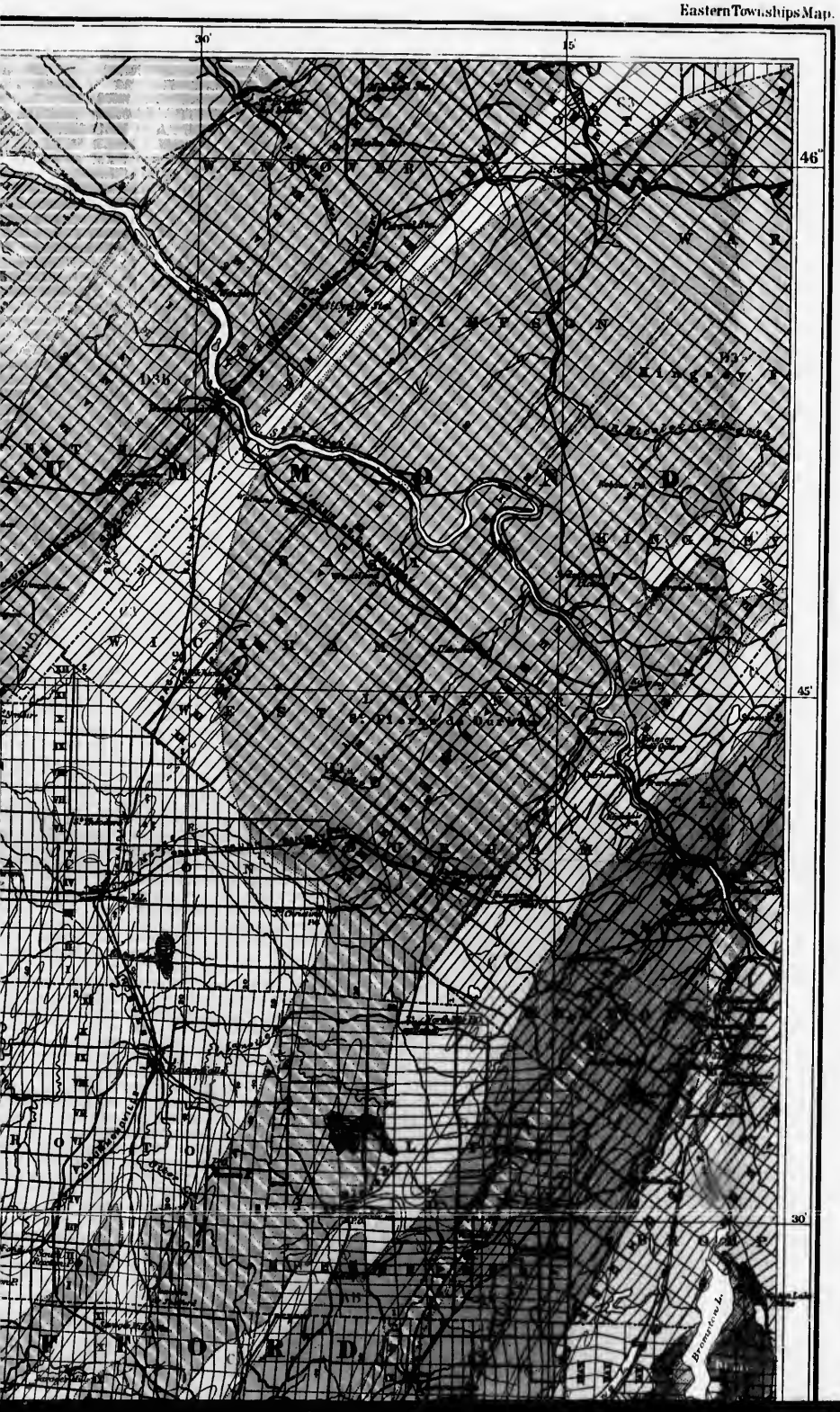
Eastern Townships Map.



NOTE 1.

The Devonian areas in south-western Quebec, recognized by characteristic fossils, are of very limited extent. They are only two in number and are found on the west side of Memphremagog Lake. The largest is on Sargent's Bay, a short distance above the wharf at Knowlton Landing, where *Taonurus cauda-galli, Psilophyton, and Bythotrephis* are found. The other area is near the Mountain House at the Owl's Head Mountain Landing, the fossils from which are chiefly corals. The horizon of the Sargent's Bay rocks is the lower portion (*Cauda-galli* grit) of the Upper Helderberg of the New York scale of formations, while the limestones of the Owl's Head Landing are probably the equivalents of the Corniferous.—(Dana's Manual of Geology, 4th Ed.)

