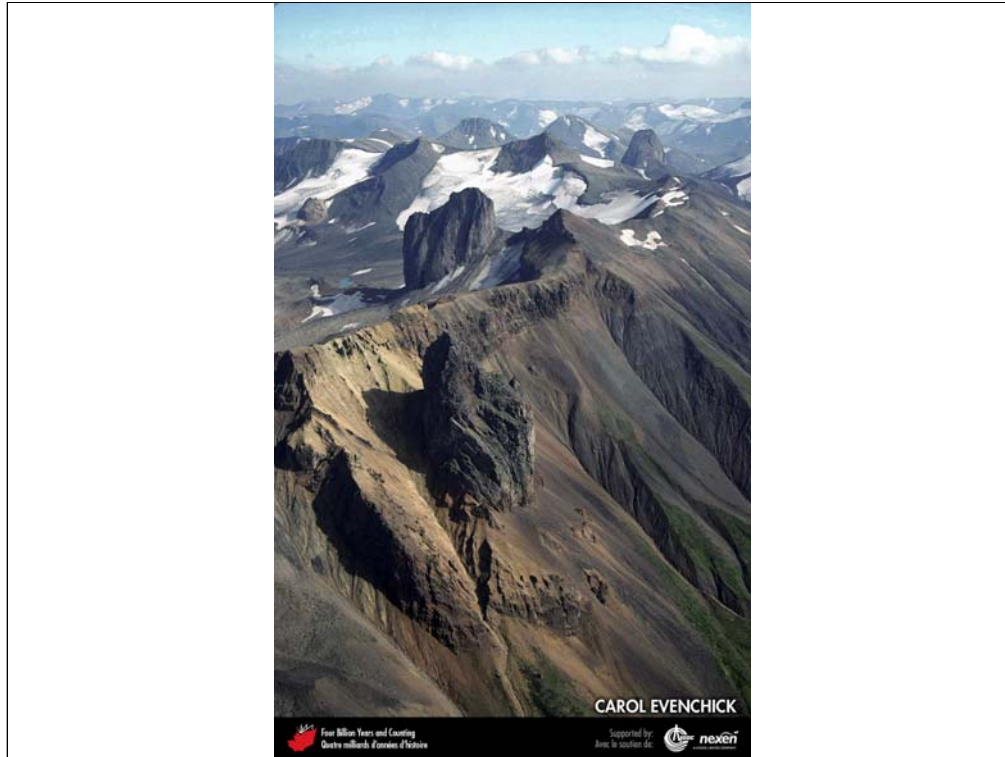


CHAPTER 5

Part 1 of 2

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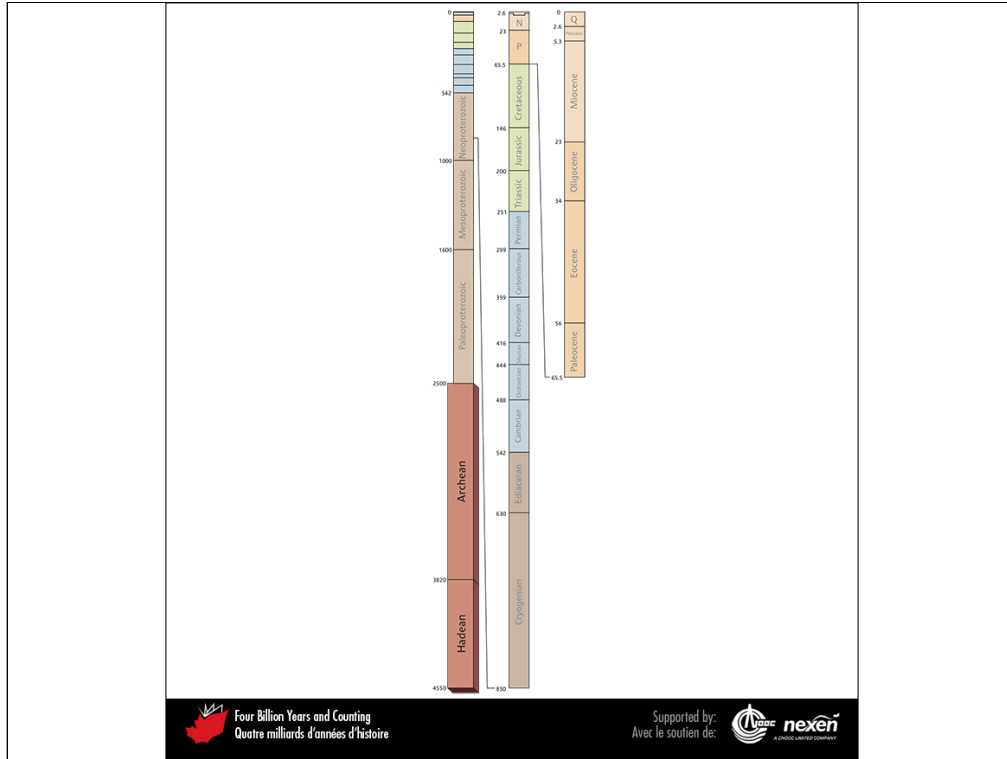
The steep-sided isolated peaks in this scene, at the head of Maitland Creek, Skeena Mountains, British Columbia, are Pliocene volcanic necks of the Stikine Volcanic Belt (Chapter 10). They were intruded into Jurassic sedimentary rocks. CAROL EVENCHICK.


