

**A WALKING TOUR OF OTTAWA'S BUILDING AND  
MONUMENT STONES**

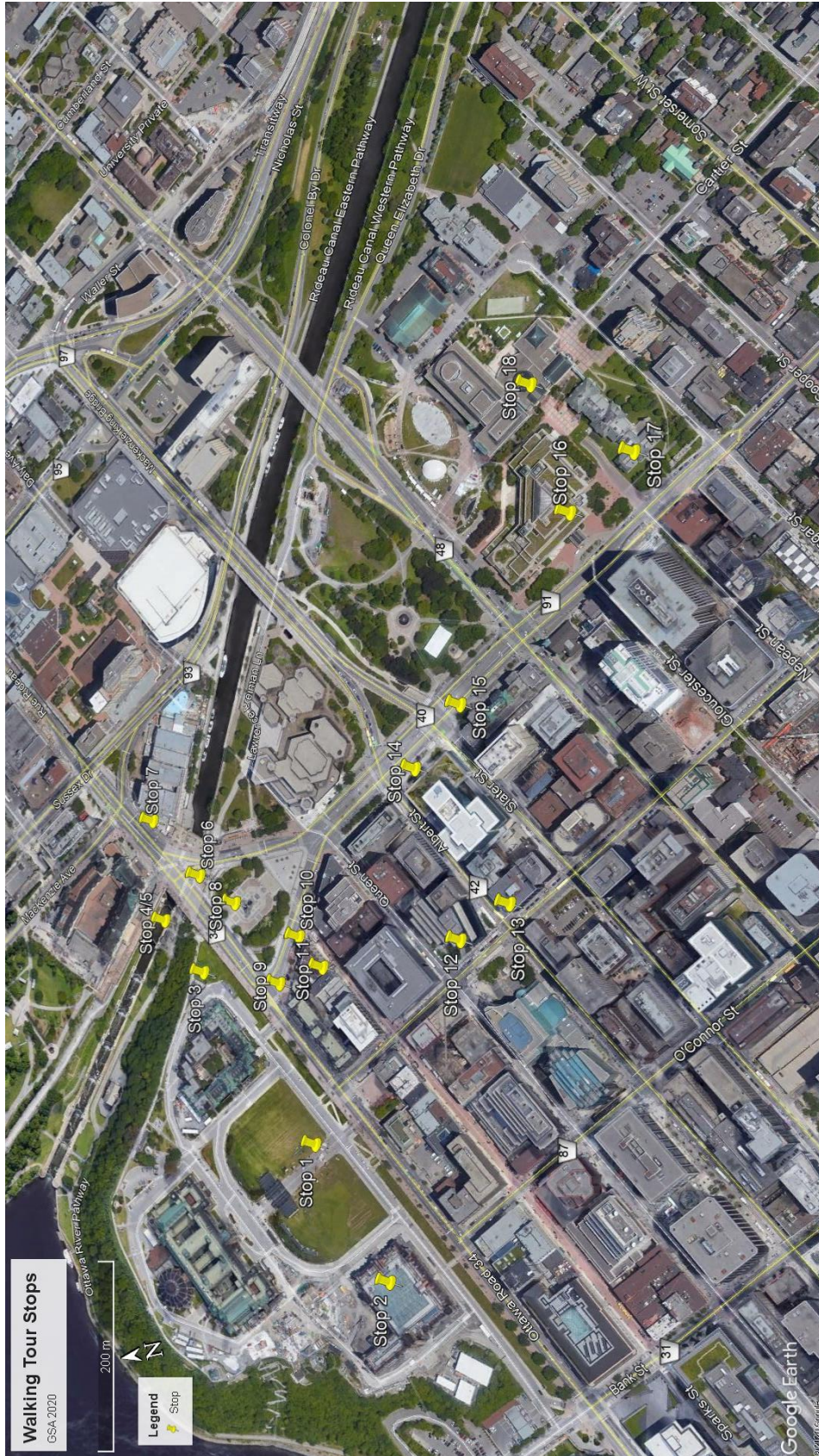
**Geoheritage day 2020**

**by**

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## WALKING TOUR ITINERARY

STOP	BUILDING/MONUMENT	STONE
1	Centennial flame, walkway	Caledonia Red Granite, granitic gneiss
2	West Block	Nepean Sandstone, Ohio (Berea) Sandstone, Potsdam Sandstone etc.
3	Laurier statue	Stanstead Granite
4/5	Commissariat, Lockmaster's Station, Rideau Canal and bridge	Limestone (Lindsay Fm.), slate, Adair Marble, Stanstead Granite, Wallace Sandstone
6	The Valiants Memorial	Gabbroic anorthosite (Black Granite)
7	Senate (Fairmont Chateau Laurier, Rideau Centre)	Indiana (Salem) Limestone, Stanstead Granite
8	National War Memorial and surrounds	Rose-Grey Granite (Rose Cendré), grey granite (Scotstown), white granite (Lacasse), pink granite (Caledonia), pink granite (Laurentian pink), Mackenzie green granite (Scotstown), Riviere-a-Pierre Caledonia granite, Vermillion pink granite.
9	PMO & Privy Council	Miramichi Sandstone, granite
10	Post Office	Queenston Limestone, anorthosite, Stanstead Granite
11	Hope Building	Stanstead Granite, marble, terra cotta
12	Business Development Bank of Canada	Charnokite (anorthosite), gneiss
13	Commonwealth Building	Larvikite (alkali syenite), hornblende granite
14	J.M. Flaherty Bldg.	Jura Stone (mudstone)
15	Lord Elgin Hotel	Queenston Limestone, Deschambault Limestone
16	Ottawa Courthouse and Land Registry Building	Adair Marble
17	Ottawa-Carleton Centre Heritage Building	Gloucester Limestone, slate
18	Ottawa City Hall	Tyndall Stone, Verde Antique, breccias etc.



