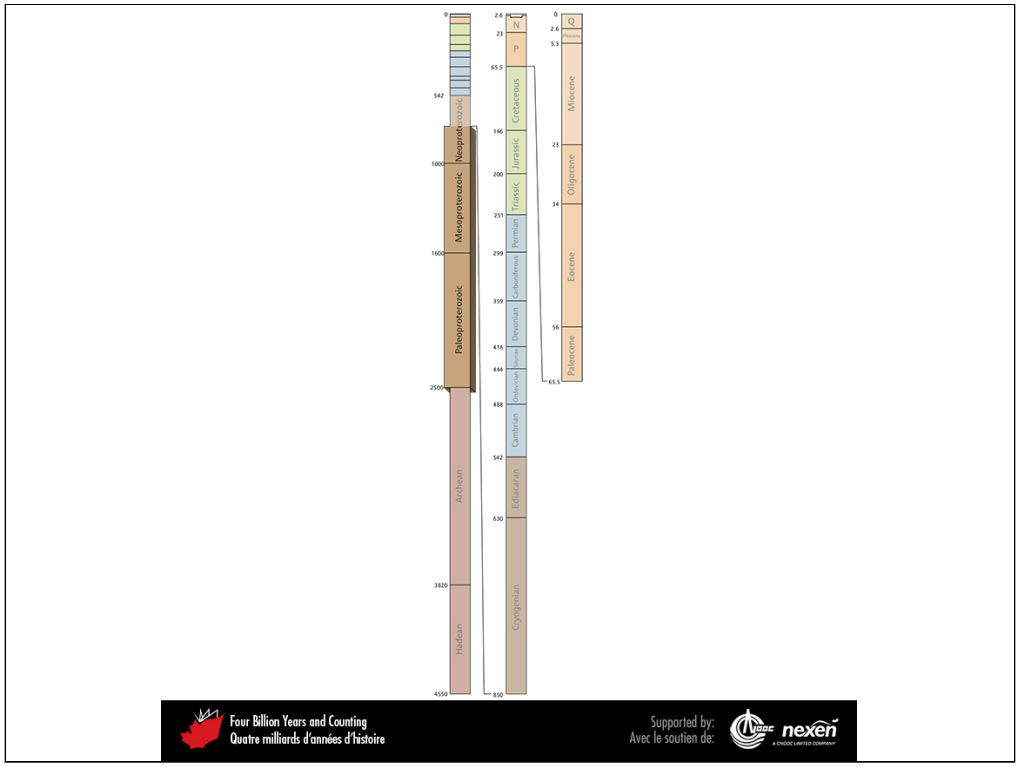
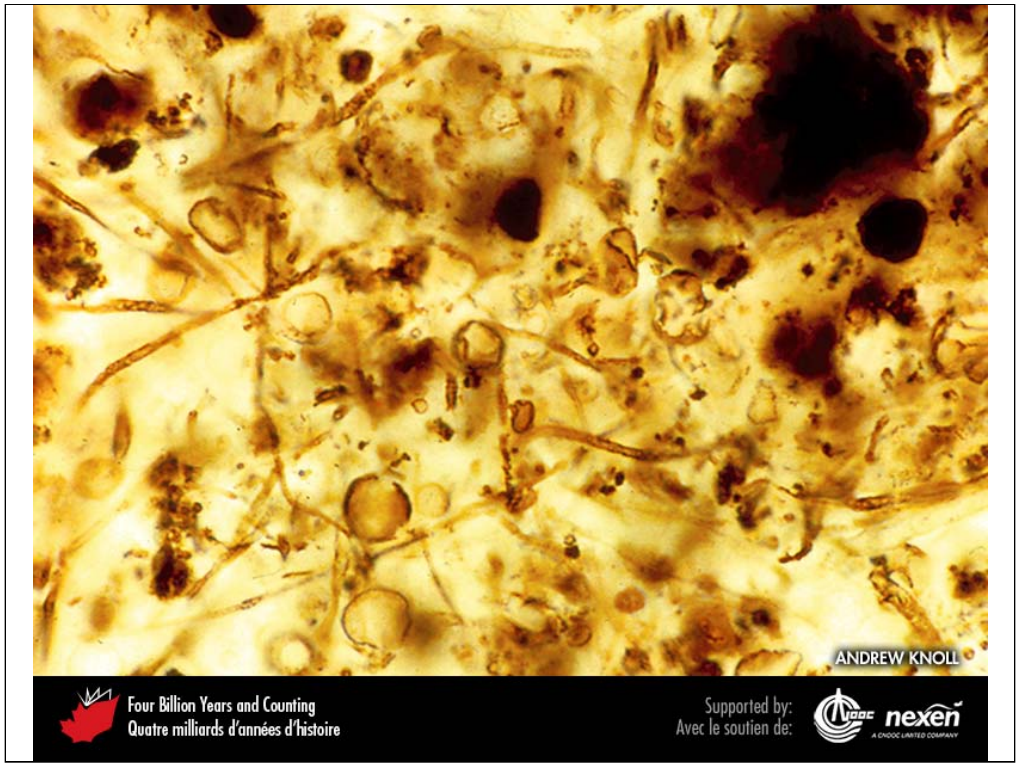
CHAPTER 6
Part 1 of 2

