University of Wisconsin Lakeshore Nature Preserve Picnic Point
Fieldstone Wall
Key to the Glacial Erratics,
http://www.friendslakeshorepreserve.com/rockwall.html

Built of glacial erratics the fieldstone wall at the entrance to Picnic Point provides visitors, students and others an opportunity to learn about Wisconsin's geology. This key identifies the types of rocks and minerals visible in the roadside face of the wall, and discusses how these fieldstones came to be found in Dane County.

Introduction

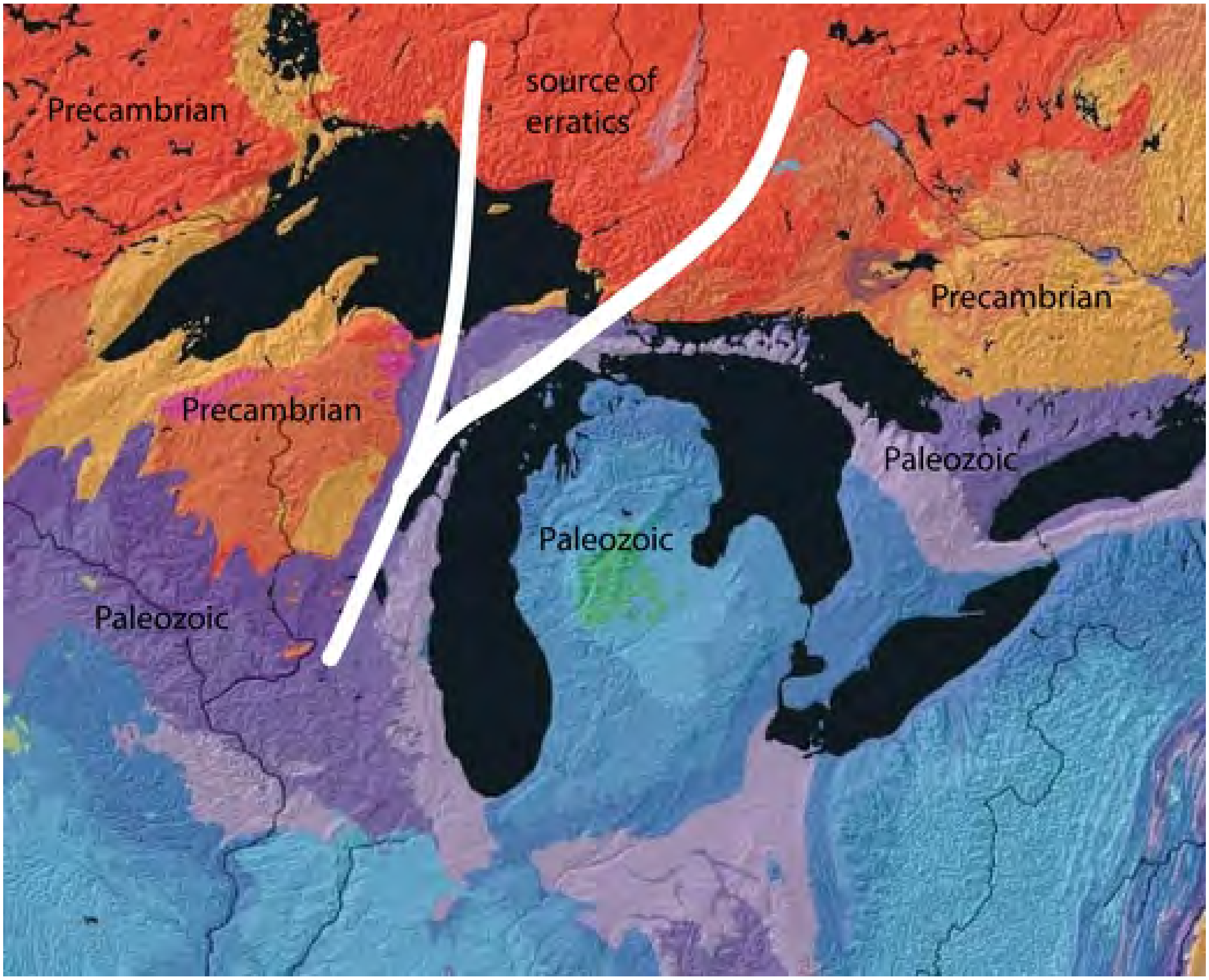
Extending along University Bay Drive on either side of the Picnic Point service drive entrance, a fieldstone wall faces the 1918 Marsh and the west campus medical complex. [43° 5.090'N, 89° 25.732'W]. Parking is available in Lot 130 [Lot 130 map]

In 1925 Edward J. Young purchased the 110 acre R.J. Stevens farm which included Picnic Point. The fieldstone wall and entrance gate were built along University Bay Drive sometime in the late 1920's. According to Alice (Mrs.) Young, the rocks used to build the wall were hand picked from farm fields in the vicinity of Cross Plains. It is our good fortune that the masons who built the wall split the stones to create a flat roadside face, thus revealing the rock's interior characteristics.