## PARLIAMENT HILL-

### **Stop 1: Centennial flame, walkway (etc.)**

The Centennial (or Eternal) Flame, lit by Prime Minister Lester B. Pearson on December 31<sup>st</sup>, 1966, is made of **Caledonia Red granite** (*Rivière-a-Pierre, Québec*), and the central walkway leading to the Peace Tower and Centre Block is built with **granitic gneiss** with augen feldspar. The stairs leading to the Peace Tower and Centre Block are Hampstead granite (*Evandale granodiorite; Devonian, New Brunswick*) with dark hornblende.



### **Parliamentary Buildings**

After Queen Victoria chose Ottawa as the Capital in 1857, the Parliament Hill buildings first became the centre of government for the United Provinces of Canada and then, in 1967, the Dominion of Canada. Construction timelines: 1859-1878 Centre Block, Parliamentary Library and Victoria Tower, and 1859-1865 East and West Blocks. The Parliament Buildings were built in the High Victorian Gothic Revival architectural style. In 1916, fire destroyed Centre Block and Victoria Tower; consequently, Centre Block was reconstructed between 1916-1922 and the Peace Tower between 1916-1927. Parliament Buildings roofs were originally covered with dark slate tiles but were replaced by copper panels during the reconstruction.

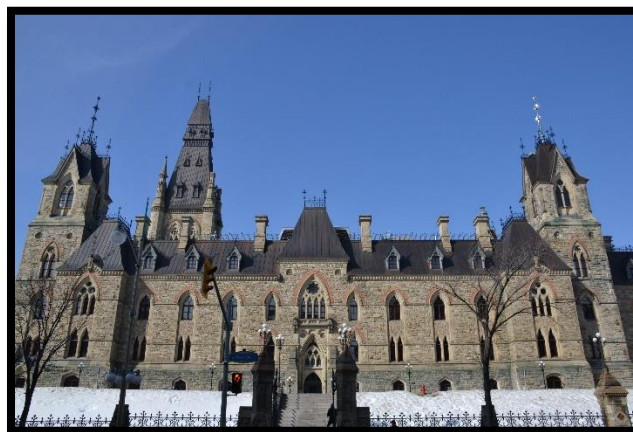
The main building stone used for the exterior façade of the Centre, West and East blocks is the Nepean Sandstone (*Nepean Fm., Cambro-Ordovician, abandoned quarries between Ottawa and Kanata*). Door and window arches and rosettes are red Potsdam Sandstone (*Ausable Fm.*,

