

LEGEND

NOTE: - Stippled areas are heavily drift-covered and in them the underlying bedrock is not known. Coloured areas are largely drift-covered, the locations of known areas of outcrop are indicated by crosses (x), small outcrop.

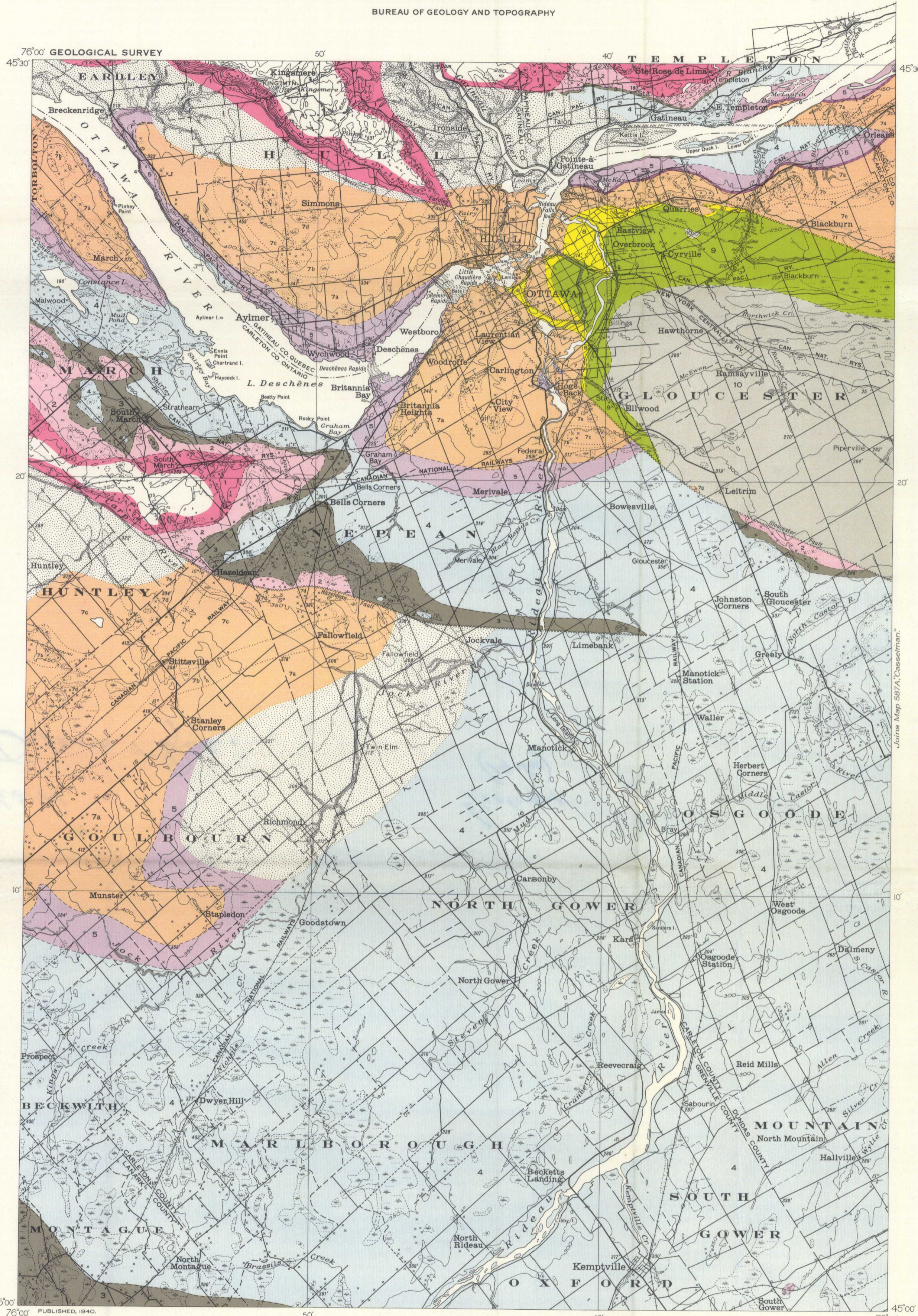
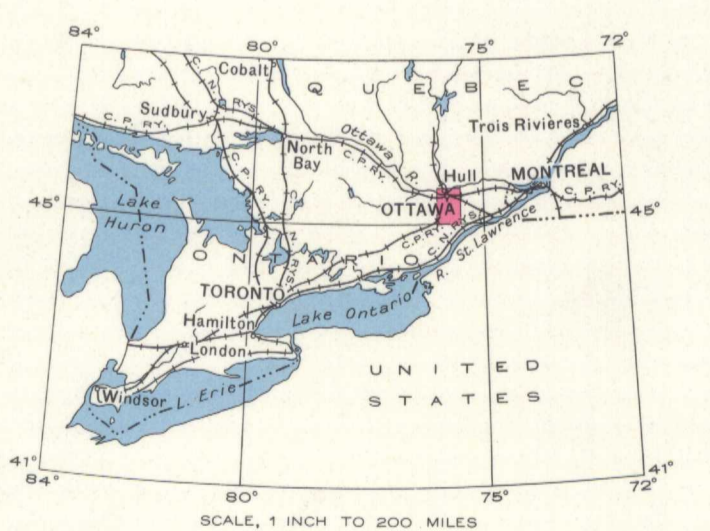
- ORDOVICIAN**
- 10 LORRAINE**
CARLSBAD FORMATION: grey shale, sandy shale, some dolomitic layers
 - 9 GLOUCESTER**
BILLINGS FORMATION: black shale, with a little brown shale
 - 8 COLLINGWOOD**
EASTVIEW FORMATION: dark grey, almost black limestone
 - 7 TRENTON AND BLACK RIVER**
OTTAWA FORMATION: limestone with some shaly partings; in lower part, considerable interbedded shale, some dolomite and, in basal part, some sandstone; 7a, Pamela; 7b, Lowville; 7c, Leray; 7d, Rockland; 7e, Hull; 7f, Sherman Fall; 7g, Cobourg
- PALAEZOIC**
- 6 CHAZY**
ST. MARTIN FORMATION: shale, sandstone, impure limestone, dolomite
 - 5 ROCKCLIFFE FORMATION**: shale with lenses of sandstone
 - 4 BEEKMANTOWN**
OXFORD FORMATION: dolomite and limestone
 - 3 MARCH FORMATION**: interbedded sandstone and sandy dolomite
- ORDOVICIAN OR CAMBRIAN**
- 2 NEPEAN FORMATION**: sandstone
- PRECAMBRIAN**
- 1** Gneiss, quartzite, crystalline limestone, etc.; granite, syenite, etc.