Fieldstones are still a common feature in many parts of rural Wisconsin, but less so near cities and towns where they have been gathered and used as building material. That many fieldstones did not come from the bedrock in the location where they were found (i.e. were "erratic") led geologist Louis Agassiz in 1840 to deduce that they had been carried from far afield by glaciers. Once rough pieces of igneous, metamorphic or sedimentary bedrock, the erratics were shaped by weathering and the erosive forces of ice and water into more rounded rocks. Since the late 1800's, geologists from the University of Wisconsin and others have worked to understand how glaciers have affected Wisconsin's landscape, providing insights about where these stones may have come from.

Between 29,00 and 18,000 years ago a glacier (the Green Bay Lobe of the Laurentide Ice Sheet) scoured the landscape of Dane County. Originating in what is now Ontario Canada, the Green Bay Lobe picked up pieces of bedrock from along its path and carried an assortment of them into Dane County where they were deposited as the glacier melted and withdrew. The white lines in the figure below bracket the likely sources of the erratics as they were carried southward by the glacier. As the glacier edge began to retreat from Dane County about 18,000 years ago, the erratics that had accumulated on and at at the front of the ice sheet were deposited near its leading edge in a terminal moraine. In Dane County this outermost moraine, the Johnstown Moraine, runs from Brooklyn in the south through Verona and Cross Plains and to near Prairie du Sac in the north. As the ice sheet withdrew, erratics of all sizes lay across the landscape and many were cleared from farm fields and used for building.

See also: http://wgnhs.uwex.edu/pubs/es043plate01/
http://wgnhs.uwex.edu/pubs/download_es043/
https://lakeshorepreserve.wisc.edu/geology.htm
http://www.friendslakeshorepreserve.com/geology1.html



-Dave Mickelson

Key to the Fieldstones in the Picnic Point Wall

A panorama of the east arm of the wall indicates the location of the section photos that follow - Use distinctive specimens or patterns of stones to help identify where the sections end and begin. Examples of the types of rock and rocks with interesting features are circled and labeled. Following the five wall sections are detailed pictures of some of the more interesting rocks. A glossary of geological and mineralogical terminology briefly explains the characteristics of the rocks, with links to the Wisconsin Geological and Natural History Survey – *Minerals of Wisconsin* database.

Contributors:
Philip Brown, Professor – UW Geosciences
David S. Liebl, Emeritus – UW Engineering
David M. Mickelson, Emeritus - UW Geosciences

University of Wisconsin Lakeshore Nature Preserve
Key to the Picnic Point entrance fieldstone wall
October 2017

