St Mary's Cemetery

Glacial Erosion

- Polished on front side
- Glacial striations (scratches) on top

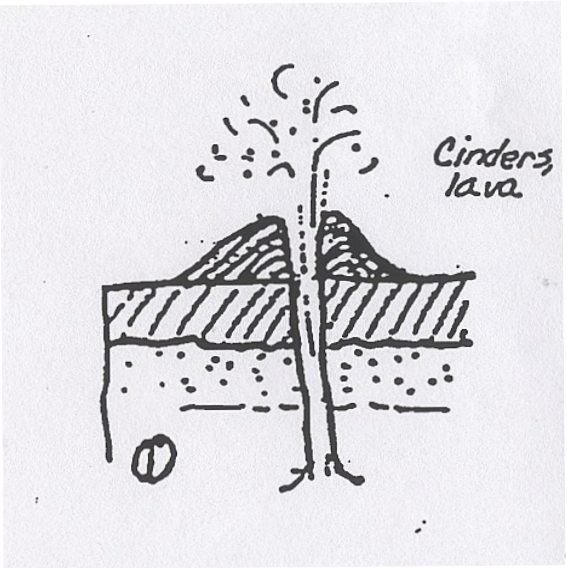
Weathering

- Water channel in the rock – mechanical weathering
- Some rocks eroding faster than others – mechanical weathering

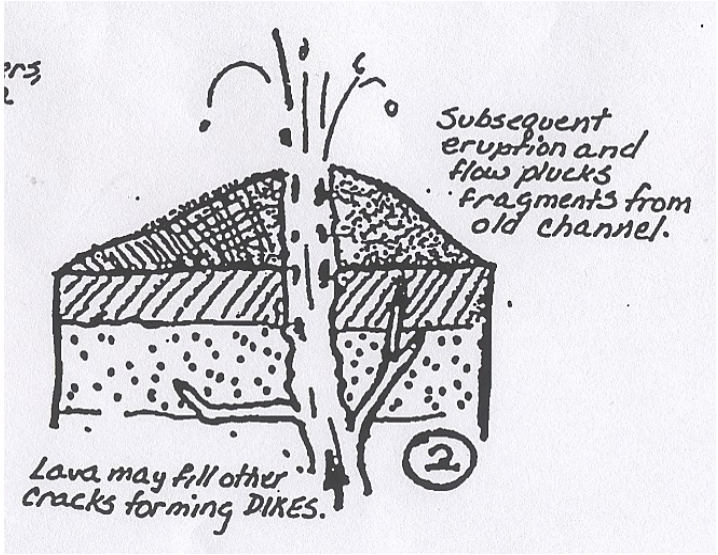
Formation

- Over 580,000,000 years old
- Chimney of a volcano
- Intrusive Igneous
- Volcanic breccia – pieces of bedrock stretched and pulled
- Quartz intrusion

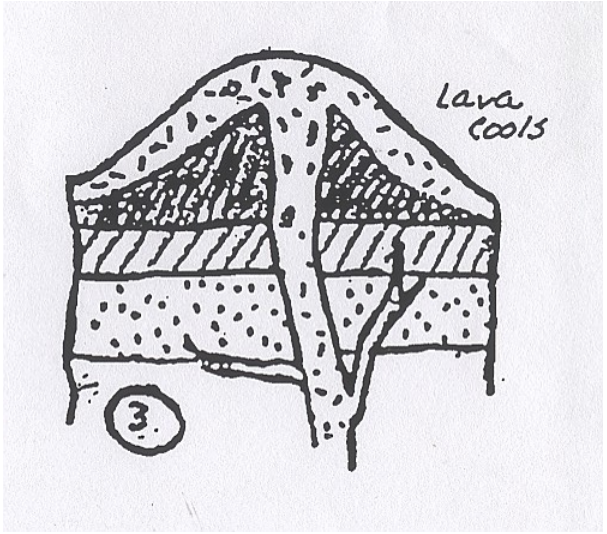
Approximate GPS Location: 36 Hunnewell St, Wellesley