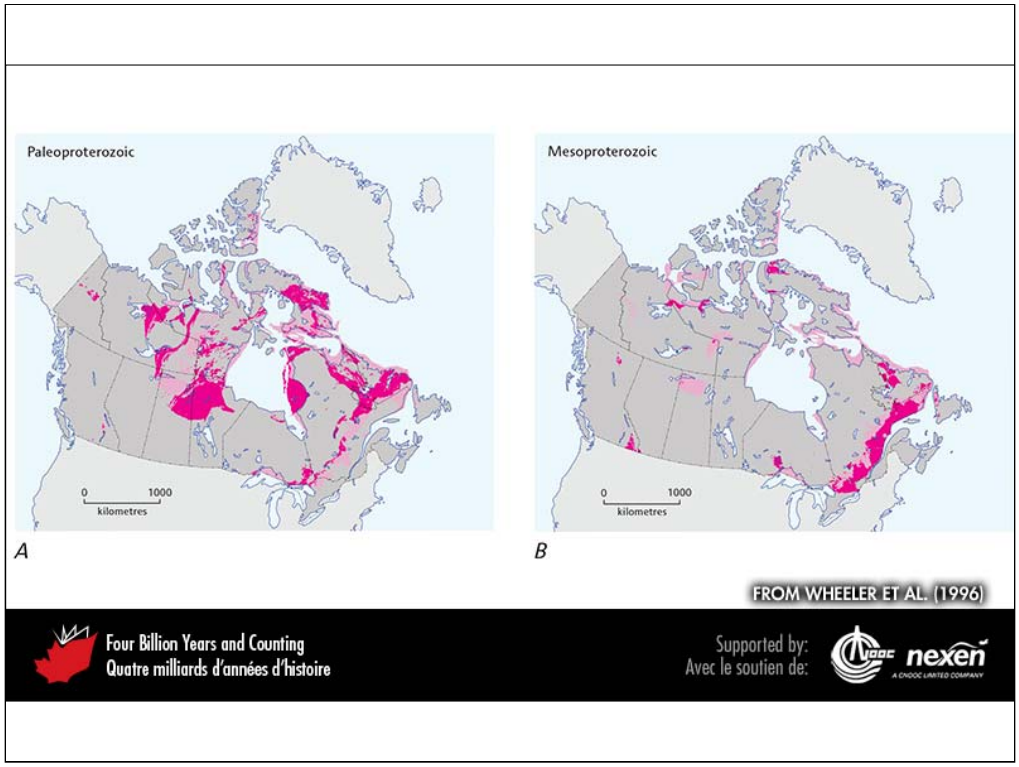
In this view of the front ranges of the northern Mackenzie Mountains, Northwest Territories, Neoproterozoic deltaic deposits of the Amundsen-Mackenzie Mountains Basin are represented by resistant quartz-rich sandstone overlain by brown shaly layers. HENDRIK FALCK.



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.



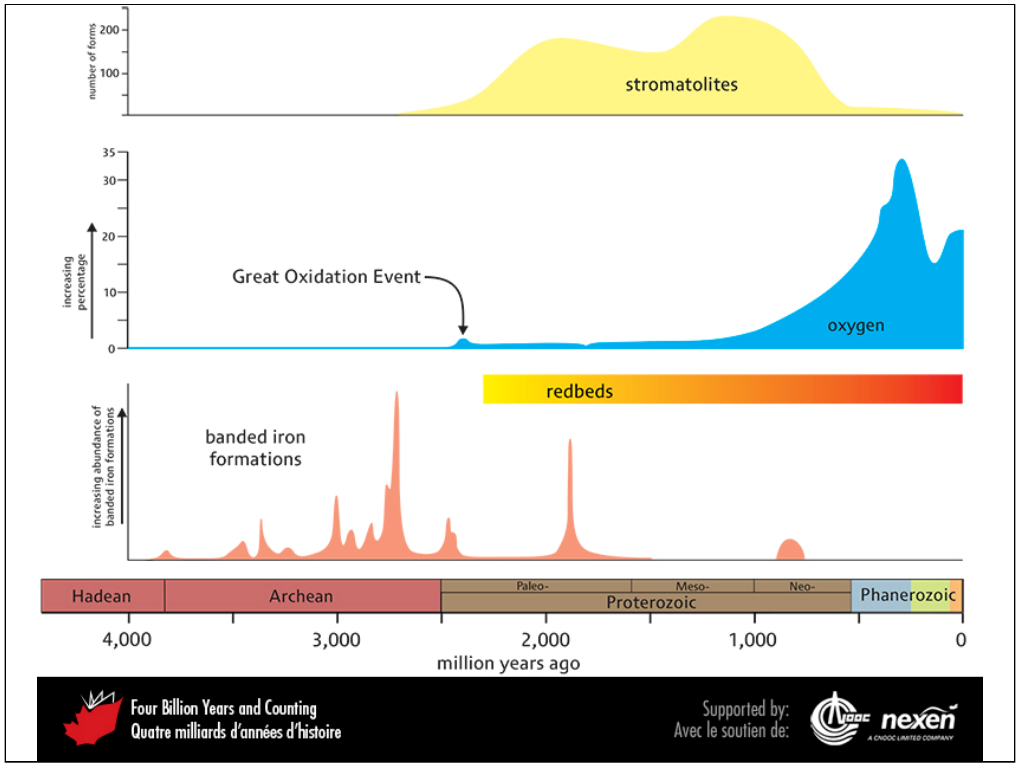
Stanley Tyler set off the search for Precambrian life when he observed microfossils such as these in thin sections of Gunflint chert from northern Ontario. ANDREW KNOLL.