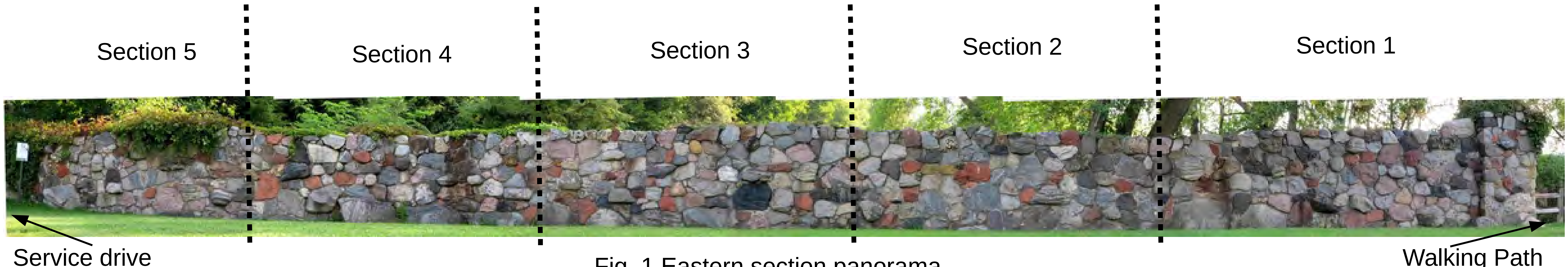
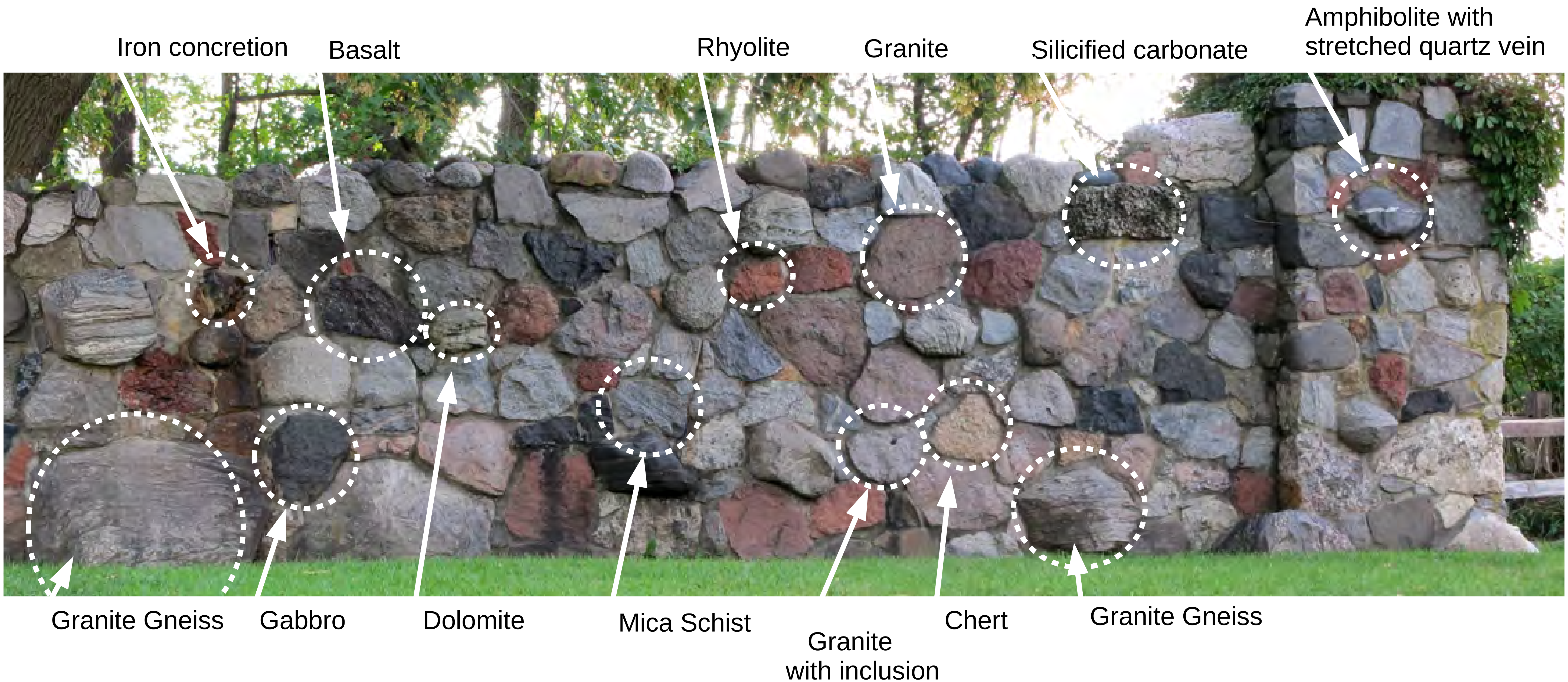