- Heavily drift-covered area.....
- Geological boundary (defined, approximate).....
- Bedding (inclined).....
- Fault (defined, assumed).....
- Provincial highway (with number).....
- Road well travelled.....
- Road not well travelled.....
- Road along county boundary.....
- Road along township boundary.....
- Bush road or trail.....
- Post Office.....
- Quarry.....
- Interprovincial boundary.....
- County boundary.....
- Township boundary.....
- Intermittent lake and stream.....
- Rapid.....
- Dam.....
- Sand.....
- Marsh.....
- Contours (interval 50 feet - but in the hilly area north of the Ottawa River, 100 feet).....
- Depression contour.....
- Height in feet above Mean sea-level.....

NOTE: For details of the Ottawa formation (7), where subdivisions are not shown, see Maps 413A, and 414A, "Ottawa Sheet (East Half and West Half)", scale, 1 inch to 1 mile.

Geology by Alice E. Wilson, 1935, 1936, and 1937.

Base-map prepared by the Topographical Survey, 1939, from Federal Government maps published in 1933, 1936, and 1938. Cartography by the Drafting and Reproducing Division, 1940.



DESCRIPTIVE NOTES

The undifferentiated PRECAMBRIAN rocks (1) consist of crystalline limestones, gneisses and quartzites, of the Grenville series intruded by bodies of granite, syenite and other igneous rocks. The irregularly eroded surface of this complex forms the floor upon which the Palaeozoic strata lie in an almost horizontal position except in immediate proximity to some of the larger faults.

The NEPEAN formation (2) is the oldest member of the Palaeozoic strata and as far as known everywhere underlies the next youngest formation. The Nepean is a thin to thick-bedded, coarse-grained, cream-colored sandstone, weathering grey with irregular brown stains. Where quartz forms the cementing material, the rock is hard with thin bands of pure quartzite. Near the top the cement is calcareous or of iron oxide and the rock disintegrates after long exposure. Since the formation was deposited on an irregular surface it varies widely in thickness; the maximum known thickness in the area is 280 feet. The Nepean has been correlated with the Potsdam of New York and it was assumed to be of late Cambrian age. There is no discernible break between the Nepean and the overlying March formation and, therefore, it is possible the Nepean sandstone is of Ordovician age.