General extent of Paleoproterozoic (*A*) and Mesoproterozoic (*B*) rocks at the surface (beneath glacial deposits), onshore and offshore. 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 allow us to show them separately. ADAPTED FROM WHEELER ET AL. (1996).

Archean gneisses of the North Atlantic Craton are intruded by Paleoproterozoic mafic dykes, which are the dark bands in this 300-metre-high cliff north of Saglek Fiord, Labrador. BRUCE RYAN.

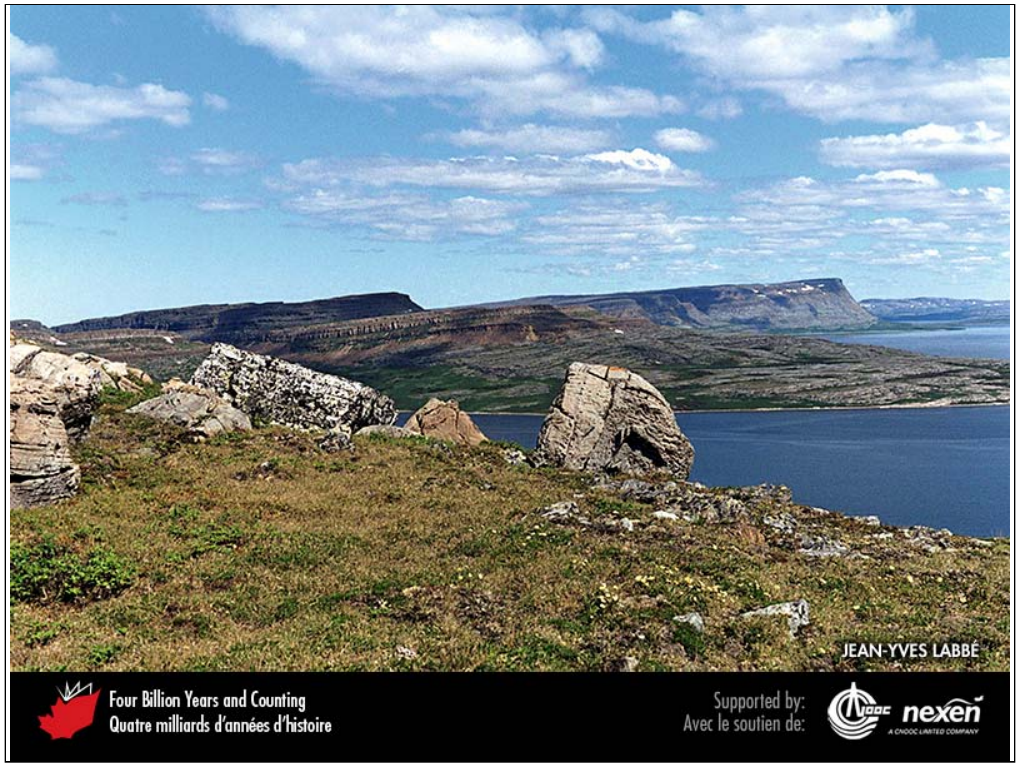
Early Paleoproterozoic white sandstones in Killarney Provincial Park, Ontario. These rocks are part of the Huronian passive-margin succession. SASKIA ERDMANN.



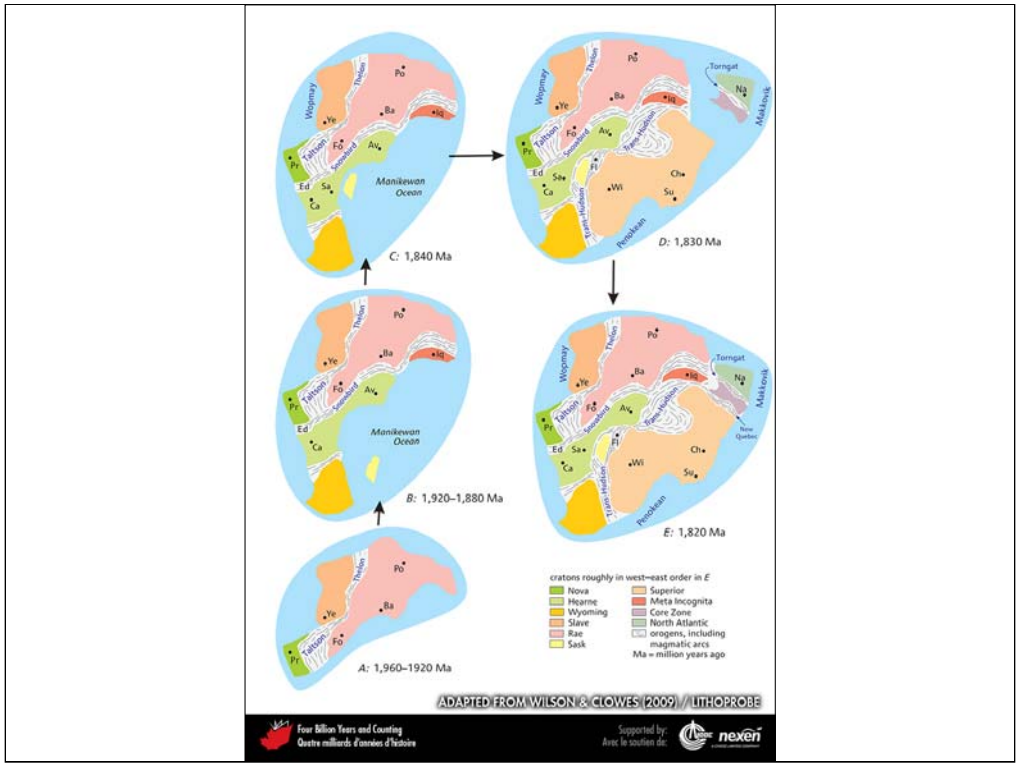
Distribution through time of banded iron formations, redbeds, and stromatolites, and the changing atmospheric concentrations of oxygen. ADAPTED FROM VARIOUS SOURCES INCLUDING, ILYIN (2009), LYONS AND REINHARD (2009), RASMUSSENET AL . (2012), AND WALTERS AND HEYS (1985).

