Glaciers

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Erosional Landforms 2

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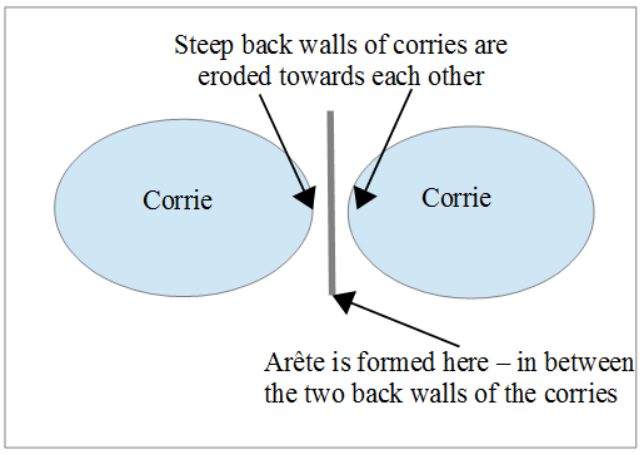
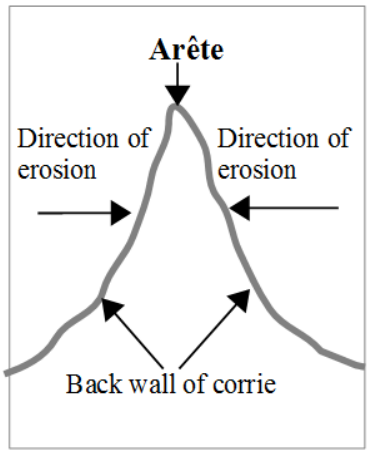
I. Arêtes and Pyramidal Peaks

Arêtes are created when two corries are formed back to back. As the steep back walls of the corries are eroded further and further back they leave a narrow, sharp ridge of rock between them – this is an arête. A good example of this is Striding Edge in the Lake District.

Ariel view of formation of an arête.

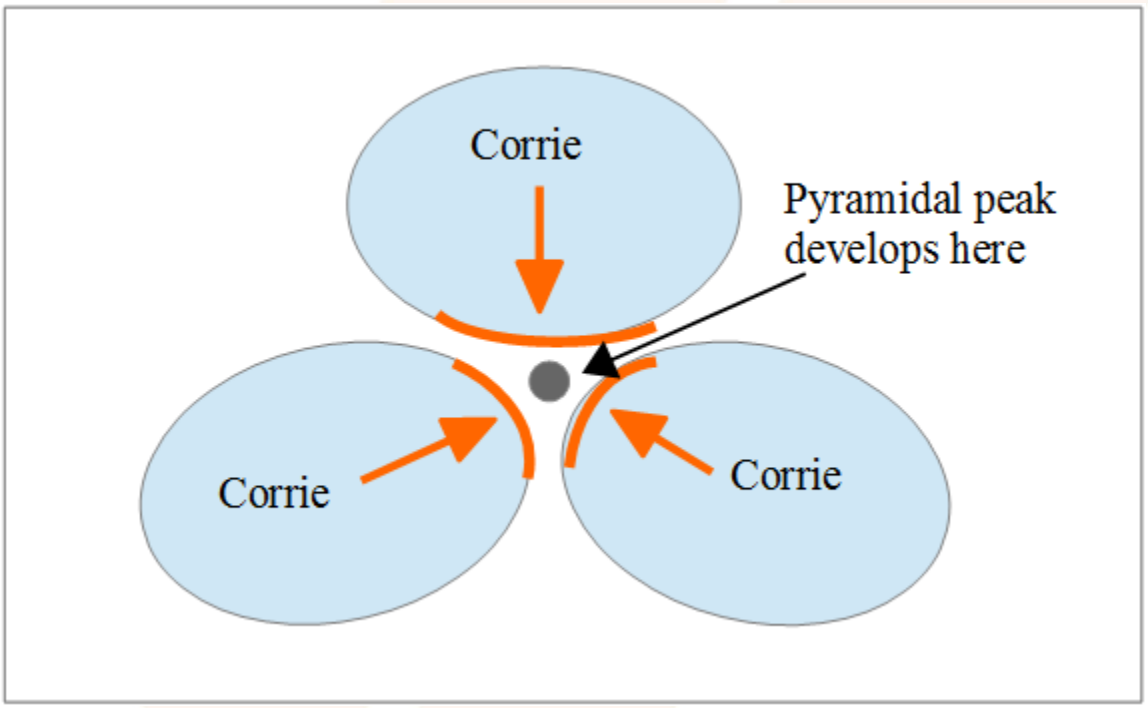


Side view of an arête.