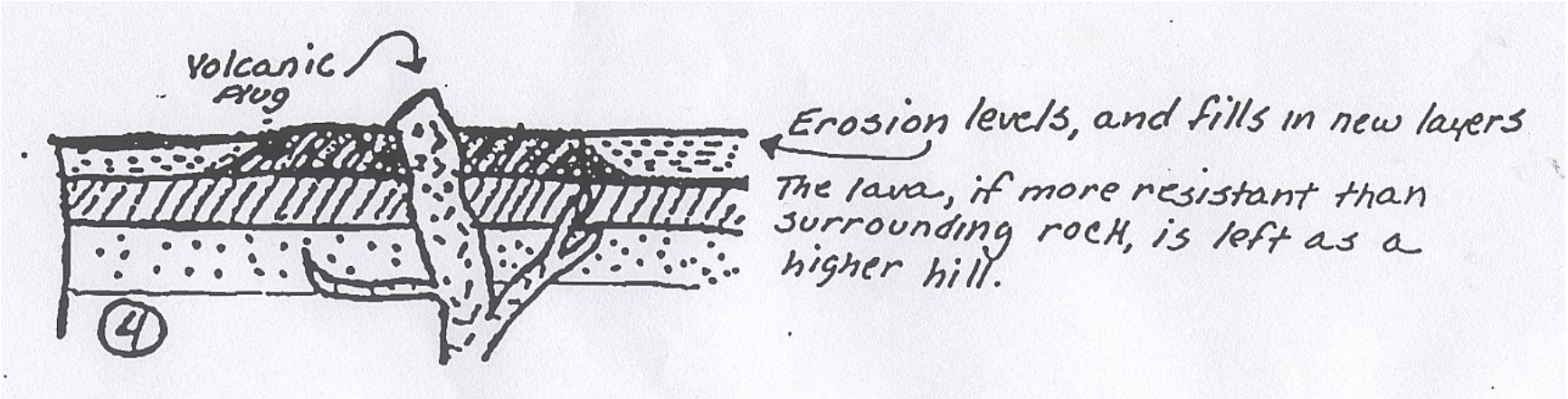
During a volcanic eruption lava moves up through a crack in the bedrock.



Pieces of the surrounding bedrock get broken off and swept up in the lava flow. The breccia pieces get heated resulting in stretching and pulling.



Eventually the lava cools with the older bedrock still embedded in the rock.



Over time the volcanic cone erodes away. The hardened lava is more resistant to erosion so it is left as a higher hill or protrusion. Rock that cooled below the surface has become exposed.

Longfellow Pond

Esker

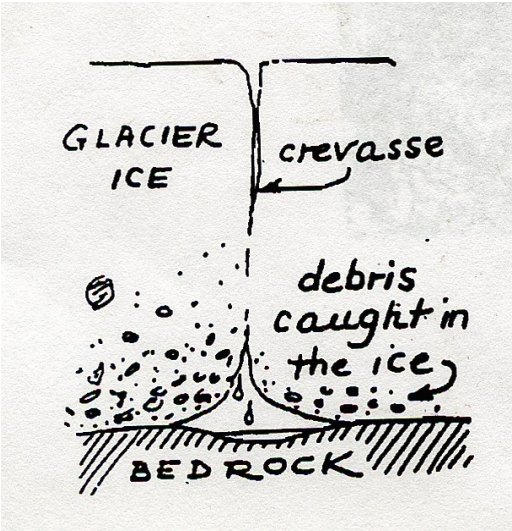
Formation – Erosion & Deposition

- Glaciers in NE – 18,000-22,000 years ago
- River under the ice
- Stones of different sizes deposited by the river
- Ice melted away leaving a rock filled “tunnel”

