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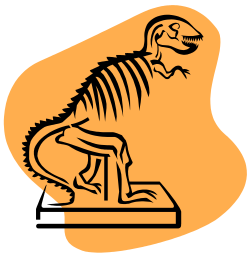

Evolution of life and relief

SUGGESTED REFERENCE DOCUMENTS

Geography 314 school manual
School manual for the 1st cycle of secondary school and 1st year of 2nd cycle of secondary school.

"Flash" format animation
The Earth by the Center for Pedagogical Development
http://www2.cslaval.qc.ca/cdp/UserFiles/File/previews/earth/

Interesting websites:
If the Earth could talk… Natural Resources Canada
http://www.cgq-qgc.ca/tous/terre/index.cfm?flag=1&CFID=827028&CFTOKEN=18950541

Geological Survey of Canada
http://gsc.nrcan.gc.ca/education_e.php

The Atlas of Canada
http://atlas.nrcan.gc.ca/site/english/index.html/document_view

Ressources naturelles et Faunes du Québec – Geological overview
http://www.mrnf.gouv.qc.ca/english/mines/geology/index.jsp

Planète Terre par Pierre-André Bourque du Département de Géologie et de Génie géologique de l'Université Laval
http://www.ggl.ulaval.ca/personnel/bourque/intro.pt/planete_terre.html

Déroulement de l'évolution de la vie sur la Terre – Centre national de la recherche scientifique
http://www.cnrs.fr/cw/dossiers/dosevol/decouv/normal/normal.html

Source : Ressources naturelles et Faunes du Québec – Geological overview
http://www.mrnf.gouv.qc.ca/english/mines/geology/geology-overview.jsp

Geological Overview

Nearly 90% of Québec's bedrock is composed of Precambrian rocks of the Canadian Shield (north of the St. Lawrence River). The remaining bedrock essentially consists of Paleozoic rocks that form the St. Lawrence Platform, along the shores of the St. Lawrence River, and the Appalachians, south of the river. These different environments offer interesting opportunities for exploration.

Map of the geological provinces (**PDF format, 98,6 kb**)

The interpretation of Precambrian and Paleozoic rocks in eastern Canada has considerably evolved over the last few decades, thanks to a better understanding of geological and tectonic processes. For instance, an updated subdivision of geological provinces into subprovinces was developed. These subdivisions evolve as new geochronological data is released, particularly in the case of orogenic events that affected the Archean craton, which is a major component of the Shield.

The **Superior Province** (4 to 2.5 Ga) forms a large portion of the North American continent, and covers a third of Québec's landmass, i.e. a surface area of 600,000 km². This geological province forms the central part of the Canadian Shield. It is world-renowned for its numerous copper, gold, zinc, nickel and silver deposits. More recently, it was also the site of important discoveries of diamond occurrences.

Moreover, it is subdivided into about a dozen subprovinces, half of which are located in Québec. The most famous one is the Abitibi Subprovince, the largest Archean volcano-sedimentary belt in the world, renowned for its copper, zinc, silver and gold deposits. Rocks of the Superior Province are bounded to the east by the Churchill Province and to the southeast by the Grenville Province.

The **Churchill Province** (2.1 to 1.75 Ga) covers a surface area of about 150,000 km² in the North part of Québec, northeast of the Superior Province. It is characterized by four zones:

- The Ungava Orogen (Ungava Trough), which borders the Superior Province to the north, and is known for its nickel-copper deposits (namely the Raglan mining camp);
- the Nouveau-Québec Orogen (Labrador Trough), which borders the Superior Province to the east, and whose rocks host important iron ore deposits as well as several deposits of copper, nickel and platinum group elements (PGE);
- the Rae Province (or Far North craton), wedged between the Nouveau-Québec and Torngat orogens, and which contains Archean and Paleoproterozoic rocks (2.1 to 1.75 Ga) and Mesoproterozoic plutonic rocks (1.7 to 1.1 Ga);
- The Torngat Orogen (2.1 to 1.75 Ga), located east of the Rae Province, offers exploration potential for diamond deposits.

The **Grenville Province** (1.2 Ga to 950 Ma) also covers a surface area of 600,000 km². It forms the southeastern margin of the Superior Province, and is divided into three distinct belts. The Grenville Province is known for its iron and ilmenite mines, its industrial mineral potential, and less so for its base metal potential.

The St. Lawrence Lowlands (700 to 350 Ma) developed at the end of the Proterozoic and during the Paleozoic, with the formation of the St. Lawrence graben. The Lowlands are divided into two platforms, the St. Lawrence Platform and the Anticosti Platform. They overlie rocks of the Grenville Province. The dominant mined resource is limestone. Two carbonatite intrusions, in Saint-Honoré and Oka, host niobium deposits. Québec is the second producer in the world for this rare metal.

South of the Grenville Province, the **Appalachian Orogen** (650 to 350 Ma) developed along the margin of the Canadian Shield during the Paleozoic. The Appalachian Orogen is divided into three belts, and is bounded to the east by the Permo-Carboniferous Magdalen Basin. Important asbestos resources and copper deposits at Mines Gaspé are found in this geological province.

Extensive glaciation periods, dating back to the Quaternary, affected Québec's landmass. As a result, important glacial deposits cover vast surface areas in the south part of the province, and these deposits constitute important sources of sand and gravel.