This Paleoproterozoic conglomerate near Elliot Lake, Ontario, is part of the Huronian passive-margin succession and is probably a debris-flow deposit. ROB RAINBIRD.

Tillite from the Paleoproterozoic Huronian succession, near Elliot Lake, Ontario. The alignment of the rock fragments is evidence that they were deposited beneath a flowing glacier. DARREL LONG.



In this scene at Lac Guillaume-Delisle, northern Quebec, the flat-topped hills in the middle distance are underlain by undeformed, 2,000-year-old, rift and passive-margin strata on a flank of the Superior Craton. The lower slopes are underlain by Archean gneiss. JEAN-YVES LABBÉ.



The gradual coming together of Archean cratons (*A*–*D*) to form the Proterozoic supercontinent Nuna (*E*). The individual cratons are colour coded, as shown in the legend, and the locations of modern communities are shown for orientation: Av = Arviat, Nunavut; Ba = Baker Lake, Nunavut; Ca = Calgary, Alberta; Ch = Chibougamau, Quebec; Ed = Edmonton, Alberta; Fl = Flin Flon, Manitoba; Fo = Fond du Lac, Saskatchewan; Iq = Iqaluit, Nunavut; Na = Nain, Labrador; Po = Pond Inlet, Nunavut; Pr = Prince Rupert, British Columbia; Sa = Saskatoon, Saskatchewan; Su = Sudbury, Ontario; Wi = Winnipeg, Manitoba; Ye = Yellowknife, Northwest Territories.

Sandstone with giant cross-beds on Melville Peninsula, Nunavut. These rocks originated as eolian or fluvial sediments, which were deposited about 1,850 million years ago on Archean rocks of the Rae Craton during formation of the supercontinent Nuna. DAVID CORRIGAN.

These mountains in Auyuittuq National Park of Canada on southeastern Baffin Island are formed from granitic rocks of the Paleoproterozoic Cumberland Batholith. The Batholith was intruded along a subduction zone during the Trans-Hudson Orogeny 1,900 to 1,800 million years ago. J. POITEVIN, COPYRIGHT PARKS CANADA.

Intensely deformed conglomerate and amphibolite at Amisk Lake, northern Saskatchewan. The conglomerate originated as a river deposit 1,840 million years ago above rocks of the Flin Flon magmatic arc in the heart of the Nuna supercontinent. The amphibolite was originally a mafic sill that intruded the conglomerate. Some of the clasts are stretched, whereas others are only slightly distorted. LEN GAL.