*Cambrian, New York*). Ohio Sandstone (*Berea Fm., Mississippian, Ohio*) was used for exterior trim and decoration around windows and doors. Wallace Sandstone (*Boss Point Fm., Pennsylvanian, Nova Scotia*) was used for trim, ventilation shafts, chimneys and penthouses. Portage du Fort marble (*Proterozoic, Portage du Fort, Québec*) forms the Centre Block cornerstone. Gloucester limestone (*Hull Fm., Ordovician, Robillard quarries, Ottawa*) was used to build the flying buttresses of the library behind the Centre Block, and some interior walls. Thankfully the Library of Parliament escaped the 1916 fire.

At least 24 different building stones have been used in the interior of the Parliament Buildings, including: Tyndall Limestone (*Tyndall Fm., Ordovician, Manitoba*), Bath Stone (*Chalfield Oolite Fm., Jurassic, England*), Peerless Indiana limestone (*Salem Fm., a.k.a. Bedford Stone, Mississippian, Indiana, U.S.A.*), Stanstead Granite (*Devonian, Québec*), Tinos #2 serpentine (*Cretaceous, Tinos, Greece*), Battlefield Stone (*France*), Red granite (*Proterozoic, Ontario*), Windsor Green syenite (*Vermont*), Missisquoi marble (*Québec*), Hoidge marble (*Proterozoic, Ontario*) and Tennessee marble (*Holston Fm., Ordovician, Tennessee*).

Unfortunately, due to long-term renovations to the East and Central Blocks, our only option to have a closer view of the parliament buildings is to have a quick look at the exterior of the newly renovated West Block.

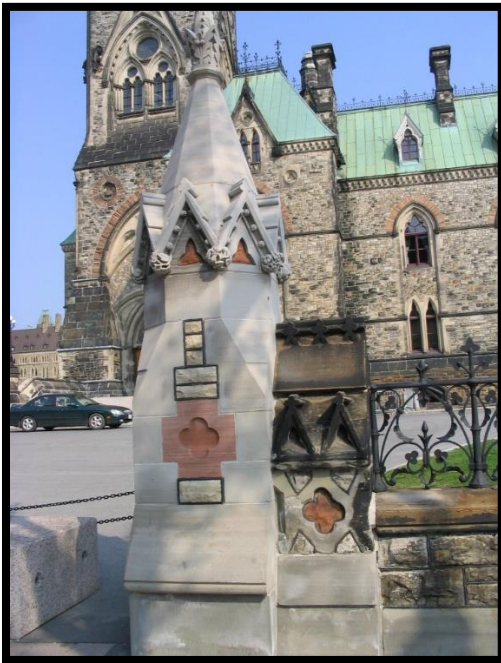
## **Stop 2: West Block**



The West Block façade is built of **Nepean Sandstone** quartz arenite (plus minor March Formation sandstone) with a split faced finish. Softer, more easily carved **Ohio Sandstone** (quartz wacke) has been used for doorway and window jambs, lintels and arches, string courses and wall quoins, some of which have a tooled (droved) and bush-hammered finish; as well as chimney stacks, cornice, spandrels and grotesques / gargoyles. **Red Potsdam Sandstone** has been used to accentuate window arches as well as in mosaics along with irregular pieces of Nepean Sandstone and Ohio Sandstone. Copper staining from water dripping off the copper

roof, and white salt efflorescence can be seen as weathering products on the lower wall face. Stepped entrances about the West Block are cut fossiliferous limestone (perhaps Queenston Limestone). The walkway around the West Block is uniform Stanstead Granite.

The fence around Parliament Hill has a base of split faced Nepean Sandstone and posts consisting of similar Nepean Sandstone, beige rippled Ohio Sandstone, containing oxidized/rusted sulphides, and red quartzose Potsdam Sandstone.



### **Stop 3: Laurier statue**

Sir Wilfred Laurier (1841-1919) was the 7<sup>th</sup> Prime Minister of Canada (1896-1911). The bronze statue has a **Stanstead Granite** plinth (*below*).

