

The Innuitian Orogen. During the early Paleozoic, Franklinian Geosyncline extended from eastern Greenland along the northern margin of the continent into Alaska. In the Arctic Islands, it was initiated in the late Precambrian, underwent minor deformation during the Cambrian and Early Devonian, but was severely deformed only in the Devonian-Mississippian Ellesmerian Orogeny. Superimposed upon the deformed belt is Sverdrup Basin which contains a thick, concordant succession, late Paleozoic to Tertiary in age, that was deformed by the Tertiary Eureka Orogeny in the northeast and by evaporite diapirism in the southwest.

The Hadrynian and Cambrian consist of dolomite, shale, quartzite and some meta-sedimentary and meta-volcanic rocks. Thick Ordovician to Devonian carbonate sequences are partly reefy or interbedded with anhydrite and grade abruptly northward into graptolitic shale. Clastics and volcanics bordering the Arctic Ocean are metamorphosed and intruded by granite during Ellesmerian Orogeny.

In Sverdrup Basin, Pennsylvanian and Permian sandstone grade northwestward into limestone, shale, biohermal reefs, and anhydrite, the source for the evaporite diapirs. The Mesozoic is characterized by intertonguing shales and sandstones, partly non-marine, which are derived from the south, east and northwest. Recent drilling has encountered gas and oil. In Prince Patrick Uplift, the strata are broken by north-trending Jurassic and Tertiary normal faults.

1.2.4 Canadian Shield

The Precambrian rocks of the Canadian Shield are grouped into provinces and sub-provinces on the basis of stratigraphic relationships, structural and metamorphic features produced by major orogenies, and concentrations of isotopic ages from plutonic rocks. The orogenies and isotopic ages also provide the framework for a time-classification for the Precambrian — the Kenoran Orogeny, with a mean age of 2,480 million years, occurring at the end of the Archean Eon, and the Hudsonian and Grenvillian Orogenies with mean ages of 1,735 and 955 million years, respectively, at the end of the Aphebian and Helikian Eras. These latter, together with the Hadrynian Era, constitute the Proterozoic Eon. The Elsonian plutonic event, with a mean age of 1,390 million years, serves to divide the Helikian into the Paleohelikian and Neohelikian Sub-eras. The limits of the provinces do not correspond with those of the old orogenic belt, e.g., the Archean rocks of Kenoran Orogen extend beyond Superior Province into Grenville and Churchill Provinces. Furthermore, many of the orogenic belts of the Shield are largely denuded of the supracrustal rocks that were laid down in the depositional interval preceding the major orogeny. Large parts are composed of rocks that formed the basement upon which the sequences were deposited and which reflect the deformation that occurred deep within the crust beneath the mountain belt, now entirely destroyed by erosion.

Grenville Province is a linear orogenic belt that transects several other structural provinces of the Shield and extends beneath Appalachian Orogen, possibly to the continental border. Archean rocks, separated from those of the Superior Province by a metamorphic front, are massive granites and gneisses derived from volcanic and sedimentary rocks. The Aphebian is represented by paragneiss and schist with remnants of quartzite, marble, and iron-formation, the latter containing the magnetite and specularite orebodies at Wabush Lake and Lac Jeannine.

The Paleohelikian includes thick marble, quartzite, and paragneiss with minor volcanics. The Elsonian intrusions, accompanied by high-grade metamorphism, are layered anorthosite with border phases of mangerite. The intrusions contain bands of ilmenite-hematite and titaniferous magnetite which are mined at Lac Tio and St. Urbain. Neohelikian rocks occur as paragneiss and schist remnants and as a thick sequence of red clastics, limestone, basalt and diabase sills in Naskaupi Fold Belt. Related to the Grenvillian Orogeny are quartz monzonite, syenite and nepheline syenite bodies, northeast-trending folds, and moderate- to high-grade metamorphism. Small, unconformable remnants of Hadrynian arkose occur.

Southern Province. Only disconnected parts of Southern Province lie in Canada. Within the Penokean Fold Belt the early Aphebian Huronian succession embraces four unconformity-bounded groups, each composed of a basal conglomerate, possibly tillite, overlain by argillite, quartzite, and limestone. Some conglomerates at Blind River are rich in uraninite, and constitute most of the uranium reserves. The Huronian is intruded by the Nipissing diabase (2,150 million years). The uppermost group overlaps northward onto the