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Convoluted Archean gneiss at Fords Harbour, near Nain, Labrador. This rock, part of what geologists call the North Atlantic Craton, formed under very high pressures and temperatures in the lower continental crust. BRUCE RYAN.

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Four Billion Years and Counting
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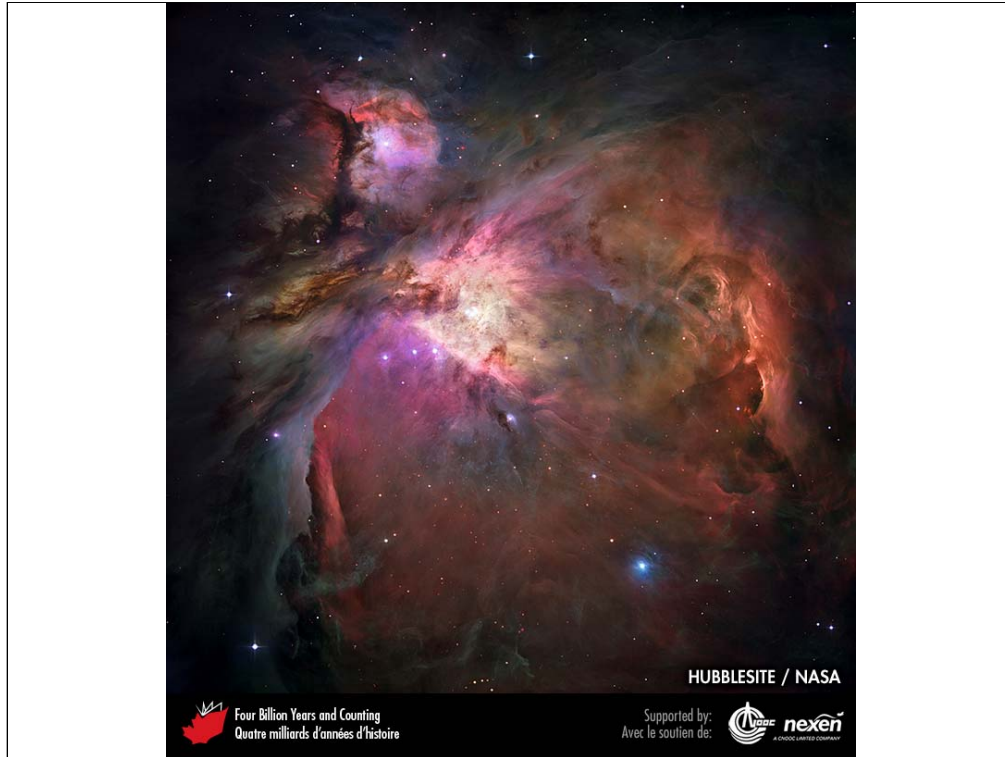
Geologic time scale, showing the interval covered in this chapter. Numbers indicate millions of years ago. P = Paleogene (Paleocene to Oligocene), N = Neogene (Miocene and Pliocene), and Q = Quaternary.

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A group of five galaxies known as Stephan's Quintet, viewed through the Hubble Space Telescope. Individual members of the Quintet are prominent, but many of the other "stars" in the background are in fact more distant galaxies. Galaxies are a result of the Big Bang, which occurred 14,000 to 13,500 million years ago. FROM THE HUBBLESITE, COURTESY OF NASA AND STSCI.

