

and Quebec associated with porphyry and other granitic rocks. The gold-bearing copper ores of western Quebec, the zinc-copper ores of northern Manitoba, the pitchblende and silver deposits of Great Bear lake are other important mineral occurrences which are being developed. In eastern Ontario and western Quebec, where granite has intruded limestone and other sediments of the Grenville series, occur deposits of mica, graphite, feldspar, magnesite, fluorite, kaolin, molybdenite, talc, apatite, and other minerals.

The St. Lawrence Region.—The St. Lawrence Region is a lowland which stretches westward from Quebec city for a distance of some 600 miles to lake Huron. It begins as a narrow strip bordering each side of the St. Lawrence and gradually widens until at Montreal it has a width of 120 miles. Its northerly border continues on up the Ottawa river but 50 miles west of Ottawa the belt is interrupted by a projection of the Canadian Shield known as the Frontenac axis which extends southward crossing the St. Lawrence between Kingston and Brockville. West of this axis the lowland occupies a triangular area lying between lakes Ontario, Erie, and Huron and an east and west line drawn from Kingston to the south end of Georgian bay. This western part in turn falls into two divisions separated from each other by a prominent topographic feature, the Niagara escarpment, an abrupt, eastward-facing rise of 250 to 300 feet, extending from Niagara river in a northwest direction to Bruce peninsula. Still farther to the northwest, the escarpment is continued by the northward-facing cliffs of Manitoulin and adjacent islands.

The St. Lawrence Region is underlain by Palæozoic strata ranging in age from late Cambrian to late Devonian. For the most part the beds lie flat or at low angles. In places, however, as in southwestern Ontario, they are folded into broad low domes and elsewhere, as in the vicinity of Ottawa, they are traversed by faults of considerable magnitude. In general the beds dip away from the Canadian Shield so that as one proceeds in a direction leaving the Shield, progressively younger strata are encountered.

The strata are almost wholly of marine origin and were deposited in seas that spread out over a large part of the continent. Differential movements caused these seas to advance and retreat, so that the sediments which were deposited in them vary considerably. There are also local gaps in the sedimentary sequence caused by these movements, but the movements were so gentle that there are no angular unconformities.

The oldest of the Palæozoic formations is the Potsdam sandstone of Upper Cambrian age. It is followed by a thick succession of Ordovician strata. In the Ottawa-Montreal region these beds have a thickness of about 6,000 feet and are the youngest measures there are. They include Beekmantown or early Ordovician dolomitic limestones, Chazy sandstones, shales, and limestones, Black River limestone, and Trenton limestone deposited during the Middle Ordovician, and Upper Ordovician beds made up of the Utica shale, Lorraine shales with limestone and sandy layers, and the Richmond group of shales and limestones. The Lorraine and Richmond rocks are developed chiefly southeast of the St. Lawrence.

West of the Frontenac axis and east of the Niagara escarpment, the middle division of the St. Lawrence Region is also underlain by Ordovician strata. Along the escarpment these beds are succeeded by Silurian measures of which the lowest group is the Medina composed of sandstone, shale, and shaly limestone. These beds are succeeded by shales and limestones of the Clinton group which in turn are followed by the Rochester shale and Lockport dolomite of the Niagara group. Above the Lockport is the Guelph dolomite and this in turn is overlain by the Cayuga