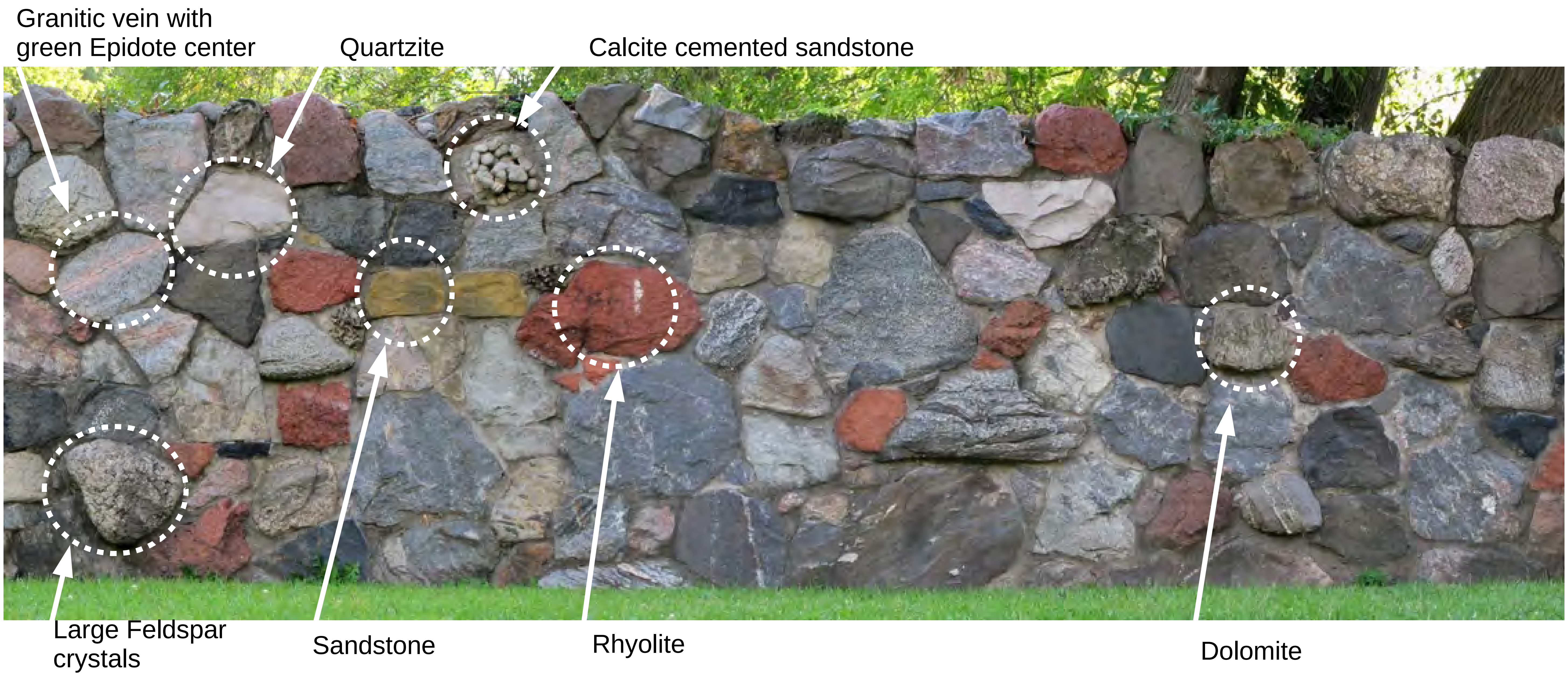