If the back wall of three or more corries erode back towards each other then we are left with a steep point, the Matterhorn in Switzerland is an example of this.

1. Ariel view of formation of a pyramidal peak

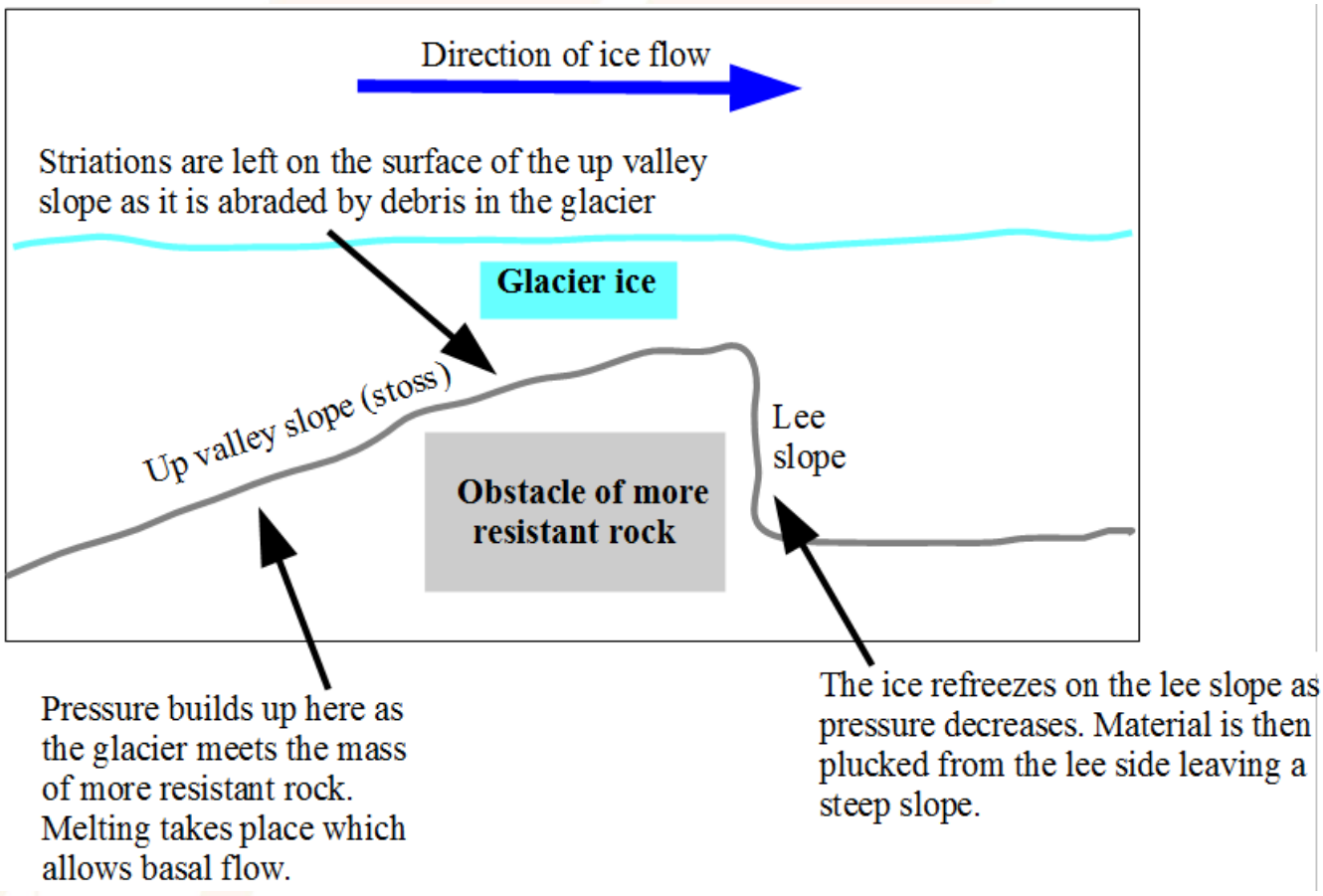


II. Roche Moutonnée

Roche moutonnée form on the valley floor when a glacier meets a mass of more resistant rock. They have rounded, smooth slope that faces up the valley towards the direction of the ice flow (stoss) and a steep slope facing down the valley (lee) in the same direction of the ice flow.

