

reefs containing many openings, although 'stratigraphic' traps such as lenses of porous sediments in non-porous ones are also important. Exploration for oil and gas has recently been extended through most of the plains including those in the Arctic Archipelago. The Athabasca oil sands, extending for more than 100 miles along the Athabasca River in northern Alberta, are accumulations of heavy oil and sand of Lower Cretaceous age; the total amount of oil is estimated at 100,000 to 300,000 million barrels, more than all other known reserves of the world. Coal is being or has been produced from many places in the Great Plains. They also yield potash, salt, gypsum, limestone and other non-metalliferous products. The only important known metalliferous deposits are of zinc and lead, in Devonian limestone at Great Slave Lake.

The Arctic Lowlands and Plateaux form most of the southern part of the Arctic Archipelago, lying between the Innuitian Region and the exposed part of the Shield. They are underlain mainly by Ordovician and Silurian limestone, dolomite and shaly dolomite, but strata of Cambrian, Devonian and Tertiary ages are also present. Some of the beds contain coal. Active interest is now being shown in the oil and gas possibilities of the strata.

West and east of the Frontenac Axis, the Great Lakes and St. Lawrence Lowlands are underlain by gently dipping beds of limestone, dolomite, sandstone, and shale of Cambrian, Ordovician, Silurian, Devonian and Mississippian ages. West of the Axis they have a total thickness of 5,877 feet but few places are underlain by all formations; the greatest thickness penetrated by drilling is 4,727 feet. East of the Axis, formations in Quebec have a total thickness of at least 10,000 feet. Ordovician and Silurian strata are exposed on Anticosti Island. The first petroleum field in Canada was in the area north of Lake Erie, which is still producing natural gas and some oil. Most oil was derived from Devonian strata and most gas from Silurian. Important amounts of salt and building materials are produced from the St. Lawrence Lowlands but only a few metalliferous occurrences have been found other than the Marmora iron deposit which is in Precambrian rocks that were overlapped by a thin covering of Palæozoic strata and so are technically within the Lowlands.

Exceptions to the flat character of the St. Lawrence Lowlands are the Monteregian Hills at and near Montreal. These are the remnants of small alkaline igneous intrusions of Devonian or younger age, which are more resistant to erosion than the surrounding strata.

An area extending for about 800 miles between Churchill and the south end of James Bay is underlain by Ordovician, Silurian and Devonian strata composed largely of limestone and dolomite and by a smaller amount of Jurassic or Cretaceous strata. The thickness of this assemblage of sedimentary rocks is not well known because outcrops are scarce and little drilling has been done. Large deposits of gypsum have been found in the Devonian succession and substantial lignite deposits occur in Mesozoic beds.

The Cordilleran Region.—The Cordillera are on the site of a great geosyncline where sediments were laid down at least as early as late Precambrian time, where marine sedimentation continued in places as late as the Upper Cretaceous, and where freshwater sediments were deposited locally during the Tertiary.

In parts of the interior of British Columbia and the Yukon are exposed highly metamorphosed rocks bearing some resemblance to the Archæan of the Shield. All available evidence indicates, however, that these are partly late Precambrian and partly younger strata that were metamorphosed in pre-Permian and, probably, partly in Precambrian time.

The oldest strata whose age is clear are beds of quartzite, argillite, dolomite and other sedimentary rocks totalling many thousands of feet, principally in the Cariboo, Purcell, Selkirk and Rocky Mountains. In places, these unfossiliferous beds are overlain by others containing Lower Cambrian fossils. In general, the Cambrian rests unconformably on the rocks beneath but in many places there is no marked unconformity. It is concluded, therefore, that at least some of the Precambrian strata may be younger than any strata classed as Proterozoic in the Shield and may have been deposited during the time when the Shield was being eroded before Palæozoic sediments were deposited on it.