Fig. 1 Eastern section panorama
(as seen from University Bay Drive)

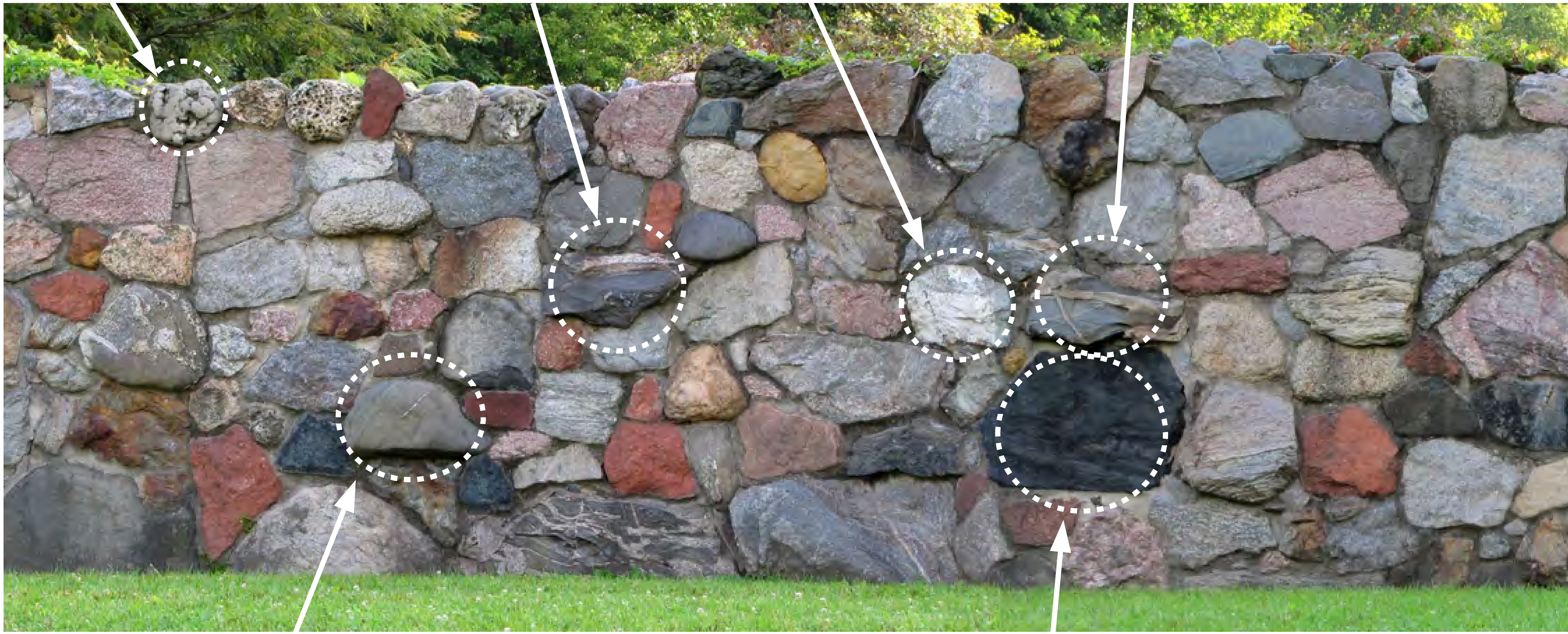
Section 1


Iron concretion
Basalt
Rhyolite
Granite
Silicified carbonate
Amphibolite with stretched quartz vein
Granite Gneiss
Gabbro
Dolomite
Mica Schist
Granite with inclusion
Chert
Granite Gneiss