NOTE 2.

The Lower Helderberg of Memphremagog Lake is largely a limestone formation. While not highly fossiliferous at many points, shells and corals occur at various places and clearly indicate the horizon.

The rocks classed as Medina on the map, are reddish shales and sandstones, which as yet have not yielded fossils. They overlie the Lorraine shales and were therefore assigned, by Sir W. E. Logan, to the Silurian system. The formation is difficult to outline, owing to the mantle of drift over much of the area where it occurs, and the boundaries are therefore, to a certain extent, conjectural.

The road from Phillipsburg on Missisquoi Bay to St. Armand Station on the Central Vermont Railway, crosses an almost continuous section of rocks, mostly limestones, which present certain peculiar features. They have been described in the Geology of Canada 1863, pp. 844, 680, under the heading Quebec group (Phillipsburg series). The rocks dip uniformly to the south-east till within a short distance of the railway, when a synocline appears in their upper part. The portion about Phillipsburg and the strata to the north and south, extending along this road for about three fourths of a mile, is regarded as equivalent to the Calciferous (Levis), while the upper portion is supposed to represent the Chazy formation. These rocks, in the vicinity of Bedford, Stanbridge, Mystic, &c., contain local developments of limestone and limestone-conglomerates, from which a great number and variety of fossils have been obtained. It has, however, been found that while certain affinities exist between these and the fauna of the typical Calciferous and Chazy of the Ottawa basin, the fossils as a whole present features markedly distinct. There is also a lithological difference in the strata of the two localities. These peculiarities are supposed to be due to differences in the circumstances of deposition of the two areas, now brought into contact along the line of the St. Lawrence and Champlain fault. This fault extends from Phillipsburg to Quebec and thence eastward, separating the flat-lying formations of the St. Lawrence on the west from the highly inclined strata on the east.

The small outcrops of limestone at St. Helen's Island and Isle Ronde in Montreal Harbour are associated with volcanic breccias, but have yielded a very characteristic fauna indicating their position at the top of the Silurian system.

NOTE 3.

No definite break has yet been found in Canada between the Calciferous formation and the Potsdam sandstone, the passage between the two, both in eastern Ontario and western Quebec, being gradual. After consideration of all the evidence from the stratigraphical and palæontological standpoints, it has been decided to include them in one category as representing the basal portion of the Cambro-Silurian system. The areas of each have, however, been distinguished, where known, by a difference in the barring. Lithologically these formations are entirely distinct from the Levis and upper part of the Sillery formation, (formerly Lauzon), which are supposed to be their equivalents in age, a difference presumably due to different conditions of deposition. The Potsdam sandstone and the Calciferous are also everywhere nearly flat, while the Sillery and Levis are highly inclined, sometimes overturned, and extensively faulted.

NOTE 4.

The Sillery of the North-east map-sheet of the "Eastern Township" series, is divisible into two portions, an upper and a lower, the former of which consists largely of reddish and green shales and greenish sandstones with limestone-conglomerates, the upper part of which is apparently the downward extension of the Levis formation. On the present map the rocks are well seen between Abbottsford and Granby and thence northward for many miles. The lower part of the Sillery is undoubtedly Cambrian and in the St. Lawrence River section contains characteristic fossils, *Agnostus*, etc., at certain points. The highest beds of the Sillery (Lauzon) do not appear in this area and the red and green slates, sandstones and grits of this area are therefore all probably Cambrian. The horizon of the Cambrian rocks on both sides of the Pre-Cambrian of the Sutton Mountain anticline, has not yet been definitely decided owing to an apparent absence of organic remains in the strata. The slates and quartzites at the base, are probably the equivalents of the Georgia series of Vermont (Olenellus zone) while the strata from Frelighsburg to Sweetsburg, etc., probably represent the Upper Cambrian. In the Cambrian of this area are the slate quarries of Melbourne and vicinity, which have been worked for many years, and are of great economic importance.

NOTE 5.

The strata which compose the Sutton Mountain anticline, are believed to be of Huronian age. They undoubtedly underlie the lowest Cambrian. They do not resemble the typical Laurentian gneiss of the Grenville series north of the St. Lawrence river, but are not unlike the rocks which have been described as the "Hastings series" in Ontario, both in the character of the schists and the crystalline dolomites. They contain deposits of copper ore at several points, and the most productive copper mines of the "Eastern Townships" belong to this division. Gold has been reported from the gravels of some of the streams on the west side of the axis in Sutton, but nothing definite as to the value of the deposit has been ascertained. Gold has also lately been found in quartz veins cutting the strata of this series near Dudswell, north-east of Sherbrooke.