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The Orion Nebula, a nebula within our Milky Way Galaxy, as seen through the Hubble Space Telescope. Nebulae are accumulations of gas and dust that glow due to radiation from nearby stars, and are the nurseries for new solar systems. FROM THE HUBBLESITE, COURTESY OF NASA AND STSCI.

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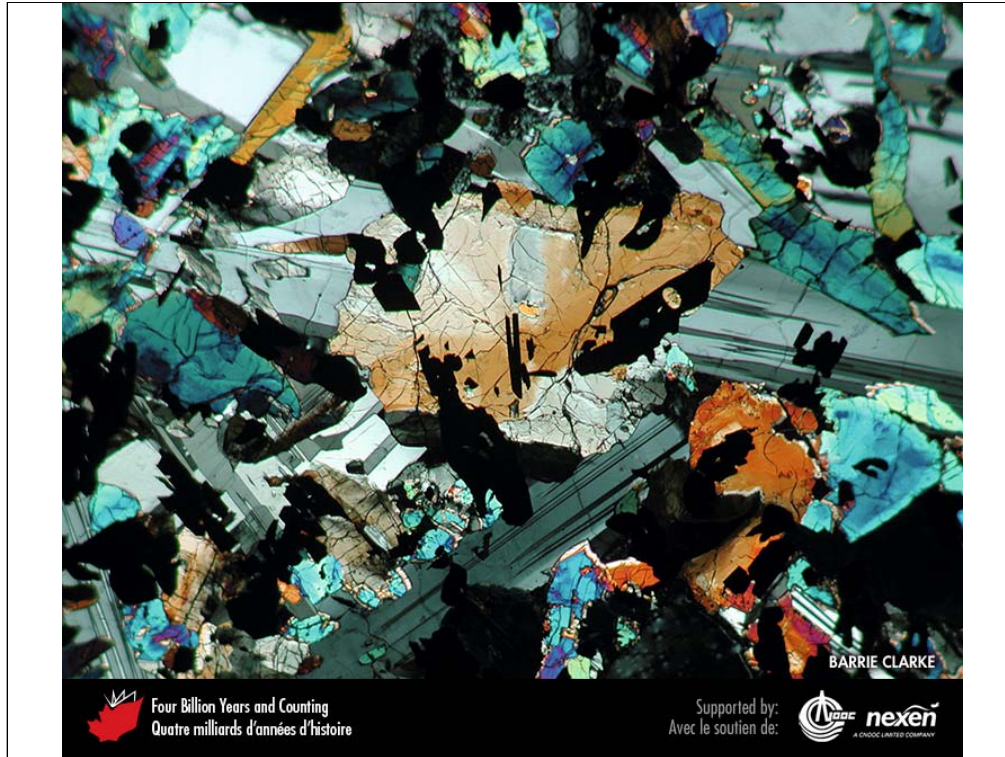
The largest intact meteorite ever found in Canada fell near Madoc, Ontario, perhaps in the early nineteenth century, and was discovered by William Logan in 1854. It is a single mass of iron weighing over 150 kilograms, twice the weight of an average adult person. ROB FENSOME, SPECIMEN COURTESY OF NATURAL RESOURCES CANADA.