Section 2

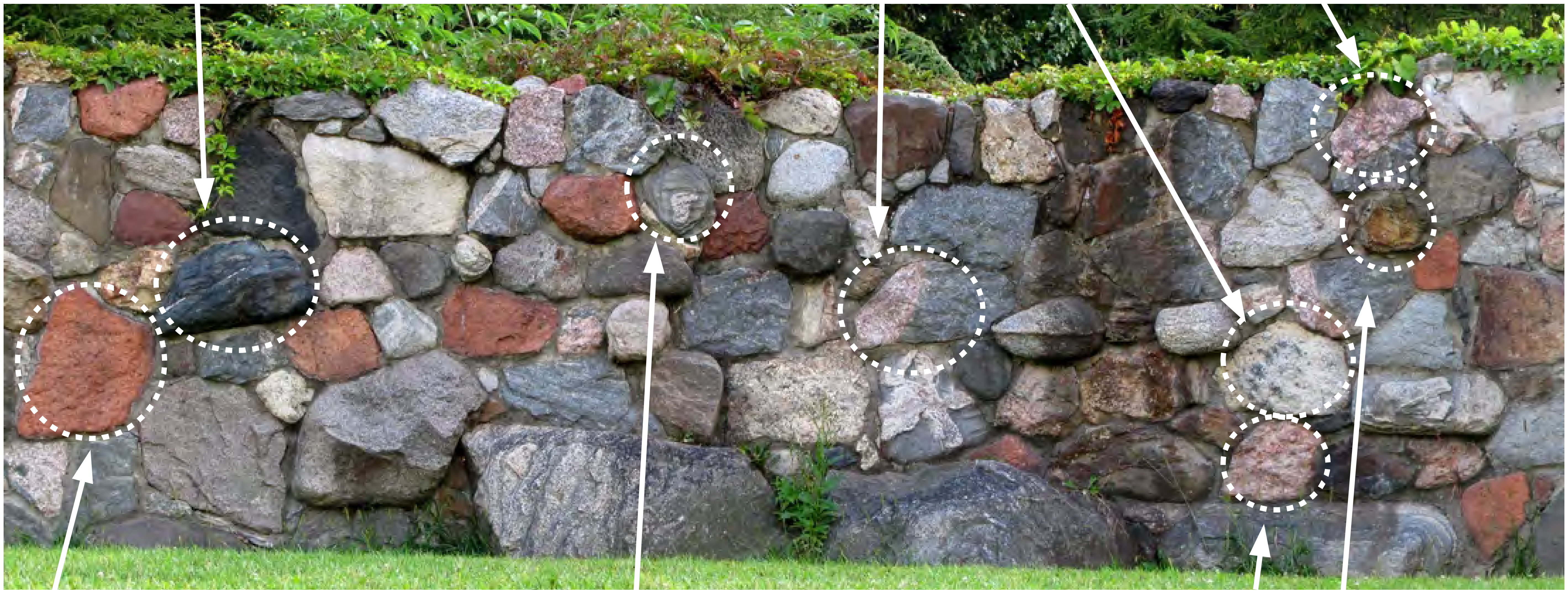

Granitic vein with
green Epidote center
Quartzite
Calcite cemented sandstone
Large Feldspar
crystals
Sandstone
Rhyolite
Dolomite

Section 3



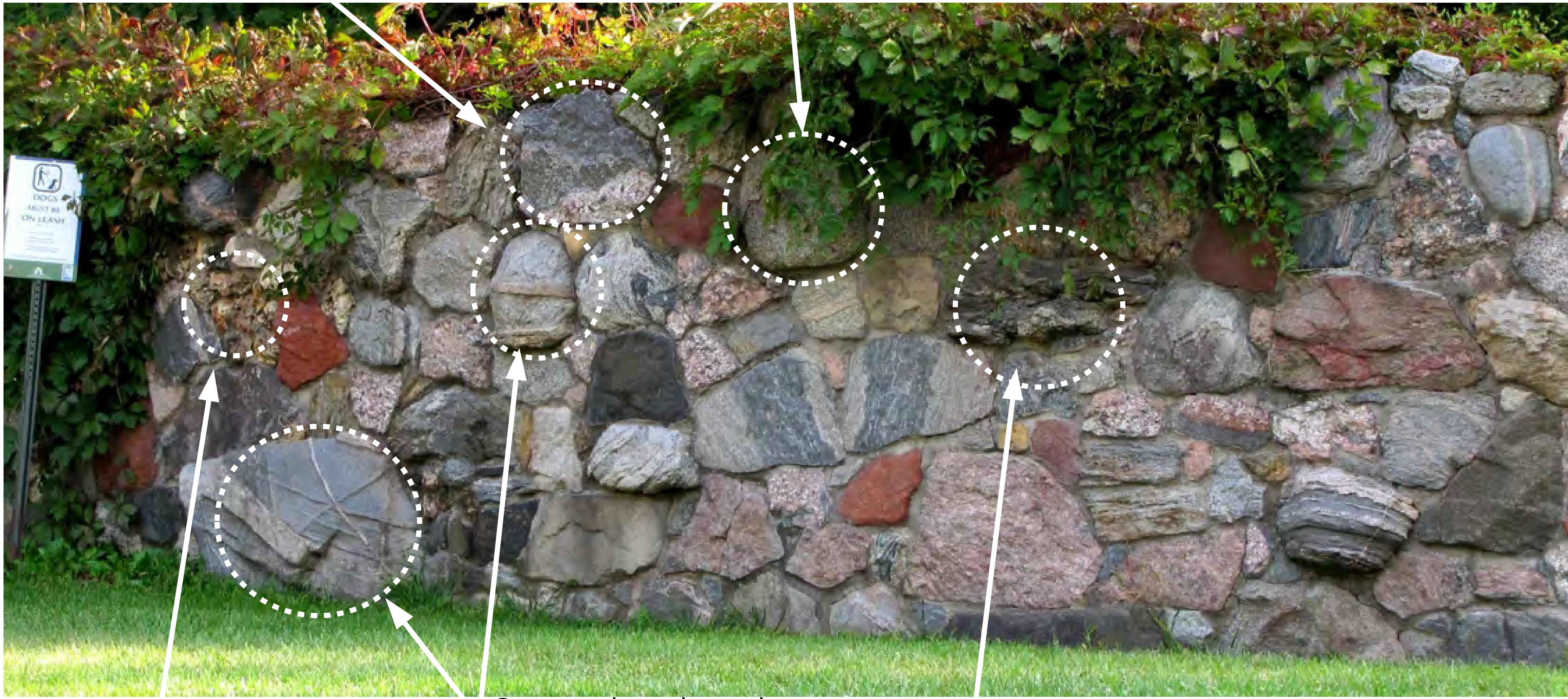
Calcite cemented sandstone
Granite vein
in Amphibole
Igneous Garnets in
Quartz-Feldspar
Differential weathering
Turbidite with glacial
striations and graded
beds (up is to right)
Slate

