

LEGEND

ORDOVICIAN

17 MIDDLE ORDOVICIAN (16-17)
17 OTTAWA FORMATION: grey limestone

16 ROCKCLIFFE FORMATION: olive-green shale with sandstone lenses

LOWER ORDOVICIAN (14-15)

15 MARCH AND OUVRO FORMATIONS: blue, very fine crystalline dolomite

14 NEPEAN FORMATION: yellow and grey, fine to coarse sandstone

Unconformity

PRECAMBRIAN

13 Massive, coarse-grained white granite and white pegmatite; mainly associated with marble and possibly minor white granodiorite (10)

12 Massive, coarse-grained, pink granite and pink pegmatite

11 Mainly massive, coarse-grained monzonite, syenite and syenodiorite

10 Foliated and massive, pink granodiorite

9 Massive, medium- to coarse-grained hornblende metadiorite, which may grade into metagabbro

GRENVILLE SUPERGROUP

8 Hornblende migmatite: mainly intercalated amphibolite and granitic rocks

7 Metagabbro: 7a, dense, massive to schistose, fine-grained, dark amphibolite, possibly equivalent to metagabbro (9)

Layered, medium-grained amphibolite

5 Garnet amphibolite; garnet gneiss and migmatite

4 Medium- to coarse-grained, light grey marble, ls., tremolite marble alternating with well-layered, fine-grained, grey marble

3 Quartzofeldspathic (-biotite) gneiss, distinguishable by rusty weathering and content of pyrite and graphite

2 Biotite migmatite, consisting of interbedded biotite gneiss and granite

1 Quartzite pink to white; minor granite

NOTE: Units 1 to 8 are interlayered

Geological boundary (defined, assumed)

Foliation (horizontal, inclined, vertical, dip unknown)

Lineation (inclined, may be combined with foliation symbols)

Mylonite laminations (inclined)

Minor fold (arrow indicates plunge)

Fault (assumed, from lineaments)

Glacial striae (direction of ice movement unknown)

Esker

Sand and gravel

Gravel pits (active abandoned)

Quarry pit

Mineral occurrence

MINERALS

Chalcopyrite cp Pyrrhotite po

Graphite gf Stone (building) B.st

Mica, apatite ma Stone (decorative) D.st

Pyrite py

Precambrian geology and compilation by E.W. Reinhardt, 1963, 1969, 1972

Paleozoic geology by A.E. Wilson, 1946

Paleozoic compilation by B.A. Liberty, 1963, with minor changes and additions by E.W. Reinhardt, 1972

Geological cartography by the Geological Survey of Canada

Any revisions or additional geological information known to the user would be welcomed by the Geological Survey of Canada

Base map at the same scale published by the Surveys and Mapping Branch, 1969 with minor revisions by the Geological Survey of Canada for this edition

Copies of the topographical edition of this map may be obtained from the Canada Map Office, Department of Energy, Mines and Resources, Ottawa

Approximate magnetic declination 1973, 12°38' West mean annual change 0.0°

Elevation in feet above mean sea level

DESCRIPTIVE NOTES

Maximum relief in the area is about 500 feet, but local relief rarely exceeds 250 feet. Topography reflects bedrock lineage and structure and is divisible into the following types: (1) areas of low relief underlain by the Ordovician strata; (2) low lying areas of moderate relief underlain by Precambrian marble; and (3) areas of greater relief characterized by rounded hills or linear ridges and underlain respectively by massive or layered Precambrian rocks. The greatest concentration of outcrop is in the northern quarter of the map area.

Unit 1, white, fairly layered quartzite (1) is confined to areas within biotite migmatite (2) and its lack of continuity along strike is ascribed to granite emplacement accompanying migration. The biotite migmatite (2) consists of predominant medium-grained biotite gneiss and subordinate biotite-quartz-microcline-oligoclase gneiss that commonly contains muscovite. The composition of the gneiss suggests derivation from a pelitic sediment that has undergone varying degrees of assimilation and granitization, the most advanced stages of which are represented by granitic rocks with biotite schists. Well-sorted, rusty quartzofeldspathic gneiss (3) contains variable amounts of biotite and occurs in contact with marble.

Marble (4, 4a) varies in grain size and sharpness of layering, and is contorted in places. Local occurrences of accessory coarse-grained tremolite are prominent mainly between Lanark and Watons Corners. Other accessory minerals are phlogopite, diopside, graphite, scapolite and chloritoid.