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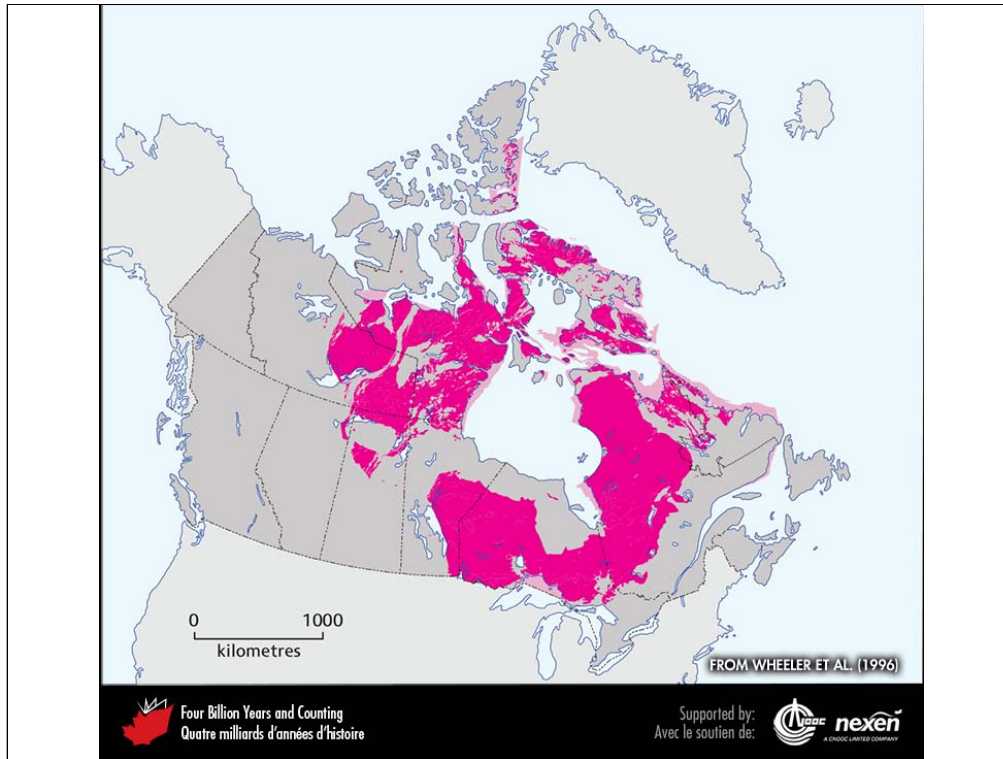
The bright and dark spots respectively shining out from or silhouetted against the Orion Nebula are planetary discs. Such discs are nascent solar systems, clouds of gas and dust surrounding a youthful star. FROM THE HUBBLESITE, COURTESY OF NASA AND STSCI.

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A thin-section of basalt from the Moon, shown in cross-polarized light. The black mineral is ilmenite, the multi-coloured mineral is pyroxene, and the grey-green striped mineral is plagioclase feldspar. The field of view is 4 millimetres across. BARRIE CLARKE.

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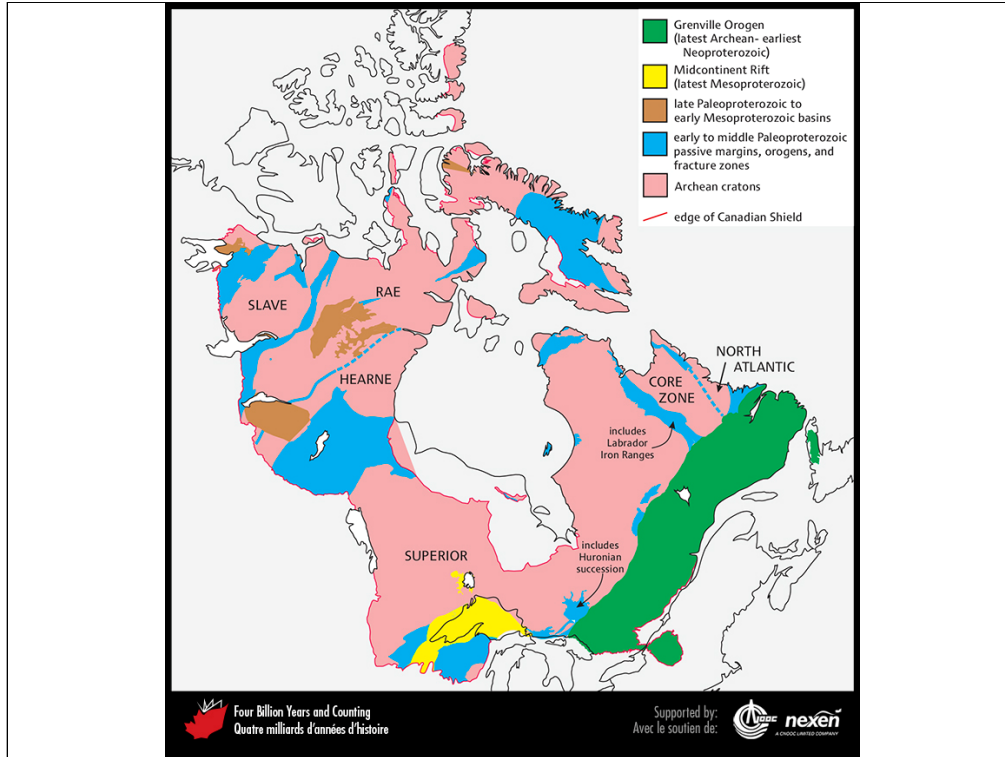
General extent of Hadean and Archean rocks at the surface (after glacial deposits are removed) of onshore and offshore Canada. The lighter shaded areas denote either uncertainty or areas where rocks of the particular age have been confirmed but are intimately associated with rocks of other ages and the scale of the map doesn't let us show them separately. ADAPTED FROM WHEELER ET AL. (1996).