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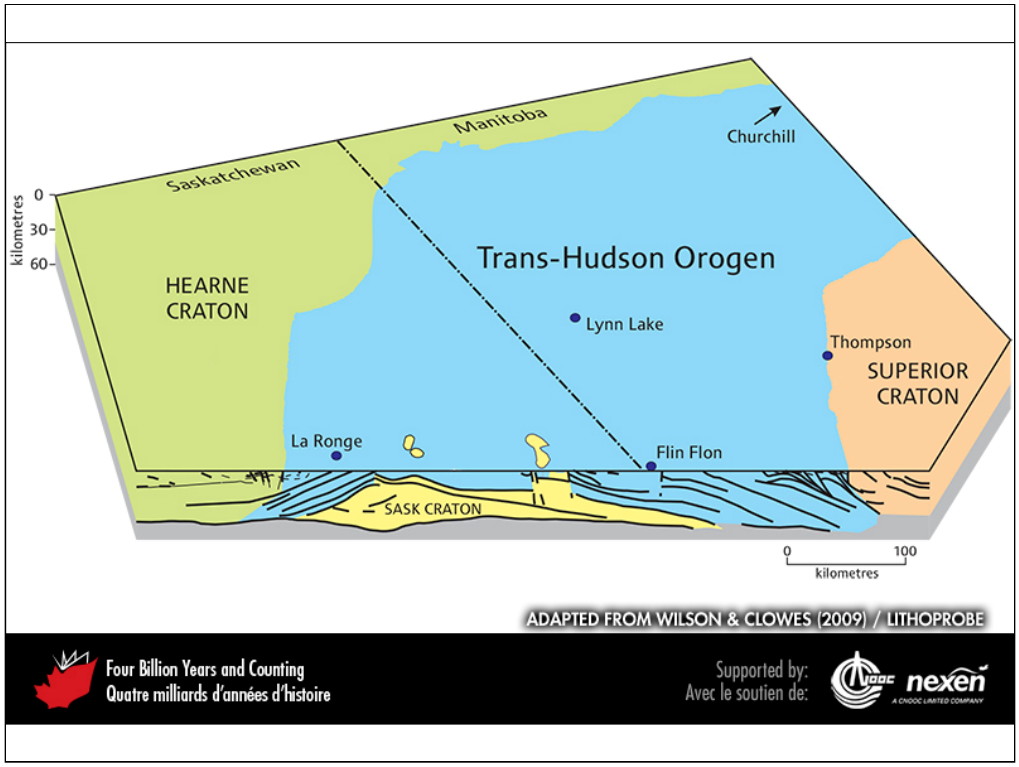
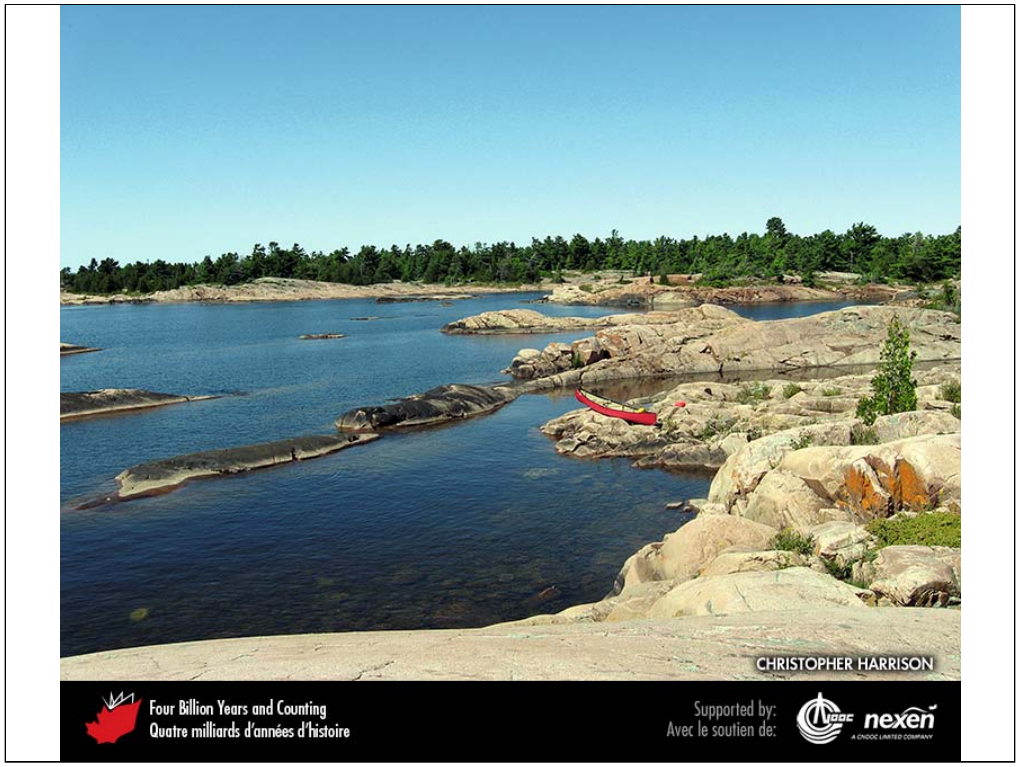


Block diagram showing how the Sask Craton is caught between the western Superior and Hearne margins and accounts for the greater width of the Trans-Hudson Orogen in parts of northern Saskatchewan and Manitoba. ADAPTED FROM WILSON AND CLOWES (2009), COURTESY OF LITHOPROBE.



Ice-sculpted, 1,650-million-year-old granite and gneiss on the south side of Philip Edward Island, Georgian Bay. These rocks formed in magmatic arcs of the Grenville Orogen on the southeastern side of Nuna. CHRISTOPHER HARRISON.