### **Stop 4/5: The Commissariat (Bytown Museum) and Lockmaster's Station**

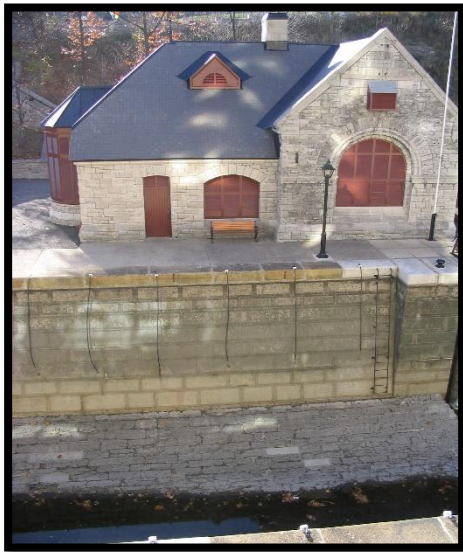
Built in 1827 under the guidance of Colonel By, the **Commissariat** is the oldest standing building in Ottawa (*below right*). Built by Thomas MacKay (who later built himself a house, which became Rideau Hall the Governor General's Residence), the pitch-faced stones are calcite-rich sand (**calcarenite**) and fossil-rich limestone conglomerate (**rudstone**). The limestone was quarried on site at the foot of the locks. The Commissariat was primarily a warehouse for

materials required for the building of the Rideau Canal (1826-1832), but it also had limited living space.

The **Lockmaster's Station** (1884), or Lock Office (*below left*), upslope from the Bytown Museum, is also made from pitch-faced blocks of grey rudstone rich in fossils and lime-mud fragments and has a slate roof.

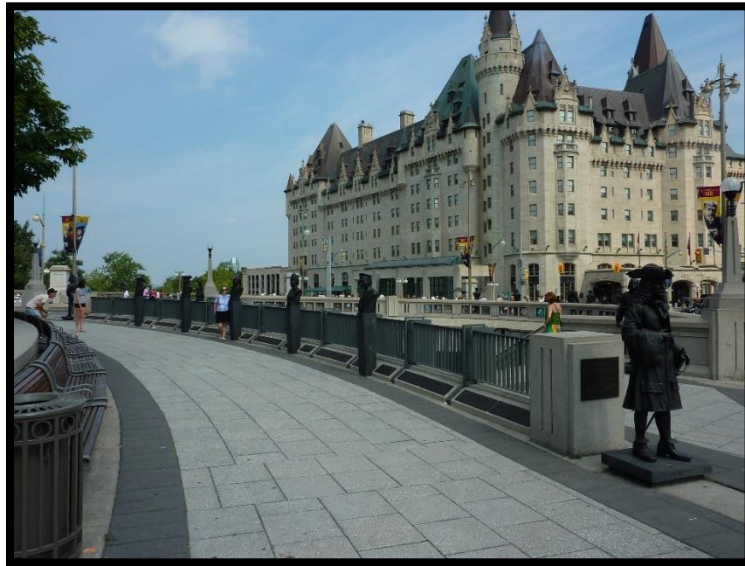
The canal walls, from the Canal Bridge to the Ottawa River, have been restored using **Adair Marble** (*Amabel Fm., Silurian, dolostone, Ontario*) from quarries on the Bruce Peninsula. The original stone that was used to build the canal walls, like the Commissariat and Lockmaster's Station, was quarried locally. For example, local Lindsay Fm. limestone was extracted from the cliffs beside the canal from a quarry now filled in by the Fairmont Chateau Laurier Hotel.

The Canal Bridge over the Rideau Canal locks has grey **Stanstead Granite** towers, between which is carved olive **Wallace Sandstone** railing (feldspathic wacke). The Devonian Stanstead Granite is from quarries in the eastern Townships of Québec near the border with Vermont; the Carboniferous Wallace sandstone is from quarries of the Boss Point Fm. in northern Nova Scotia.



### **Stop 6: The Valiants Memorial / Monument aux Valeureux**

Surrounding the top of the Sappers Staircase in Confederation Square, are 14 life-size bronze statues commemorating heroic people in Canada's history. The Valiants Memorial was unveiled in 2006. The pedestals for the 9 busts and 5 statues (*below*) are black **gabbroic anorthosite**, commercially known as Atlantic Black Granite. The blocks came from the St-Nazaire quarry near Chicoutimi, Québec, established in Mesoproterozoic anorthosite suites.



