

eastern and south-western sides, and finally at the end of the Mesozoic era, when the Rocky mountains were elevated on the margin of the shallow interior sea. Outside of this area of mountain-building, the rocks are fairly level and undisturbed, showing comparatively stable conditions throughout the continent.

**Process of Geological Development.**—Since more than half of Canada is covered by Archæan or pre-Cambrian formations, these must first be considered. The lowest rocks are the Laurentian granites and gneisses, which latter, though once believed to be *sedimentary*, are now known to be deep-seated eruptive rocks, which pushed up as molten material into the cold rocks above, lifting them as domes and themselves solidifying slowly far below the surface. These great domes of gneiss and granite, known as batholiths, are the commonest structure of the Archæan region.

Though the Laurentian rocks are the lowest, they are not the oldest, as the Keewatin rocks were already cold and solid at the period when they were heaved upward upon the shoulders of the Laurentian. The Keewatin rocks also consist chiefly of eruptive rocks, lava flows and volcanic ash, now metamorphosed into greenstones and schists. With them are found in many places thick deposits of ordinary sediments, now changed into gneiss or mica-schist, together with the banded jasper and iron ore of the iron formation.

Much marble or crystalline limestone is also found in the Grenville series of the southern Archæan, which is probably of the same age as the Keewatin. During that period, thousands of feet of lava, ashes, mud and sand were laid down on a sea-bottom that has utterly vanished. This was followed by the eruption of the domes of gneiss, lifting the earlier rocks into great mountain ranges, which were afterwards worn down to stumps, disclosing their foundations of granite and gneiss enclosed in a rude network of Keewatin schist.

The next formation, the Huronian, consists of a great sheet of boulder clay or tillite, formed by wide-spread glaciers, and masses of water-formed sediments, now slate or quartzite or limestone. In many places the Huronian rocks still lie nearly flat on the worn surfaces of the older rocks, but in others they were caught in mountain-building operations and squeezed and rolled out into schists. The Animikie or Uppermost Huronian is also made up of sediments, very modern in appearance.

The Keweenawan is the concluding formation of the Canadian Archæan, resulting from another outburst of volcanic activity. Thousands of feet of lava, ash rocks, coarse sandstones and conglomerates were piled up on various parts of the old continent. Keweenawan intrusives are considered the source of the ores of silver, nickel and copper mined on a great scale in northern Ontario. Altogether, more than half of the Dominion owes its present configuration to forms shaped in the Archæan rocks, though overlaid and sometimes obscured by later activities.

Palæozoic formations are all well represented in Canada, limestones, shales and sandstones of its various ages (Cambrian, Ordovician, Silurian, Devonian and Carboniferous) contributing to the shaping of the country. These in many places lie almost undisturbed, but in far eastern Canada, where the Palæozoic ended with the Appalachian mountain-building period, they are crumpled into great folds or torn asunder with profound faults. The Carboniferous of the Atlantic coast is valuable for its important coal-beds.

The Mesozoic in its earlier formations (Triassic, Jurassic) is poorly represented in Canada, but its later formation, the Cretaceous, is of great importance, both for extent and economic features, its crumbling sandstones and shales underlying the prairies of western Canada and containing beds of coal at many places. During