NOTE: Follow the green arrow to the top of the esker

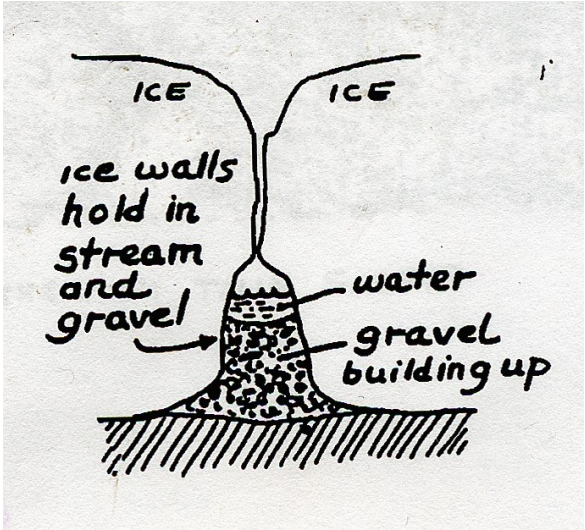
Approximate GPS Location: 217 Oakland St, Wellesley

Eskers



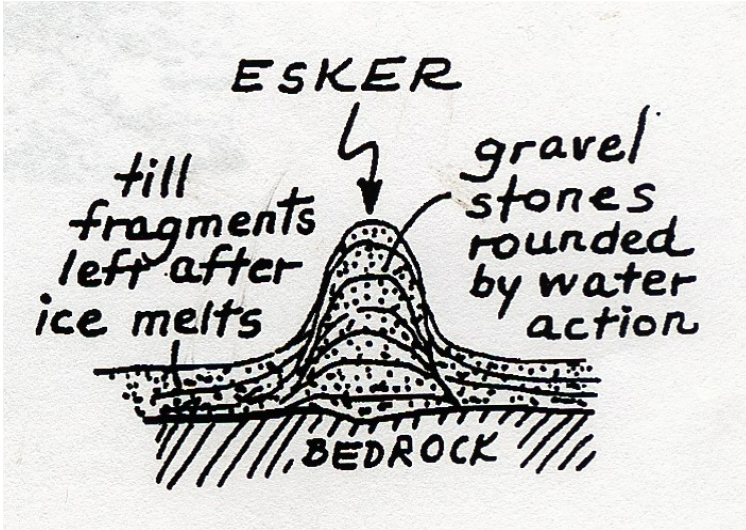
A crack forms in the ice and melting water drips down.

A stream develops and runs through the tunnel carrying rocks of different sizes.



Some years it freezes, other years it thaws.

More rocks are carried along or dropped in the streambed. Water flows on top of the deposited rocks and the cavity gets higher.



In time, the glacier melts above the tunnel. Then the sides melt leaving the rocks dropped by the stream.

It forms a giant ridge.

Kelly Field

Glacial Erratic – Fairy Rock

Glacial Erosion & Deposition

- An erratic is a rock that is different in size and type than rocks native to the area
- Carried here by the glacier and left when glacier melted

Weathering

- Differences in appearance of the rock

Formation

- Igneous Intrusive Rock
- Large feldspar crystals – slow cooling
- Backside has an intrusion (diorite?) with a quartz intrusion within it
- Granite oldest, then dark rock, then quartz