Section 4



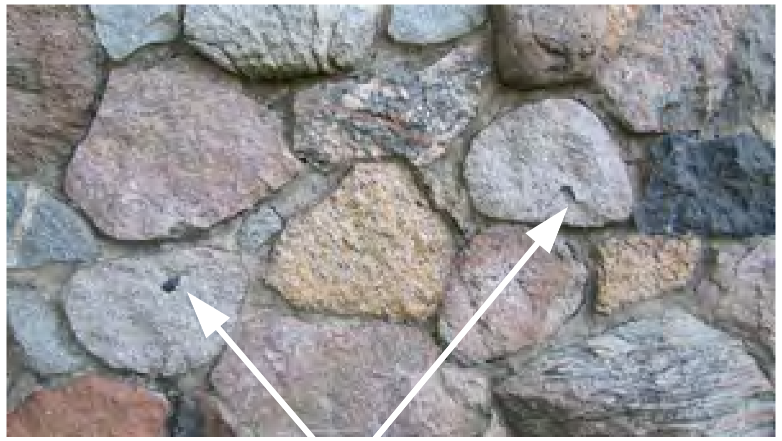
Mica Schist
Granitic vein in Schist
Garnet-Mica clots in granitic rock
Feldspar megacrysts
Rhyolite
Differential weathering
Feldspar megacrysts
Iron concretion

Section 5


Stone has broken across a mica-rich layer
Granite with feldspar megacrysts
Chert
Cross-cutting veins and differential weathering
Chert

Detailed Views

Section 1



Gabbro? inclusion in granite

Section 1

Amphibolite with
stretched Quartz vein

Section 2

Granitic vein with
green Epidote center

Section 3

Granite vein
in Amphibole

Section 3

Turbidite with glacial striations
and graded beds (up is to right)