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Specimen of Acasta Gneiss from the Northwest Territories, the world's oldest-known rock at 4,030 million years. The Hadean date is of the original felsic igneous rock, which was metamorphosed to gneiss during the Archean. GODFREY NOWLAN.

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The geology of the Canadian Shield.

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Part of a komatiite lava flow dated to about 2,700 million years, showing spinifex texture. This exposure is in the Abitibi Greenstone Belt of the Superior Craton, near Rouyn-Noranda, Quebec. DAVID CORRIGAN.

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CHAPTER 5

Part 2 of 2

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Komatiite, dated to around 2,700 million years old, showing columnar jointing. These rocks are from the Rae Craton on northern Baffin Island, Nunavut. MIKE YOUNG.

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Archean conglomerate from the James Bay region of northern Quebec. The conglomerate was originally a fluvial deposit that formed in a greenstone belt within the Superior Craton. It is about 2,700 million years old. JEAN GOUTIER.

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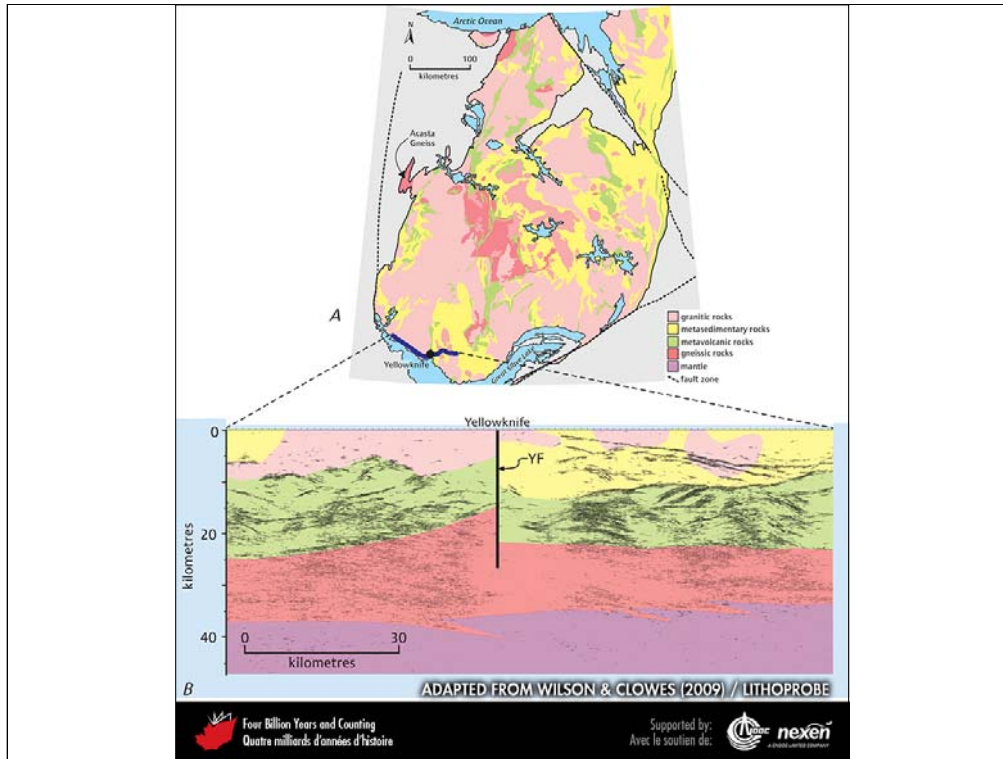
Folded Archean felsic gneisses (3,300 to 3,100 million years old) and mafic dykes (metamorphosed to amphibolite) of the North Atlantic Craton in the Hopedale area of Labrador. Mafic dykes, originally intruded typically as tabular sheets, bend and as here may break into smaller segments if the host rock is later deformed under high temperature and pressure. BRUCE RYAN.