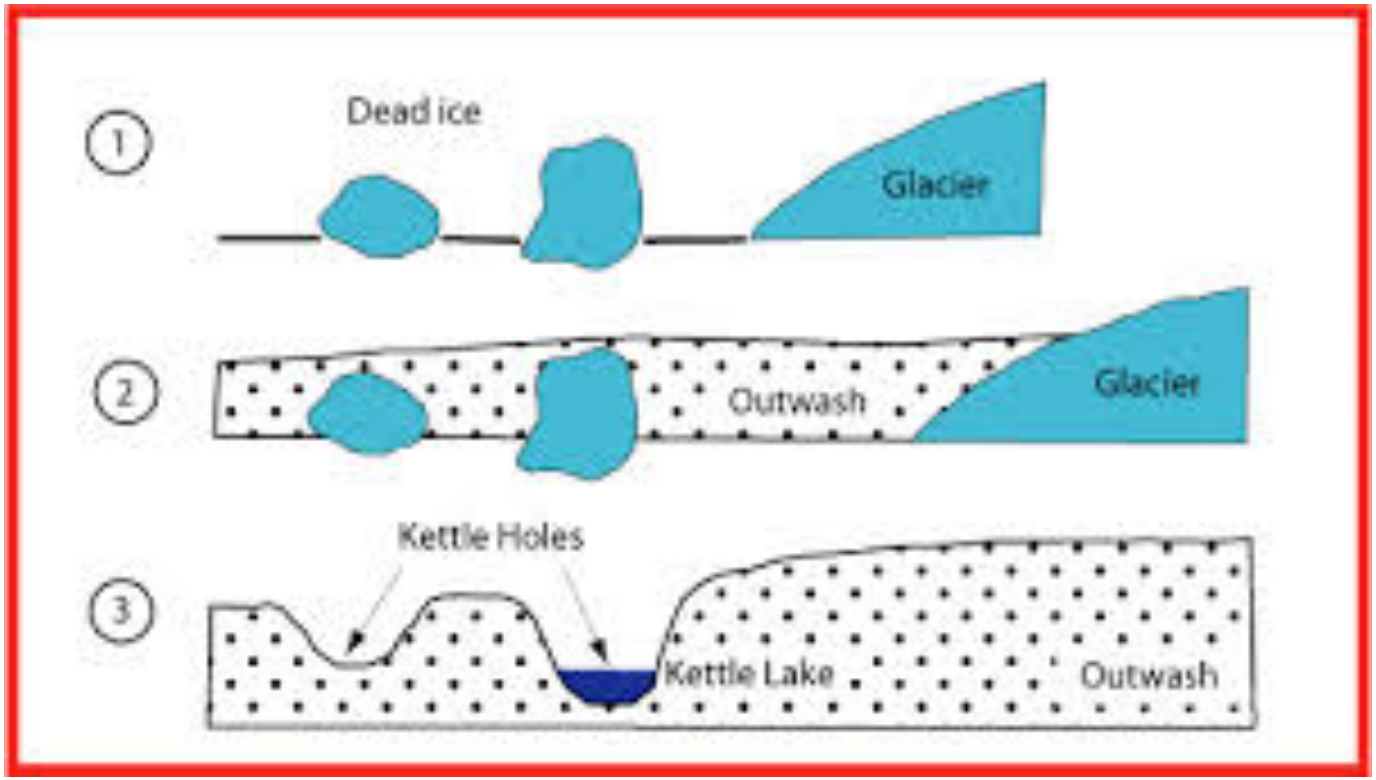
Kettle Hole

Formation – Deposition

- Glaciers in NE – 18,000-22,000 years ago
- When glaciers melted chunks of ice broke off
- Gravel, stones, debris deposited by water run-off
- When ice melted, a depression was left

Approximate GPS Location: 51 Elmwood Rd, Wellesley

Kettle Holes



Blocks of ice break off from the glacier.

As the glacier melts, the melted water carries sand, gravel and rocks (outwash) that flows and settles around the ice block.

The block of ice can get covered with sand and debris. Eventually the ice block melts and the debris settles into the hollow.

Kettle Holes can be as big as lakes, or just small hollows that fill with water only after a very snowy winter.

Devil's Slide

Glacial Erosion

- Polished on front side
- Glacial striations (scratches) on top
- Plucking on backside

Weathering

- Trees growing in the rock – mechanical & chemical weathering
- Lichens release acids - chemical weathering
- Rocks breaking off backside – mechanical weathering