Rocks that are essentially amphibolites have been separated into map units 5, 6, and 7. All have over 40 per cent hornblende and many contain scapolite in association with altered staurolite.

Unit 5 is distinguished by the presence of garnet in amounts up to 20 per cent, and in addition to amphibolite includes a garnet-biotite-quartz-feldspar gneiss. This gneiss is commonly associated with, but not always distinguishable from, garnet amphibolite or its migmatitic equivalent. A hypersthene-hornblende-quartz-plagioclase association was found within the small mass of unit 5 that occurs one mile northwest of Boyd's Settlement. The amphibolite (6) contains diopside in some places. A characteristic biotite gneiss that is particularly well-developed in the eastern part of the area suggests that units 5 and 6 are dominantly metamafic in origin.

Unit 7, a hornblende-rich metagabbro, displays a relic subophitic texture. Fine-grained amphibolite (7a) is probably of igneous origin because in a few places it exhibits textures similar to those in the metagabbro and also because it lacks consistent compositional banding. Unit 6 differs from unit 7a by having compositional banding, hornblende, and less disseminated pyrite.

Hornblende metadiorite and metagabbro (9), which may be garnetiferous in places, varies considerably in both grain size and composition over a few feet. It is intrusive with respect to metadioritic and metagabbroic strata but its relations with granodiorite (10) are uncertain.

The large intrusion of granodiorite (10) that lies north of Clayton has a strong marginal foliation, which is parallel to the layering in enclosing marble and amphibolite. This parallelism of foliation and layering suggests that the pluton is syntectonic.

Garnet and pegmatite (12), which contain minor amounts of biotite as the chief mafic mineral, cut magnetite-bearing monzonite, syenite, and syenodiorite (11) as well as metadiorite (9). The white colour of the granites and pegmatites of unit 13 is probably caused by the reducing effect of marble on finely divided iron oxides within the feldspars. Many small biotite schists and mafite occurring in marble were not mappable.

The Grenville Supergroup (map units 1-8) is divisible into two major lithologic groupings approximately along a line of separation extending northeastward from Lanark. Characteristic lithologic associations west of this line are marble and biotite amphibolite whereas those to the east are marble, quartzite, and pelitic metasediments. Rocks of the eastern group are similar to those found in the Perth and Westport areas to the south and in the vicinity of Kanata to the northwest. Lithologies of the western group are believed to belong to a belt of Precambrian rocks that defines the northward extension of the Care River Syncline. The metamorphism of the Grenville Supergroup within the map area cannot be defined accurately according to conventional facies of regional metamorphic grade. Medium- and high-grade mineral assemblages occur either together or in several localities.

With the exception of the northeastern part, the Precambrian rocks within the map area dip steeply to the southwest. Lineations are few and consist mainly of streaks on foliation planes in the greenish syenite and the layered amphibolite. The complex structure north of Clayton appears to be mainly anticlinal and is flanked on the south by an eastward-plunging syncline that dies out southeast of Taylor Lake. Lineaments, which mainly follow narrow-filled depressions, possibly represent faults. The two northward-trending lineaments north of Clayton probably mark zones of closely spaced joints, as no definite displacements could be observed along them or in fact any other lineaments in the area.

A major angular unconformity separates the steeply-dipping Precambrian rocks from the overlying horizontal Paleozoic strata.

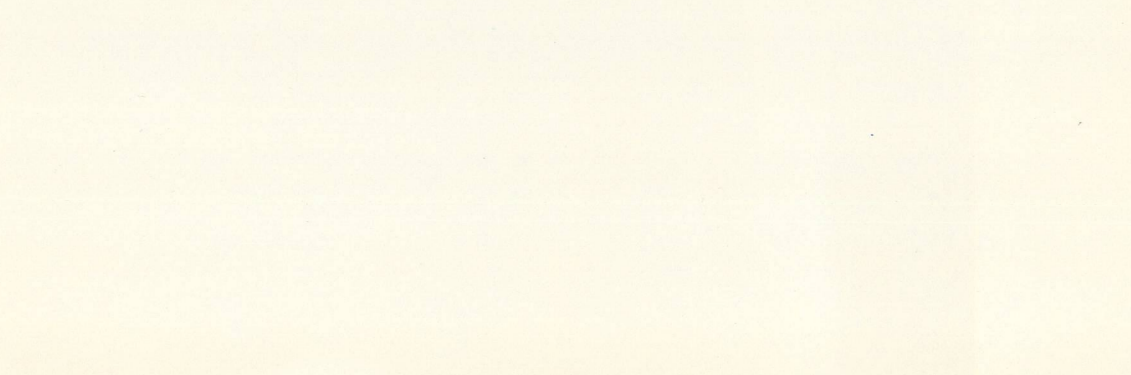
The following description of the Paleozoic formations was prepared by Liberty¹.
The Paleozoic Nepean Formation (14), consisting of fine- to coarse-grained sandstone with minor medium to coarse conglomerates, varies in colour from cream to yellow to grey. Graded bedding, ripple marks, limited mudcracks, lenticular rips, and pyrite have been observed. Thickness varies from 30 to 60 feet, the upper 30 feet of which is an orthoquartzite. Lower strata have a carbonate matrix and consistently fine-grained sandstone. This unit is considered to be Lower Ordovician (Beekmantown) in age by Wilson².

