

rocks, so that the assemblage in places bears much resemblance to Keewatin groups. These rocks have been described under many different local names, the Doré Series of Michipicoten, the Windigokan Series east of Lake Nipigon, the Seine Series of Rainy Lake and Steep Rock Lake, the Missi Series of northern Manitoba, etc. These clastic sediments contain boulders of granite believed to have been derived from masses intruded into the Keewatin rocks during an orogeny referred to as the Laurentian.

In the Grenville region of southern Ontario and extending across Quebec into southern Labrador, the oldest rocks are mica schists and gneisses, quartzites and crystalline limestone of what is known as the Grenville Series. In Ontario, another series, known as the Hastings, overlies the Grenville rocks with an erosional unconformity, but with little apparent structural discordance. Both the Grenville and Hastings rocks are intruded by a group of gabbros, anorthosites, pyroxene diorites and pyroxene syenites and, still later, by dykes, sills, stocks and batholiths of granite, syenite and their gneissic equivalents. The age relation of the Grenville rocks to the Keewatin volcanic rocks of the adjacent Timiskaming region is still unsettled and recent investigations seem to imply an almost, if not quite, continuous fault zone along the contact.

Archæan time was closed by a great mountain-building revolution, the Algonian, which was accompanied by the intrusion of granites on a vast scale. Peneplanation followed and on the eroded surface Proterozoic rocks were laid down. Proterozoic time, like Archæan, falls into two divisions, the Huronian and the Keweenawan, and the Huronian, in turn, comprises three recognizable subdivisions, each of which, in length of time involved, is probably of at least period rank.

The Lower Huronian rocks of Canada, termed the Bruce Series, are confined to a narrow zone along the north side of Lake Huron and stretching to about 23 miles east of Sudbury. They consist of the Copper Cliff rhyolite, and impure quartzite, greywacke, conglomerate and limestone, with a total thickness of nearly 15,000 feet. The sediments all show crossbedding, ripple-marks and other evidence of shallow water deposition.

The Cobalt Series accumulated in Middle Huronian time. It rests with little or no structural discordance on the Bruce Series, and overlaps the basement rocks for 100 miles to the north. The Series comprises two formations, the Gowganda and the Lorrain, the former having a maximum thickness of about 3,500 feet and the latter 7,000 feet or more. The Gowganda has at its base a thick boulder conglomerate—a tillite—a rock produced under glacial conditions, and this is overlain by greywacke, the upper part of which is varved suggesting that deposition took place in glacial lakes. The Lorrain consists dominantly of quartzites. Rocks resembling these Middle Huronian sediments occur in several widely scattered areas over the Shield. In the Lake Huron area, Middle Huronian time closed with movements that folded the Bruce and Cobalt Series. These movements were accompanied by the intrusion of great dykes and sills of gabbro, commonly called the Nipissing diabase.

Upper Huronian time is represented, tentatively, by several groups of rocks whose relative age is uncertain—the Animikee of the northwest shore of Lake Superior, the Nastapoka of the Belcher Islands and Richmond Gulf, the Mistassini Series of Lake Mistassini region, late Precambrian rocks of central Ungava, and other groups in the northwestern part of the Shield. These consist of conglomerate,