Formation

- 600,000,000 years old
- Intrusive Igneous
- Diorite intrusion into granite

Approximate GPS Location: 8 Greenwood Rd, Wellesley

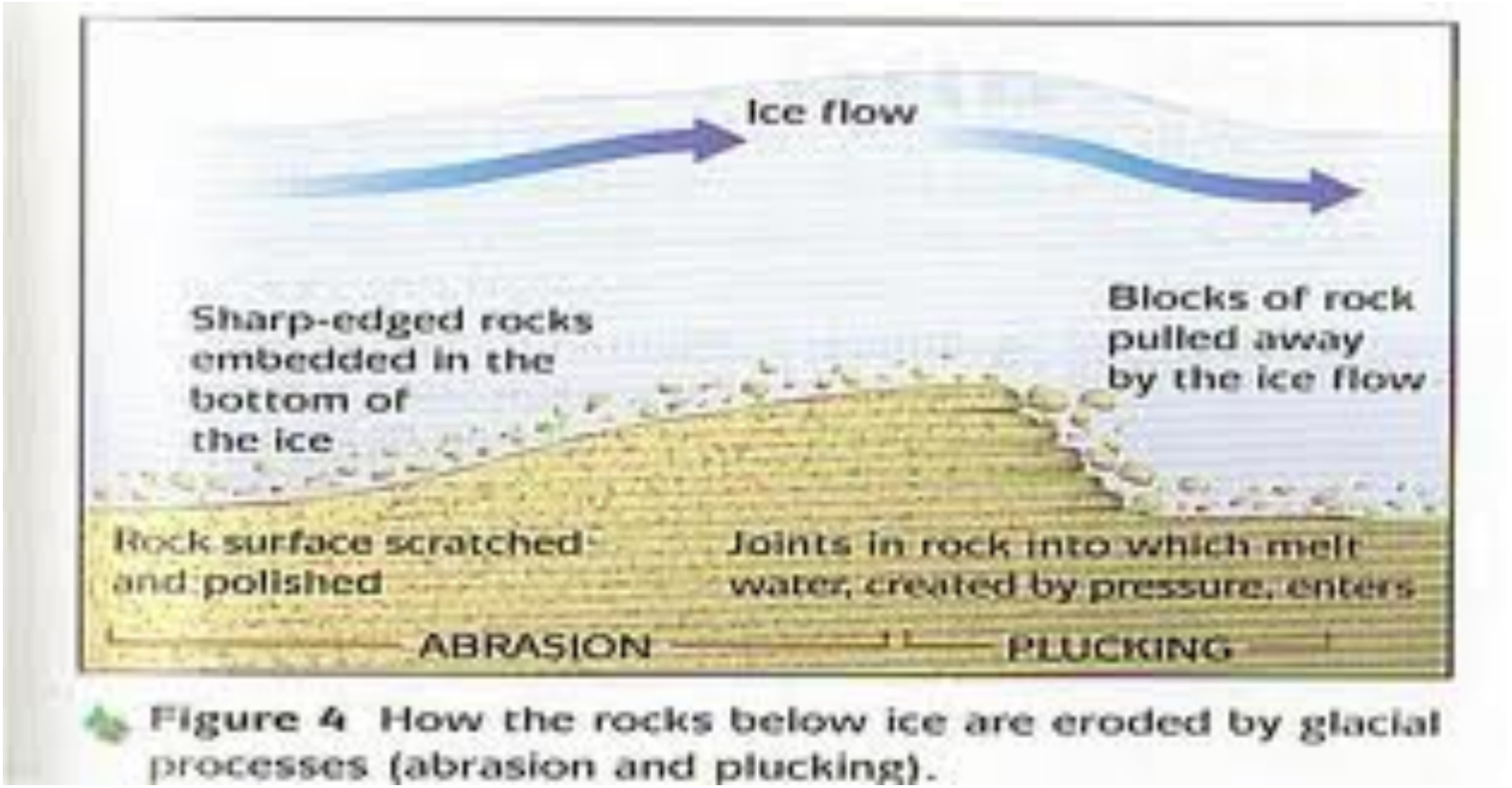


Figure 4 How the rocks below ice are eroded by glacial processes (abrasion and plucking).

As glaciers move they push boulders, rocks, pebbles, etc. aside like a bulldozer. Other rocks become frozen in the ice and carried by the glacier.

A glacier cannot move bedrock, so it passes over it. As it passes it smooths, polishes and scrapes the front side of the rock.

As it passes over it, the ice flow pulls rocks on the backside away. This is called **plucking**.

Note: the fallen rocks on the backside of Devil's Slide are signs of weathering, but the rough surface models the effect of plucking.

