

Lab 4: Topographic maps and location – Mount Royal Cemetery
EPSC 240, Geology in the Field
Sept 26, 2018

Due date: Wednesday Oct 3 (Turn in your maps - both scales - and answers to all questions)

Meet: At 1:35 pm in FDA 348, to walk together to the South entrance of the Mount Royal Cemetery (Chemin Remembrance & Voie Camilien-Houde). Otherwise, find your own way up to the South entrance (by bicycle or by #11 bus) by 2:15 pm.

Bring: Clipboard, hardcover field notebook, ruler, protractor. You will check out a Brunton compass for the afternoon, and return it when you are done. Replacement value of a Brunton compass is currently \$400 CAD so do not lose or damage it! Make sure the TAs check your compass back in before you leave.

Wear: Comfortable clothes for hot weather, sun protection (and/or rain protection if it turns out to be rainy), sturdy shoes as there will be a lot of walking.

Note: The cemetery is a public area where people come to walk, cycle, reflect, and to visit the graves of their loved ones. While roaming around and enjoying the scenery and landscape, remember to be respectful of other visitors. Don't yell. Don't leave bags or bikes lying in the road that might obstruct people passing.

Instructions: You will be provided with 2 maps - one showing the topography of Mount Royal, and one showing just the cemetery. For this exercise, you will use these maps to find locations 1-5 and perform tasks there. You will also find landmarks which are not shown on the map, and mark them at their correct locations. Work with a partner to compare your answers as you go, but each person will turn in their own work.

1. Find the 'outcrop' across the street from the cemetery gates. Is this a real outcrop (i.e., are the rocks *in situ*)? Do a brief rock description. Measure the orientation of the bedding. How does this rock compare to the Laval Formation limestones we saw in the first lab (Peel & Pins outcrop)?
2. If you pass any outcrops anywhere in the cemetery (in addition to the specific locations marked on the map) record their location on the map and what rock type they are (limestone, basalt, gabbro, marble).
3. Find location 1 on your map. The nearest headstone belongs to Queenie Elizabeth Pout. Look around and find at least 2 far-away landmarks which you can locate on the smaller-scale map. Landmarks could be: identifiable hilltops or valleys, or other distinctive features of the landscape, road intersections, towers, buildings, etc. Measure the azimuths from Queenie to these landmarks. Plot lines on your map, oriented to the measured azimuths, which pass through the landmarks. Do your lines intersect at your position? If not, try again!

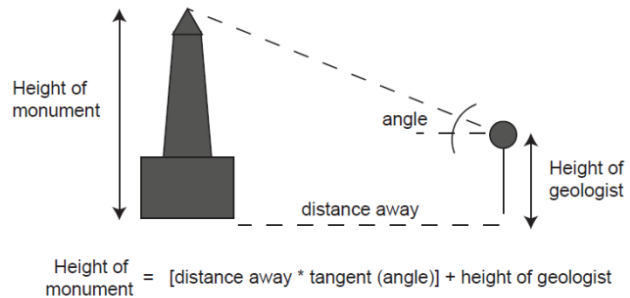


Figure 1: How to measure the height of something using pace and compass

4. Location 2 is not on the map! Location 2 lies at an azimuth of 348° from the west tower and 278° from the south tower. Locate Location 2 and add it to the map. What name is on the gray granite monument at Location 2?
5. Location 3: What is this rock? How does the texture differ from the rock you saw in #1? Do a brief rock description.
6. The topographic contour interval is 10 m, so subtle topographic features on the landscape might not be captured by the resolution of the map. The cemetery was constructed over old stream beds which used to run down the mountain. Use a blue line to mark the trace of a former stream bed on your topographic map that you cross moving from Location 3 to 4. Trace it as far up + downhill as you can follow it.
7. A McGill monument to people who have donated their bodies to science is found about 300 m away, along an azimuth of 288° from Location 3. Find this monument and add it to the map.
8. Location 4: Determine the height of Redpath's monument from base to top, using your Brunton as a clinometer (see pg. 12-13 in Freeman book). Use your pace (calibrated in Lab 2) to measure a distance horizontally away from the monument. Extend the sight, turn the compass on its side edge (as if measuring a dip angle) and point the sight up at an angle from you to the top of the monument. Use teamwork, or the mirror, to level the bar level and measure the angle from horizontal from your eye to the top of the monument. Then calculate the height as shown in Figure 1. Show all measurements and calculations.
9. Start at Location 4. Walk 171 m toward 252° and find a small hill between the roads. Mark the highest point of the small hill on the map with a little triangle and give the estimated elevation at the top. What is the name on the gravestone with the carved palm leaf (resembles the All Blacks' silver fern) near the top of the small hill?
10. Determine the ratio scale of each map: Divide the distance on map (e.g. 2 cm) by the real distance on the ground (e.g. 2 km = 2×10^5 cm) to express the scale of the map as a ratio (in this example, ratio scale = 1:10,000). Add the ratio scale to the legend of each map.
11. Location 5: Do a brief rock description and measure the orientation of any geologically meaningful surfaces you find there. Your nearest headstone is REID.
12. Mark in another stream valley between Locations 5 and 6. Is this one visible on the topographic map?
13. Location 6: Find the Dawson monument. J. W. Dawson was a geology professor and principal of McGill (1855-1893). His monument is placed upon an unusual outcrop. Describe the rock and explain how it is different from the outcrops you have already seen.