Unit 15 includes strata of the March and Ouvre Formations, as the contact between them is difficult to define in the field. This unit is mainly carbonate; the basal few feet are sandy. It is thick-bedded, blue, very fine crystalline dolomite, weathering rusty and containing geodes of pink and white calcite crystals. When seen, the lowest 30 feet consists of grey sandstone, sandy dolomite, and blue, very fine crystalline dolomite, weathering brown (March Formation). The Ouvre Formation contains spherical masses of cryotrochols. Thickness in the map area is not known; it is 240 feet at Ottawa. It is Lower Ordovician (Beekmantown) in age.

Unit 16, the Rockcliffe Formation, consists of friable, olive-green, indistinct shale with enclosed lenses of sandstone. The lenses vary up to 20 feet in thickness and cover several square miles. The sandstone is fine grained and grey (varies deep red, green shale and dolomite may be thin in thickness, comprises limestone and dolomite with some shale and sandstone. A second member (over 100 feet thick) comprises grey, dove grey, lithographic limestones, with minor dolomite, in thick and thin beds. The third member (25 feet) consists of softer, more thinly bedded limestone, which contains varying amounts of grey, fine-grained, argillaceous limestone, calcarenite, and calcillite. It is very fossiliferous. The section described represents only the lowest 100 feet of the Ottawa Formation (600 feet) and as such is Middle Ordovician (Black River-Low Trenton) in age.

These Paleozoic formations have been described in more detail by Wilson³ and in their Ontario-Quebec context by Calry and Liberty⁴. A principal reference section for the Nepean Formation in southeastern Ontario has been proposed recently by Gregg and Bond⁵.
Attractive white and blue decorative Precambrian marbles occur at two locations (indicated on the map) near Talbot and quarrying at these sites was underway in 1963. Operations were essentially suspended at the southernmost site in 1968 and at the northernmost site in 1970. Work was again resumed at the northernmost site in May, 1972. It is possible that marbles of similar quality are also present farther north near Callaghan. Pink marbles occur in contact with granodiorite (10) northwest of Clayton. The suitability of these marbles for architectural aggregates deserves some consideration. Graphitic marble from a quarry west of Carleton Place (at 8 con. IV, Ramsey township) supplied a lime plant in Carleton Place from about 1860 until the time of closure in 1970. Since 1944 this plant was operated by S.L. Nelson as 'Carleton Lime Products Company' and the product was quicklime for masonry. The remains of smaller lime kilns used by the early settlers can still be found in localities where marble outcrops. Much of the sandstone and marble in the map area is of building stone quality. The area has a good supply of sand and gravel; notable occurrences are 2 miles northeast of Lanark, 2 miles southwest of Almonte, and near the village of Hopetown.

Copies of this map may be obtained from the Geological Survey of Canada, Ottawa.



MAP 1362A
GEOLOGY
CARLETON PLACE
ONTARIO
Scale 1:50,000

Miles 1 0 1000 2000 3000 Metres

Universal Transverse Mercator Projection
© Crown Copyrights reserved

| | | |
|------|-------|------|
| 3107 | 3108 | 3109 |
| 1046 | 1362A | 1038 |
| 3112 | 3111 | 3110 |
| 3105 | 3104 | 3103 |
| 1088 | 1089 | 1087 |

NATIONAL HYDROGRAPHIC SERVICE APPROVED AND ISSUED BY GEOLOGICAL SURVEY OF CANADA MAPS
CARLETON PLACE
ONTARIO

This document was produced by scanning the original publication.
Ce document est le produit d'une numérisation par balayage de la publication originale.