The MARCH formation (3) has an estimated thickness of 25 to 30 feet. It is composed of thick beds of grey sandstone with a calcareous cement, alternating with thick beds of sandy blue-grey dolomite, both weathering a rusty brown. The contact with the Nepean is placed at the lowest dolomitic layer, but it is often difficult to locate because outcrops of the formation in many places are of the resistant sandstone layers which are very similar to the Nepean sandstone. It has been mapped separately because its characteristic features are persistent and it is a water-bearing horizon. The upper part of the March grades into the overlying Oxford and for this reason the formation is considered to be of Beekmantown age.

The OXFORD formation (4) holds a few thin beds but for the most part consists of thick rusty-weathering beds of dove-grey limestone, magnesian limestone and blue-grey, dense dolomite, becoming dark and somewhat argillaceous in the upper part of the formation. In the dolomitic layers irregular cavities 1/2 to 2 inches in diameter frequently are filled with large pink or white calcite crystals. The Oxford has an average thickness of 225 to 230 feet, which increases comparatively rapidly towards the east. The formation contains fossils that indicate its Beekmantown age.

The ROCKCLIFFE formation (5) is separated from the Oxford by a disconformity indicating an erosional interval between the deposition of the Rockcliffe and the Oxford. The Rockcliffe consists of thick beds of grey-green shales containing lenses of fine, grey sandstone. The lenses vary greatly in thickness and extent. The lowest sandstone layer is coarse, and is almost a fine conglomerate where it lies upon the Oxford dolomite. The Rockcliffe has a maximum thickness of 140 to 150 feet, but apparently is much thinner to the west and south. Toward the east the upper part laterally gives place to the succeeding St. Martin. *Camarotoechia plena* and *C. orientalis* occur sparingly in some sandstone beds of the Rockcliffe indicating deposition in late Chazy time. The Lower and Middle Chazy beds of the Lake Champlain area were probably laid down during the erosional interval represented by the disconformity at the base of the Rockcliffe.

A thin, wedge-like layer of the ST. MARTIN formation (6) conformably overlies the Rockcliffe in the eastern part of the area. The formation is composed of bands of easily disintegrated grey or brown shales, loosely cemented grey-brown and grey-green sandstone and impure limestone and dolomite, all weathering rusty brown. Its maximum thickness is 20 feet. The presence of *Camarotoechia plena* indicates a late Chazy age.

The OTTAWA formation (7) succeeds the Rockcliffe, or in the east, the St. Martin, with a slight disconformity which probably does not represent a very long period of time. The formation consists, at the base, of a few feet of brown or locally black shale, grey-brown sandstone and thin bands of limestone. The sandy and shaly beds closely resemble the underlying Rockcliffe strata. These lower beds give place upwards to grey shales interbedded with grey limestone, dolomite and occasional bands of cream-colored comparatively pure sandstone. This assemblage in turn grades upwards into a group of thick beds of pure, crystalline limestones. About 240 to 250 feet above the base the thick-bedded, pure limestones are abruptly succeeded by shale interbedded with thin beds of impure limestone. These are followed by heavier, purer limestone, though occasional shaly partings persist. The formation attains a thickness of approximately 700 feet. Its abundant fossil content indicates uninterrupted deposition from early Black River to the end of Trenton time. The pure crystalline limestones were deposited during late Black River and early Trenton time.

The EASTVIEW formation (8) is composed of rather thick beds of very dark grey, almost black, limestone weathering brown. The limestone is generally comparatively fine-grained but much of it contains large calcite crystals. Toward the top thin layers of brown shale are interbedded with the limestone. The formation is 20 feet thick. Its contact with the underlying Ottawa is nowhere exposed. Its fossil content indicates its Collingwood age.

The BILLINGS formation (9) succeeds the Eastview with no break. The lower 15 feet consists of brown shale like those forming the shaly partings of the upper beds of the Eastview. Within the lower 15 feet the fauna changes from Collingwood into Gloucester. The brown shales grade upwards into dark, almost black, fissile shales having an estimated thickness of 200 feet.

The CARLSBAD formation (10) succeeds the Billings with no discernible break. The formation is made up of grey shale and sandy, rusty weathering shale with interbedded dolomitic layers at some horizons near the top. The upper part has been eroded away, the maximum thickness of the remaining part is about 365 feet.

A heavy mantle of drift consisting of glacial till, marine clay and sands, and recent alluvium conceals much of the Palaeozoic rocks.

MAP 588A
NEPEAN
CARLETON, LANARK, GRENVILLE, DUNDAS,
GATINEAU, AND PAPINEAU COUNTIES
ONTARIO AND QUEBEC
Scale, 1/20000 or 1 Inch to 2 Miles
Approximate magnetic declination, 14° West.

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