

strata. The Grenville province contains an unusually large variety of mineral occurrences but has not been as important a producer as the Superior. Several fairly large deposits are mined, including those of nepheline syenite near Peterborough, iron of the magnetite variety at Bristol and Marmora, zinc and lead in the Ottawa Valley and iron and titanium near Havre St. Pierre. Large iron deposits are in production at the southern extension of the Labrador Trough.

The areas of undeformed Precambrian cratonic cover rocks shown on the map facing p. 21 represent dominantly clastic detritus washed into basins from the consolidated, nearby, older rocks. At times, marine incursions into these basins led to deposition of limestone and dolomite, and volcanics were deposited in others. Copper deposits similar to those of the Keweenaw Peninsula of Michigan, copper-uranium-vanadium in sandstones, and base metals in some of the limestones of the cover rocks could be present in this geological environment but economic deposits of this type have not yet been discovered.

**The Appalachian Region.**—This region comprises the Maritime Provinces and southeastern Quebec and is the northern continuation of a long belt of folded strata extending along the eastern side of the United States. It is on the site of a long, linear trough or geosyncline that existed mainly in Palaeozoic time in which great thicknesses of sedimentary and volcanic strata were laid down. The northwestern boundary of the region lies adjacent to the Canadian Shield and to the St. Lawrence Lowlands. The strata in the Appalachians have been folded and faulted along axes that strike northeasterly except for local regions such as the Gaspé Peninsula where strikes swing to the east. Thus, strata of different kinds and ages and some belts of intrusive rocks normally form northeasterly-trending bands, many of which are responsible for development and orientation of peninsulas, bays and ridges of the region. Two principal periods of orogeny called the Taconic and the Acadian have been recognized. The Taconic occurred near the close of Ordovician time and the Acadian about Middle Devonian time. In Canada the Taconic disturbances were fairly widespread, the Acadian were more so, affecting areas that were previously affected by the Taconic as well as areas that were not, and the Appalachian orogeny, which was a major feature in parts of the United States, was of minor and local importance.

Metamorphosed Precambrian rocks of Grenville type are exposed to form the Long Range of western Newfoundland and small areas in Cape Breton and New Brunswick. On the east flank of the Appalachian geosyncline, as exposed in southeast Newfoundland, younger Precambrian volcanics and sediments are relatively unaltered and were intruded by small granite bodies 580,000,000 years ago. Although Precambrian rocks probably underlie much of the central Appalachians, they are buried beneath the thick Palaeozoic sequence. Pyrophyllite in southeast Newfoundland is the only product being mined from Precambrian rocks in the Canadian Appalachians.

Cambrian slates, minor limestones and local areas of volcanics lie above and adjacent to Precambrian rocks. Massive sulphide deposits in schists derived from Cambrian volcanics in southern Cape Breton and southeast Quebec were formerly mined. The overlying Ordovician beds were formed at the early stage of development of the Appalachian geosyncline. From west to east, and depending on their position in the geosyncline, the thick Ordovician sections comprise limestone and/or slate in western Newfoundland and adjacent to the St. Lawrence Lowlands in southeast Quebec. Mineral occurrences of zinc and lead-zinc are currently being evaluated in dolomitic limestones. Of major economic importance are Ordovician submarine volcanic rocks and their metamorphic equivalents in north-central Newfoundland, the Bathurst district of northern New Brunswick, and the Eastern Townships of southeast Quebec. These rocks are the hosts for all the massive, pyritic base-metal deposits being mined and developed in the Canadian Appalachians. In particular, the Bathurst mining camp and its new smelter complex promises to be a major factor in the economy of the region for many years, and the Buchans mine in central Newfoundland has produced since 1928 from orebodies which contained more than 15,000,000 tons of ore. East of this Ordovician volcanic belt, thick deposits of slates and sandstones were formed at the same time as the mineral-bearing volcanics were