Section 3

Igneous Garnets in
Quartz-Feldspar

Section 4

Feldspar megacrysts

Section 4

Garnet-Mica clots
in granitic rock

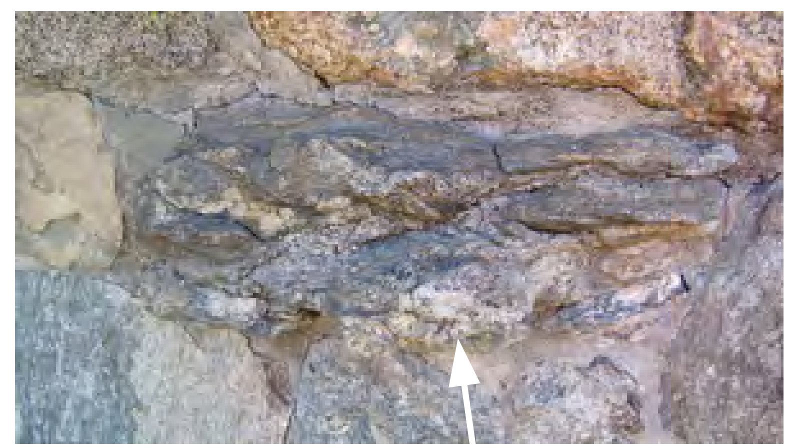
Section 4

Granitic vein in Schist

Section 5

Stone has broken
across a mica-rich layer

Section 5



Chert

Section 5

Cross-cutting veins and
differential weathering

Section 5

Chert

Term	Description [Dates in Ma (= million years ago) are for these samples]
Igneous	Rocks and minerals solidified from molten magma.
Basalt	Dark, finely crystalline, silica poor, formed from magma cooling rapidly at or near the Earth's surface in massive flows, dikes or sills. Also called "trap rock". 1100-3000Ma
Gabbro	Dark, coarsely crystalline, silica poor, solidified slowly within the Earth. Similar in composition to basalt – original mineralogy feldspar + pyroxene. 2500-3000Ma
Rhyolite	Light colored, finely crystalline (or porphyritic), silica-rich, formed from magma cooling rapidly at or near the Earth's surface. 1100 Ma
Granite	Light colored, coarsely crystalline, silica-rich with a wide variety of colors and textures. A common igneous rock in the continental crust.
Sedimentary	Rock formed from the consolidation of layered sediments, fragments of other rocks, plant and animal residues or chemical precipitation.
Chert	Hard, extremely fine-grained quartz (SiO_2). Formed as deposits in limestone and dolomite, and may appear as nodules or in beds. Flint is a variety of chert. 480Ma
Dolomite	A common carbonate rock primarily composed of the mineral of the same name. Generally formed by partial replacement of calcite in limestone, forming dolomite. Local bedrock visible on top of Eagle Heights Woods. 480Ma
Sandstone	Visible grains of quartz cemented together by silica, calcite or iron oxides. Hard to soft and friable, it may also contain feldspar or mica, and is found in a wide range of colors. Originally deposited by either water or wind. Local bedrock visible at the water line at Raymer's Cove. 490-500Ma
Turbidite	Sediment originally deposited by underwater slumps or landslides. The resulting layers vary (grain size, composition) with distance from source. 1800-2300Ma
Metamorphic	Rocks that have been modified from their original type (igneous or sedimentary) by heat, pressure, and fluids deep in the Earth's crust.
Amphibolite	Formed from igneous rock (e.g. basalt), typically dark and coarse textured.
Gneiss	Formed from both igneous and sedimentary parent rock. Characterized by coarse-grained layers composed of different minerals that may be folded. 2500-3000 Ma.
Quartzite	Hard, quartz-rich rock (originally sandstone) fused with silica by heat and pressure. Commonly white-gray to red-purple.
Schist	Formed from a variety of source rocks and minerals. Coarse-grained with visible crystals and easily split especially along mica-rich layers.
Slate	Formed from clays and shales. Dark, fine grained and layered, easily split into sheets.
Minerals	Natural inorganic elements and compounds as crystals formed by geologic/geochemical processes. Most rocks are composed of minerals.
Amphibole	A group of closely related rock-forming silicate minerals such as Hornblende. See also: http://wgnhs.uwex.edu/minerals/hornblende/

Calcite	A form of calcium carbonate ($CaCO_3$), usually milky white to clear. A common component of sedimentary rock, it is much softer than quartz. See also: http://wgnhs.uwex.edu/minerals/calcite/
Dolomite	Calcium-magnesium carbonate ($CaMg(CO_3)_2$), usually translucent white. See also: http://wgnhs.uwex.edu/minerals/dolomite/
Epidote	A light to dark green silicate mineral that can form hydrothermally in metamorphic or igneous rocks. See also: http://wgnhs.uwex.edu/minerals/epidote/
Feldspar	The most abundant group of minerals in the Earth's crust. Crystals may be white to pinkish amber and fracture to rectangular form. See also: http://wgnhs.uwex.edu/minerals/potassiumfeldspar/
Garnet	A group of silicate minerals. Hard, brittle, lustrous and transparent, commonly red.
Mica	A group of silicate minerals that split cleanly yielding sheets or plates. Lustrous and transparent to black.
Pyroxene	A group of closely related rock-forming silicate minerals such as Augite. See also: http://wgnhs.uwex.edu/minerals/augite/
Quartz	One crystalline form of SiO_2, clear to milky, white to black and very hard. See also: http://wgnhs.uwex.edu/minerals/quartz/
Silica	SiO_2 is found in several crystalline forms. Term is also used to refer to relative amount of silicon found in magmas and igneous rocks (e.g. silica-rich).

Other Terms

Cross-cutting veins	Veins that intersect one another can be used to determine relative ages of vein filling events. May be accentuated by differential weathering.
Concretion	Formations superimposed on the host rock, cemented by silica, carbonate or iron oxides that resist weathering, thus revealing odd shapes and textures as the surrounding softer material is weathered away.
Differential weathering	Removal by physical or chemical processes of components of a rock by preference to their hardness or chemical reactivity, resulting in an uneven surface.
Glacial striations	Scratches or other marks created on either bedrock or stones by the forces of moving ice sheets. In bedrock outcrops these striations indicate the direction of ice movement.
Graded beds	A layer of sedimentary rock (e.g. turbidite) where the particle size in a layer ranges from coarse at the base to fine at the top of each layer (bed).
Inclusion	A fragment of an older rock incorporated in an igneous rock.
Porphyritic	The texture of igneous rocks that have larger crystals surrounded by tiny crystals (or even glass).
Silicified Carbonate	Rock that has been altered by increasing the amount of silica (and consequently increasing the hardness).
Vein	A fracture in rock that subsequently fills with one or more other mineral(s).

References:

Glossary of Geology - 5th Ed., American Geosciences Institute, 2011
Smithsonian Handbook of Rocks and Minerals, Smithsonian Institute, 2002
Cambridge Guide to Minerals Rocks and Fossils, Cambridge University Press, 2001