As the glacier comes into contact with the more resistant rock the pressure increases, the ice melts and basal sliding then takes place. Rocks which are trapped in the glacier and moving with it are under a huge amount of pressure, they abrade the surface of the more resistant rock and leave striations (scratches) on the up side slope (stoss). On the lee side of the slope (the down valley side) the pressure decreases and the melt water refreezes. As the ice then moves down hill it plucks pieces of rock away leaving a steep and jagged lee slope.

1. **Formation of Roche Moutonnée**



III. Crag and Tail

A crag and tail is formed when a glacier moves over an area of more resistant rock with less resistant rock on either side of it. It results in a formation which is the opposite way around to a Roche moutonnée, there is a large steep mass of rock on the up valley slope (stoss) and a sloping tail on the lee side.

The glacier erodes the less resistant rock as it approaches the more resistant mass. The outcrop of more resistant rock is left protruding from the land and acts as a barrier to partly protect the less resistant rock down valley – resulting in a sloping tail.

A good example of a crag and tail is the rock which Edinburgh Caste is built upon. The castle itself is built upon the crag which is a more resistant mass of volcanic basalt. The Royal Mile runs down the tail which is less resistant sedimentary rock.

Multiple Choice Questions

1. An arête is...

    a) a peak on the top of a mountain

    b) a narrow ridge of land formed by two corries eroding back towards each other

    c) the steep back wall of a corrie

    d) another name for a corrie?

2. 3 or more corries eroding back towards each other will form...

    a) a tail

    b) a crag

    c) a pyramidal peak

    d) an arête?

3. A roche moutonnée is formed when...

    a) a glacier meets a mass of more resistant rock on the valley side

    b) a glacier meets a mass of more resistant rock on the valley bottom

    c) a glacier meets a mass of less resistant rock on the valley bottom

d) a glacier meets a mass of less resistant rock on the valley side?

4. The up valley slope (stoss) of a roche moutonnée is...

   a) shallow and marked with striations

   b) steep and smooth

   c) shallow and smooth

   d) steep and jagged?

5. When glacier ice comes into contact with a mass of more resistant rock...

   a) the ice freezes to the rock and plucking occurs

   b) pressure decreases, the ice melts and basal sliding occurs

   c) pressure increases, the ice melts and basal sliding occurs

   d) the ice freezes to the rock and forms striations?

6. The lee slope of a roche moutonnée...

   a) is shallow and smooth because it has been abraded by rocks stuck in the glacier ice

   b) is steep and smooth because erosion rates have been increased due to basal sliding

   c) is shallow and scratched as rocks embedded in the ice have created striations

   d) is steep and jagged as the ice refreezes and plucking occurs?

7. The crag of a crag and tail has...

    a) a shallow gradient; it is made from less resistant rock

    b) a steep gradient; it is made from more resistant rock

    c) a shallow gradient; it is made from more resistant rock

    d) a steep gradient; it is made from less resistant rock?

8. A tail is formed from...

    a) a mass of more resistant rock

    b) debris carried in the glacier

    c) less resistant rock that is up valley of a mass of more resistant rock

    d) less resistant rock that is down valley of a mass of more resistant rock?

9. A tail has a gentle gradient because...

    a) it is made of more resistant rock so it erodes more slowly

    b) it is made of less resistant rock so it erodes more slowly

    c) the mass of resistant rock gives it some protection from erosion

    d) the mass of resistant rock increases the rate of erosion?

10. Edinburgh Castle crag is composed of...

    a) a more resistant mass of volcanic basalt

b) a less resistant mass of sedimentary rock

c) debris that has been carried down valley by a glacier

d) a more resistant mass of sedimentary rock?

Answers

1 = b, 2 = c, 3 = b, 4 = a, 5 = c, 6 = d, 7 = b, 8 = d, 9 = c, 10 = a.