### **Stop 7: Senate (Fairmont Chateau Laurier, Rideau Centre)**

**Senate** (former Conference Centre, former Union Train Station) 1909-1912, 1973. While renovations to the Centre Block continue, the Canadian Parliamentary Senate is currently housed within what was originally the Union train station. The Union Station (*below*) was erected by the Grand Trunk Railway Company in the Beaux-Arts architectural style. The building façade matches that of the Château Laurier and the Rideau Centre and consists of buff **Indiana** (a.k.a. **Salem Limestone** or **Bedford Stone**) fossil-rich limestone (mainly a crinoidal grainstone) above a base of **Stanstead Granite** (tonalite). The low, separate outer front wall has a granodiorite stone base.

{As mentioned, free guided tours of the interior are available. The lobby has a polished floor and wall base of grey, nodular limestone. Unfortunately, the travertine walls and Corinthian columns have been all but hidden under paint. Marble and limestone ashlar rectangles have been placed in the floor, and large slabs of white marble have been placed directly behind the Speaker's chair and Monarch's throne.}





**Fairmont Chateau Laurier** 1908-1912, 1927-1929. Charles Hays, President of the Grand Trunk Railway, had the luxury hotel built and named it in honour of Sir Wilfred Laurier whose Liberal government enabled the construction of the Grand Trunk Railway. Built in the Château (French Gothic) architectural style, the main building façade is cross-bedded, buff fossil-rich **Indiana Limestone**, with a base of **Stanstead Granite**. It has a steeply pitched copper clad roof with dormer windows (in background of first **Stop 6** photo).

{not part of tour, **Interior**- The lobby floor is beige travertine limestone, as are the stairways near the telephones; the adjacent foyer has beige, fossil-rich limestone flooring. Reception and Concierge desks, and base of nearby walls, are black brecciated 'marble' (actually micritic limestone) laced with white calcite veins. Interior walls are tan fossil-rich limestone with thin red banding (liesegang) and some cross bedding; the eastern corridor is faced with light brown Tyndall Limestone with abundant burrows and cephalopod and gastropod fossils.}

**Rideau Centre.** **Stanstead Granite** base beneath an **Indiana Limestone** façade.

### **Stop 8: National War Memorial**

Built between 1938 and 1939, the National War Memorial was built using 503 tonnes of granite and 32 tonnes of bronze (figures), with a reinforced concrete base (*below left*). The National War Memorial in Confederation Square was originally built to commemorate the Canadians who died in the First World War, but now commemorates all of Canada's war dead. The 23 bronze figures represent the different services from the First World War, which are moving

through the arch from war to peace beneath winged figures representing peace and liberty. The Unknown Soldier sarcophagus (*below right*) is similar to the one at the Canadian National Vimy Memorial in France. In 2000, the remains of an unknown Canadian soldier killed during the First World War was brought from France and laid to rest here.

Many building stones comprise the National War Memorial:

**Rose-grey granite** (*Rose Cendré*) pedestal from Dumas Quarry at Rivière-à-Pierre near Québec City, along with the arch granite, are virtually iron free (less chance of staining). Terraces and walks and grading have seven varieties of Canadian granite, namely:

Grey granite from Scotstown, Québec (curbs and borders).

Lacasse white granite from Beebe, Québec (upper steps and borders).

Pink granite (*Caledonia* or *Rose Cendré*) from Rivière-à-Pierre, Québec (square tile panels).

Pink granite (*Laurentian Pink*) from Guénette, Québec (mosaic work).

Mackenzie green granite from Scotstown, Québec (mosaic work).

Dark pink Rivière-à-Pierre granite (*Caledonia*) (mosaic work).

Pink granite (*Vermilion Pink*) from Vermilion Bay, Ontario (mosaic work).