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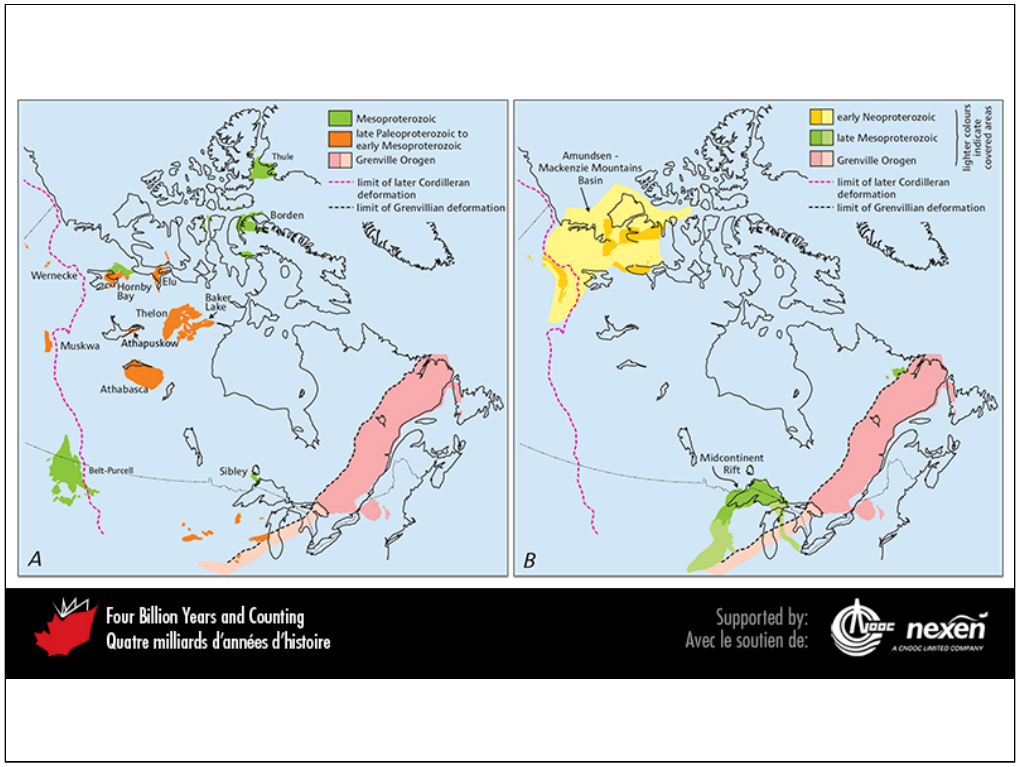
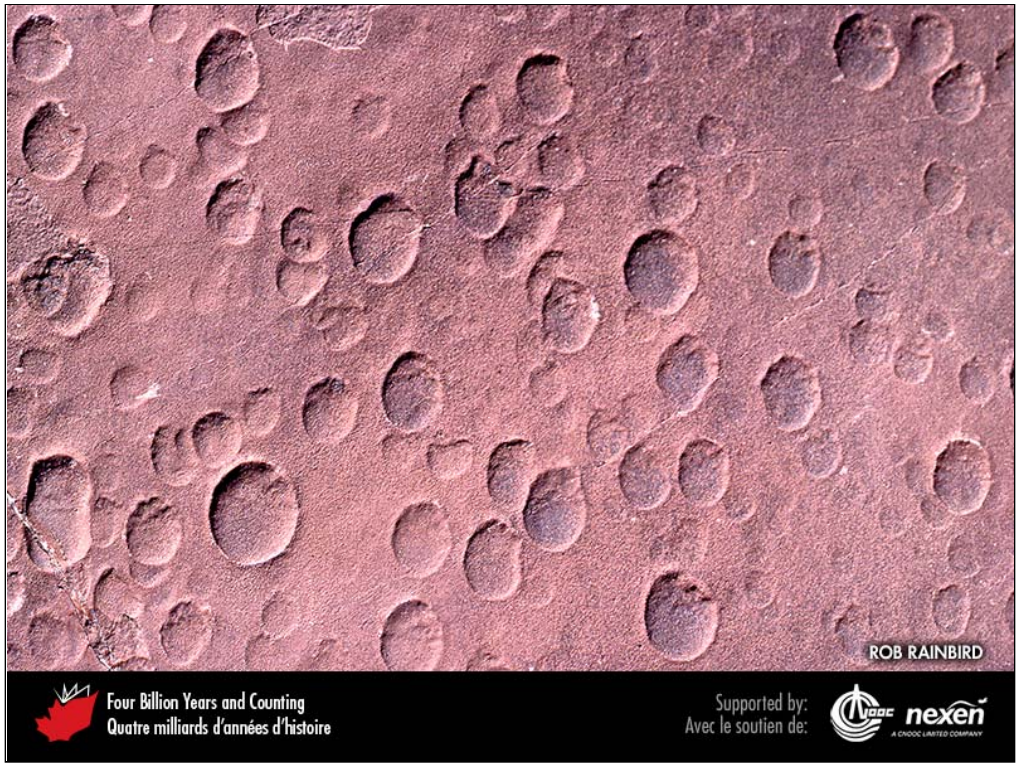


Map showing the Grenville Orogen and the continental-interior basins that existed in what was to become part of North America during the intervals from 1,800 to 1,300 million years ago (*A*) and 1,300 to 750 million years ago (*B*). ADAPTED FROM VARIOUS SOURCES.



Paleoproterozoic raindrop prints in redbeds of the Baker Lake Basin, Nunavut. ROB RAINBIRD.

Mesoproterozoic red argillite viewed from the Carthew-Alderson Trail, Waterton Lakes National Park of Canada, Alberta. W. LYNCH, COPYRIGHT PARKS CANADA.

Red Rock Canyon in Waterton Lakes National Park of Canada is aptly named for the red argillite (1,500 million years old), which was formed from iron-rich sediments deposited on ancient tidal mudflats. JOHN WILLIAM WEBB.