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This view of the North Atlantic Craton on Shuldham Island in Saglék Fiord captures the major elements of the geology of the Nain area of Labrador. All rocks are gneisses; the white-weathering exposures to the right and at centre are derived from granitic rocks, the brown-weathering exposures originated from sedimentary rocks, and the black-weathering exposures to the left are metamorphosed mafic volcanic rocks. BRUCE RYAN.

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A is a simplified geological map of the Slave Craton (coloured areas). B is a section across part of the southernmost Slave Craton showing basic geology interpreted from a LITHOPROBE seismic section (blue line in A). YF indicates the Yellowknife Fault, a strike-slip fault in which the block to the right has moved toward the reader and the block to the left has moved away. ADAPTED FROM WILSON AND CLOWES (2009), COURTESY OF LITHOPROBE.

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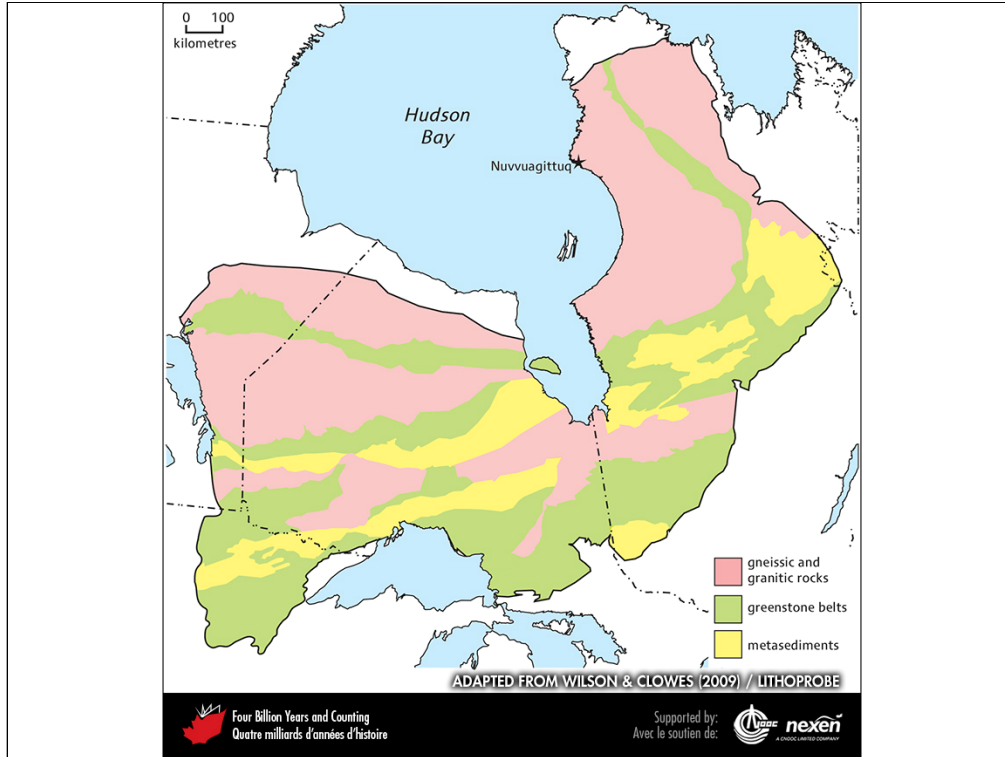
Archean pillow lava (top) deposited on cross-bedded sandstone (below), Slave Craton, Yellowknife, Northwest Territories. RAY PRICE.

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Granite dykes intruding amphibolite within the Superior Craton near Lake Minto, Quebec.
JOHN PERCIVAL.

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Simplified geological map of the Superior Craton. ADAPTED FROM WILSON AND CLOWES (2009), COURTESY OF LITHOPROBE.

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Modern stromatolites at Shark Bay, Western Australia. ANDREW KNOLL.

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These large ovoid stromatolites in the western part of the Superior Craton, at Steep Rock Lake, Ontario, are 2,800 million years old. Note the hammer at bottom right-centre for scale. JOHN PERCIVAL.

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Archean banded iron formation, about 2,700 million years old, from the Sherman Mine, Temagami, Ontario. This example consists of red jasper interbedded with grey magnetite. BRIAN PRATT.

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