### **Stop 9: PMO and Privy Council Building**

This Second Empire architectural style building, constructed between 1883 and 1889 using plans drawn by the Chief Dominion Architect Thomas Fuller, represents the first expansion of a growing Federal Government beyond Parliament Hill. The building at 50 Wellington Street currently serves as the Prime Minister's Office and the Privy Council Office. The exterior walls are cross-bedded, coarse olive **Miramichi Sandstone** (*Minto Fm., Pennsylvanian*) from Curryville-area quarries in Albert County, New Brunswick. The stone at the base of the building is bossaged, while the remaining wall stones are cut smooth or, near entrances, have a tooled finish. Local limestone was used for the rear wall of the building. The roof is copper. The window columns on the second to fourth floors are red granite.



### **STOP 10: Post Office**

The central post office was built between 1938 and 1939. The base of the eight-storey, steel-frame building consists of black, **glomeroporphyritic anorthosite** (*below*). Facade above the anorthosite consists of sorted and cross-bedded beige **Queenston Limestone** (bioclastic packstone) containing abundant fossil fragments (bioclasts). The Upper Ordovician Queenston Formation was quarried on the Niagara Peninsula, Ontario. Window and door jambs are grey **Stanstead Granite**. The building has a steeply pitched, Chateau-style copper roof pierced with dormers.

{Not part of the tour, **Interior**- Beige travertine limestone floor. Walls are beige nodular limestone conglomerate, with black fossil-rich limestone along base of the walls, wall columns and counters.}



### **STOP 11: Hope Building**

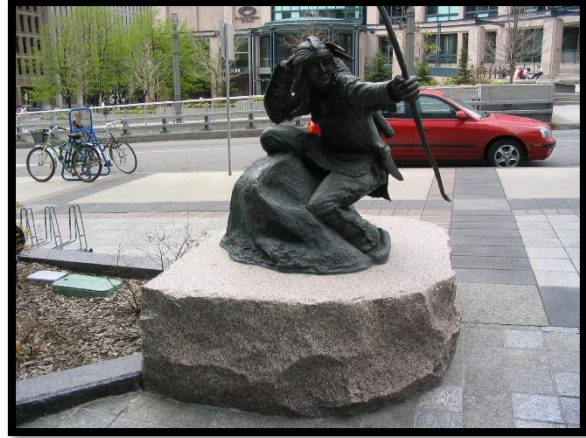
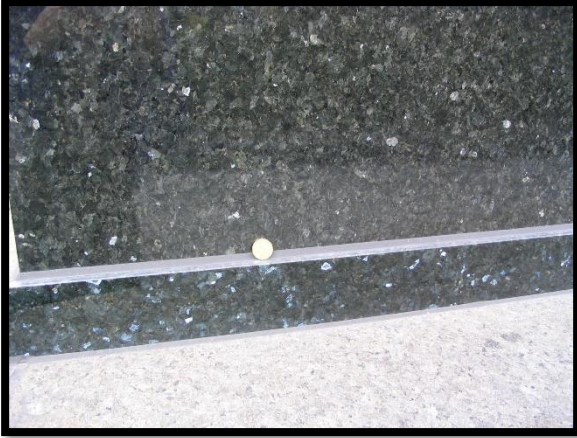
The Hope Building was constructed in 1910 for bookseller and stationer James Hope. Nine storey, steel frame and concrete slab building, with a storefront and façade of finely-crystalline, mica-bearing **Stanstead Granite** with bronze spandrels (*below*). Top story is clad in light grey glazed terra cotta (Doulton potteries, Leeds, England) and has a bronze cornice. Door alcove is walled with white marble.



### **STOP 12: Business Development Bank of Canada**

Lower exterior façade of the building consists of polished, iridescent perthitic feldspar and orthopyroxene **charnockite** (*River Valley Black anorthosite?*, *below left* with dollar coin for

scale). Outside the BDBC building, is an Indian hunter with bow and arrow on a feldspar-rich pink, foliated **gneiss** plinth (*below right*).



### **STOP 13: Commonwealth Building**

Polished, perthitic feldspar and clinopyroxene **larvikite** (*monzonite, Permian, Norway*) along base of walls and square columns and forming a ‘stoneline’ higher up the walls and columns (*below*). The remainder of the walls and columns is polished, grey **hornblende-bearing granite** (*also shown below, above knife blade*).

The interior lobby walls are identical to the outside walls. The lobby floor and outside walkway are unpolished hornblende-bearing granite.