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View north along the eastern flank of Adams Sound, south of the community of Arctic Bay on Baffin Island, Nunavut. Here, Mesoproterozoic lava flows (the steep face in the middle part of the cliff) unconformably overlie Paleoproterozoic gneisses (the gentler slopes near the base of the cliff). The red rocks near the top of the cliff are Mesoproterozoic marine sandstones of the Borden Basin. DARREL LONG.

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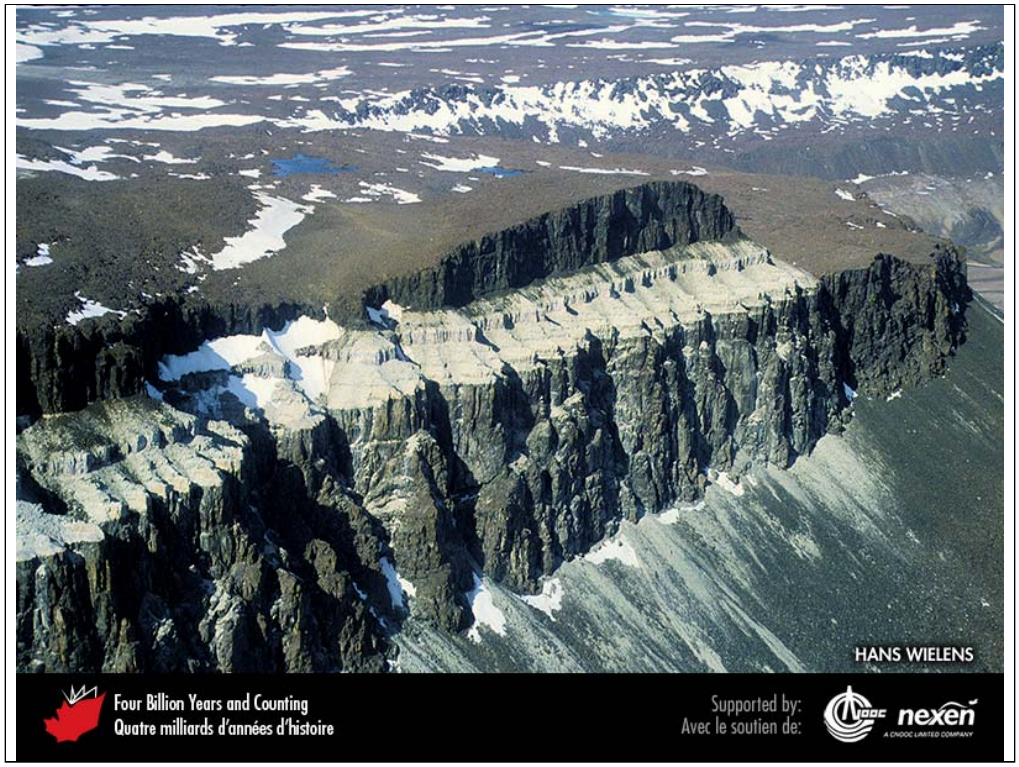

The Coppermine Basalts, here exposed near Kugluktuk, Nunavut, were extruded 1,240 million years ago above a hot spot centred on Victoria Island. They are associated with the Mackenzie Dyke Swarm (Chapter 1). The Coppermine Basalts, named for the native copper they contain, consist of about 150 individual lava flows, each 10 to 25 metres thick. HANS WIELENS.

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Mount Lister is an 850-metre-high bald massif on the north side of Tikkoatokak Bay, west of Nain, Labrador. It is underlain by massive pale grey anorthosite of the Nain region, intruded between 1,360 and 1,290 million years ago. BRUCE RYAN.

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These rocks on the western side of Franklin Island in Georgian Bay, Ontario, originated between 1,680 and 1,400 million years ago and were metamorphosed and deformed to folded gneiss during the Grenvillian Orogeny about 1,000 million years ago. CHRISTOPHER HARRISON.

Layering in this rock from Parry Sound, Ontario, is not sedimentary but was produced by intense heating and compression of many igneous intrusions deep within the crust during the Grenvillian Orogeny. DAVID CORRIGAN.

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Neoproterozoic sandstones and shales of the Amundsen-Mackenzie Mountains Basin in the Backbone Ranges, Mackenzie Mountains, Northwest Territories. HENDRICK FALCK.