Hemlock Gorge

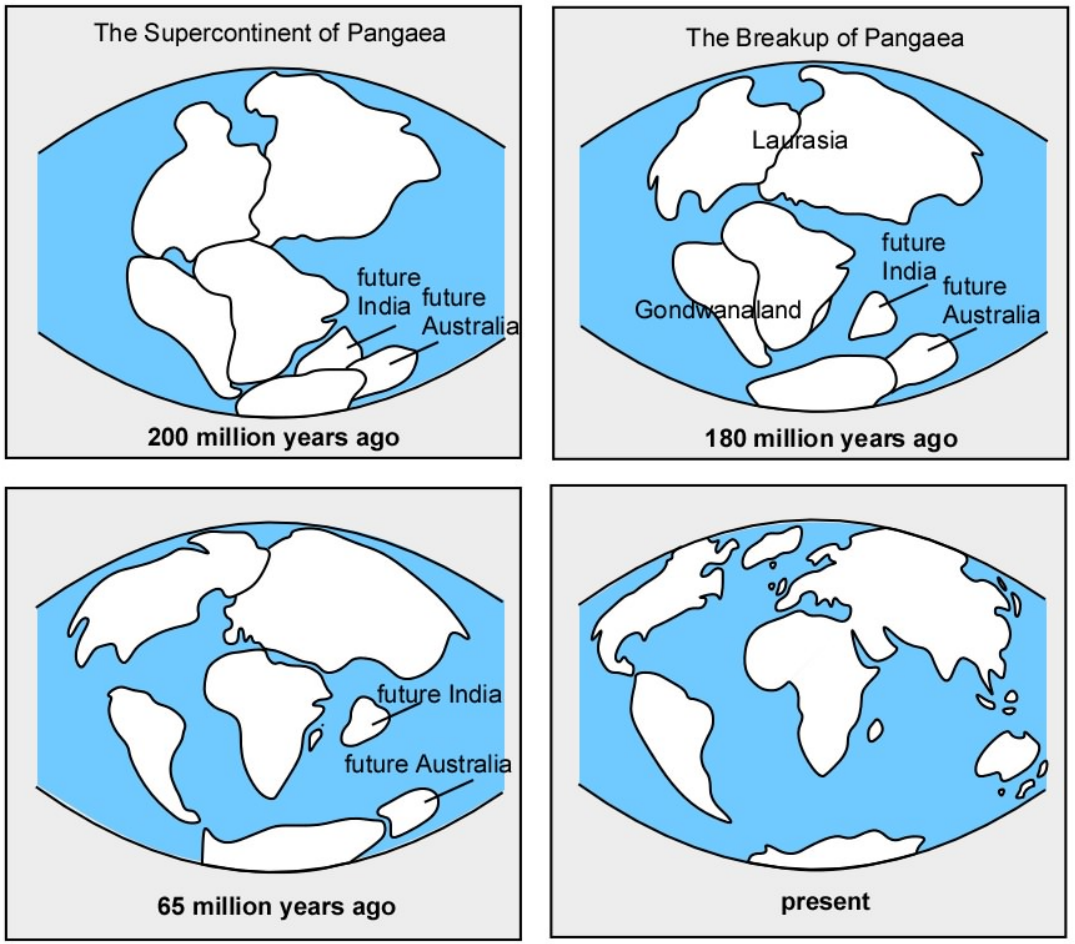
Weathering & Erosion

- River carved out the cave – mechanical weathering
- Debris from cave carried away - erosion
- Rocks falling out of the conglomerate– mechanical weathering (water, people, plants, etc.)

Formation

- Over 580,000,000 years old
- Sedimentary rock – conglomerate
- Roxbury Puddingstone
- Formed in Africa
- Earth movements caused rock layers to tilt

Approximate GPS Location: 24 Worcester St, Wellesley



The Roxbury Puddingstone formed in what is now Africa. Fast flowing streams flowed from mountains down to the ocean. Rocks of all sizes were deposited. The layers were later compressed under the sea to form the conglomerate rock.

During earth movements the puddingstone was exposed at the surface and titled so the layers are no longer flat.

When plate movements caused the plates to collide, the west coast of Africa bumped into North America.

When the continents later separated, part of Africa was left stuck to North America.