### **STOP 14: J.M. Flaherty Building**

Formally the site of the Lorne Building and, prior to that, the National Galley, the 2014 J.M. Flaherty Building was constructed using **Jura Stone** for the outer façade and inner entrances. The Jurassic limestone (carbonate mudstone) cladding was quarried near Altmühltal, Germany. The beige to light brown mottled limestone contains many well-preserved belemnite and ammonite (*pictured below*) fossils.



### **STOP 15: Lord Elgin Hotel**

Bush hammered pale grey blocks of **Queenston Limestone** (bioclastic packstone) mainly containing crinoid fossil fragments (*below left and right*). The new additions to the hotel (bordering Slater and Laurier streets) have corner blocks and window and door surrounds of light grey honed blocks of fine-grained bedded **Deschambault Dolostone**. The Ordovician Deschambault Formation dolostone (also called St-Marc stone) is quarried at Sant-Marc-des-Carières near Québec City, Québec. The front entrance of the hotel is floored with polished, beige laminated travertine, pink marble and dark green serpentinite.



### **STOP 16: Ottawa Courthouse and Land Registry Building**

White to beige, wavy-bedded **Adair Marble** (dolostone) and blocks of uniform light grey concrete are alternated in horizontal tiers on the façade of this building (*below*). The Adair Marble (dolostone) is quarried in Albermarle Township, Bruce Peninsula, Ontario. Most of the Adair dimension stones are cut and bush hammered; some are roughly polished, including stairs. Adair Marble has also been used along part of the main entrance hallway. The weathered design bosses on the outer façade are concrete. Pinkish grey coarse-grained syenite curb stones border the flowerbeds around the building.



### **STOP 17: Ottawa-Carleton Centre Heritage Building**

Originally built for the Ottawa Normal School in 1875 (soon followed with additions until 1892) this building is now part of Ottawa City Hall and houses the Mayor's Office. The building incorporates pointed Gothic and semi-circular Italianate windows, Romanesque columns and Second Empire roof. The building walls (*below*), fence and posts are split faced grey micritic **Gloucester Limestone** (packstone to rudstone) containing cryptic bedding, stylolites, abundant fragments of fossils and rounded micrite intraclasts. Some blocks at corners and around windows are bush hammered. The roof is pale green slate. Symbolic sculptures (roses, thistles, shamrocks, bearded faces and a lion, child and owl) decorate the drip stones high up on the façade.

Gloucester limestone is a very common building stone used in houses, institutions and churches in the oldest 19<sup>th</sup> century parts of Ottawa. This is in large part because it is locally available, accessible, abundant and thickly bedded. Many quarries were located in Gloucester Township immediately east of downtown Ottawa along Montreal Road. The Upper Ordovician Hull Formation is exposed in a few of these quarries.



### **STOP 18: Ottawa City Hall**

**Tyndall Limestone** (*a.k.a. Tyndall Stone*) comprises most of the Ottawa City Hall façade (built 1986-1990, *below*). The cut and split-faced building stones of Upper Ordovician Tyndall Fm. consists of mottled beige to grey burrowed (dolomitized) and fossil-rich muddy limestone (wackstone). Fossils include gastropods (*Maclurites sp.*), orthocone cephalopods (*below*), calcareous green-algae *Receptaculites sp.* and tabulate corals. Used in many buildings in Ottawa and across Canada, Tyndall Limestone has been quarried around Garson, Manitoba, almost continuously since 1895.



**Interior-** The interior of City Hall contains wall stones of burrowed Tyndall Limestone, polished panels of green serpentinite breccia with calcite veining (*Verde Antique, Ordovician, Vermont,*), and polished, orange-brown to red sedimentary conglomerate (breccia) in a finer gravel to sand matrix. At the base of the walls are wavy-bedded, dolostone blocks of **Adair Marble** containing jagged stylolites. Near the Lisgar St. entrance of the main hall, are polished wall panels of light brown limestone, with clear calcite crystals filling cavities. Polished, dark red to rose **megacrystic syenite** slabs have been used as floor tiles and as pedestals around information boards. Concentric zoning of some of the feldspar megacrysts (Rapakivi-textured) is evident in some polished slabs.



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