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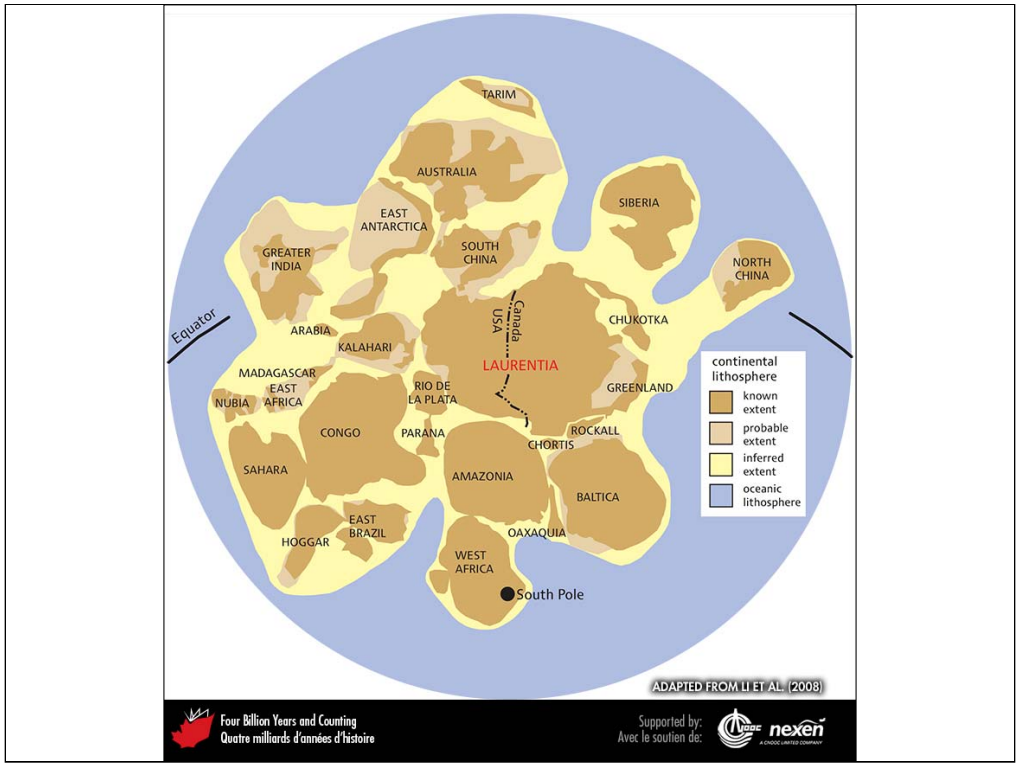
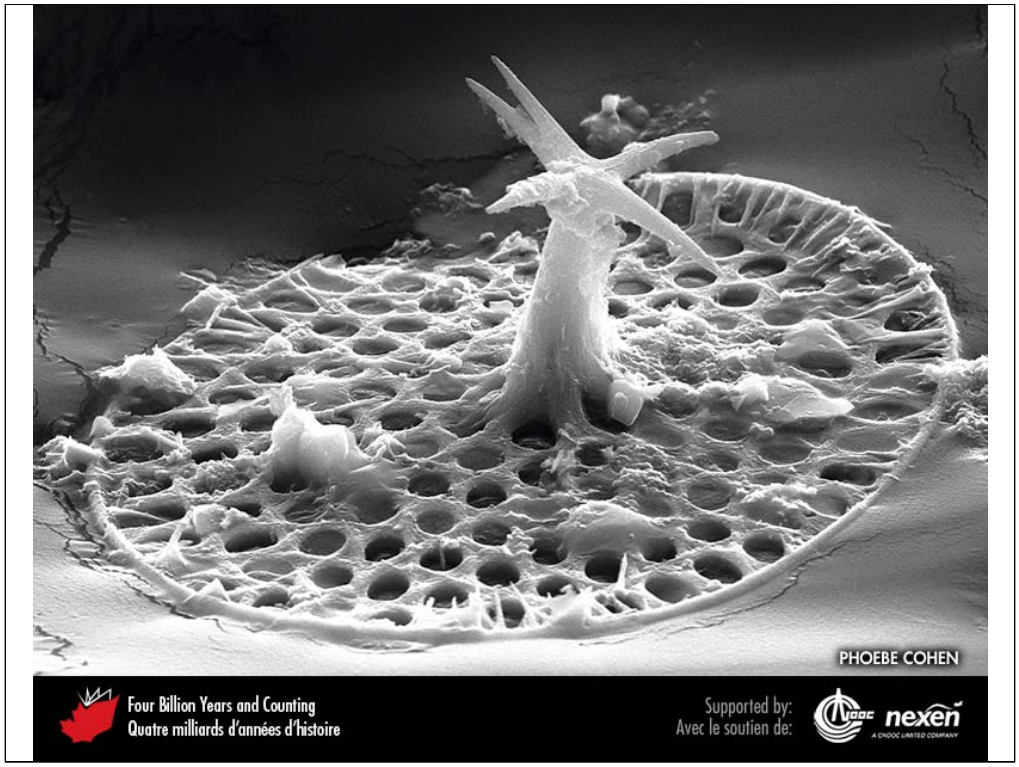
Redbeds at the base of this road cut on the Trans-Canada Highway, just east of Nipigon, Ontario, were deposited in the small Sibley Basin 1,550 to 1,400 million years ago. Above the redbeds is a mafic sill, intruded about 1,100 million years ago during formation of the Midcontinent Rift. GRAHAM WILSON.



Map of the Rodinia showing the possible distribution within that supercontinent of later continental elements. ADAPTED FROM LI E T AL. (2008).

Bangiomorpha pubescens, a red alga from Mesoproterozoic (1,200-million-year-old) rocks on Somerset Island, Nunavut. The specimen is just under 0.2 millimetres long. NICK BUTTERFIELD.



The microfossil *Characodictyon*, composed of calcium phosphate, from Yukon's Mount Slipper in the Amundsen-Mackenzie Mountains Basin. PHOEBE COHEN.
