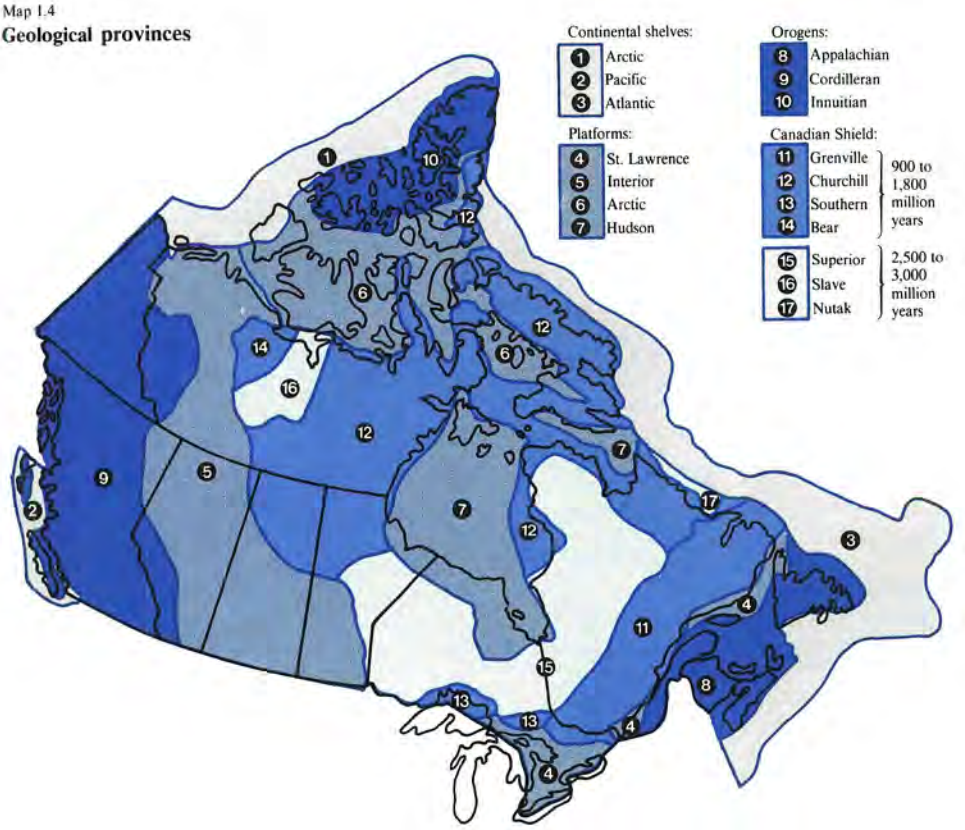
Map 1.4
Geological provinces



1.3.1 Geological time scale

The age of the earth, which may be at least 4,600 million years old, reveals the immensity of geological time. In Canada the oldest rocks dated by the decay of radioactive elements occur in northern Labrador and are about 3,800 million years old. The geological time chart shows how the major time divisions, known as eons, are divided into eras which, in the Phanerozoic, are subdivided into periods. Fossils, the remains of ancient animals and plants, indicate the characteristic life of past times, and provide the chief means of correlating rocks formed at different periods on different continents. Man's recognizable ancestors are about 5 million years old.

The Phanerozoic (time of obvious life) eon is divided into three eras: The Paleozoic (time of ancient life, chiefly invertebrates), the Mesozoic (time of middle life, chiefly reptiles) and the Cenozoic (time of modern life, dominantly mammals). Time prior to the Paleozoic, known as Precambrian, is made up of two eons, the Archean and Proterozoic, the latter divided into Aphebian, Helikian and Hadrynian eras. The vast span of the Precambrian is not obvious on the geological time chart. It began with the formation of Earth and ended 570 million years ago, thus accounting for seven-eighths of the geological record.

The Precambrian-Cambrian boundary marks the time when there was an explosive evolution in marine life and organisms developed skeletons that could be preserved as fossils in the strata of sedimentary rocks. Although Precambrian fossils are rare, because organisms at those times were soft-bodied and difficult to preserve, there was life long before shelly animals appeared 570 million years ago. Life existed in what is now Canada over 2,500 million years ago and is preserved in Archean carbonates as stromatolites, laminated structures that represent intertidal algal mats containing bacteria.

1.3.2 Geological provinces

Canada is made up of 17 geological provinces which are of four major categories; shield, orogen, platform and shelf.

The Precambrian Shield is a vast region covering most of eastern and north-central Canada in a broad band around Hudson Bay. It is composed of seven geological provinces. Three of them, Superior, Slave and Nutak, were deformed during the Archean eon and contain the oldest continental crust known in Canada ranging from 2,500 to over 3,000 million years in age. Churchill, Southern and Bear provinces embrace ancient mountain belts produced 1,750 million years ago during a major Proterozoic orogeny.