

Tombstone Weathering Lab – January 24, 2008

We will estimate the extent of weathering on tombstones at the Mount Hope Cemetery with two different measures: changes in thickness from top to bottom as measured with a caliper and Visual Weathering Class. We'll focus on one rock type common in the cemetery – a white sandstone. Each group will locate and record data from several tombstones made of **white sandstone with readable dates**. Record the following data for each stone:

Date on the stone

Visual weathering class (see opposite side)

Thickness of the stone at the bottom (in mm)

Thickness of the stone near the top (in mm)

Other observations (surface texture, details of location (i.e. under trees, etc), tilting of stone, etc.)

We'll make the assumption that the two faces of the stone were originally parallel to one another and that weathering (both physical and chemical) has thinned the upper portion of the stone more effectively than the lower portion. After 1 hour in the field, we'll return to the lab and share data between groups. Once you have all the data plot the age of the stone versus difference in thickness from top to bottom on one graph and plot the age of the stone versus Visual Weathering Class on another graph. Paste copies of these graphs in your Research Notebook and answer the following questions.

- 1) Describe in words the results shown in your graphs. What is the rate of weathering?
- 2) Do you think the assumption of originally parallel surfaces of stones is reasonable?
- 3) Does the qualitative visual weathering class compare well to the quantitative measure of change in thickness?
- 3) What factors might account for some of the scatter in the relationship between age and weathering?

We'll have a brief discussion of these three questions at the end of lab. After lab add the following to your research notebook: Write a hypothesis describing how a factor other than age produces differences in the weathering of tombstones at Mount Hope Cemetery. Outline a research project that would allow you to test this hypothesis – What would you measure? How would you measure it? What result would support your hypothesis?

The visual weathering class is a qualitative measure of how weathered the stone is based on the appearance of the lettering. Edges refers to the edges of the letters. Modified from <http://www.envf.port.ac.uk/geo/inkpenr/graveweb/methods.htm>

Visual Weathering Class

Visual Indicators of Class

- | | |
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| 1 | Lettering sharp and distinct. No evidence of change. |
| 2 | Lettering slightly rounded showing evidence of some removal of grains. Still legible and clear, though. |
| 3 | Lettering rounded. Edges clearly being removed and some original edges removed completely. Still legible and clear. |
| 4 | Lettering rounded. All or most original edges removed, lettering still legible, but increasingly becoming indistinct from the surface of gravestone. |
| 5 | Lettering disintegrating. Lettering still just about legible, but now almost indistinguishable from the surface of the gravestone. |
| 6 | What lettering? Lettering virtually disappeared. Need to be able to make out date to be able to date period over which lettering has disappeared. |