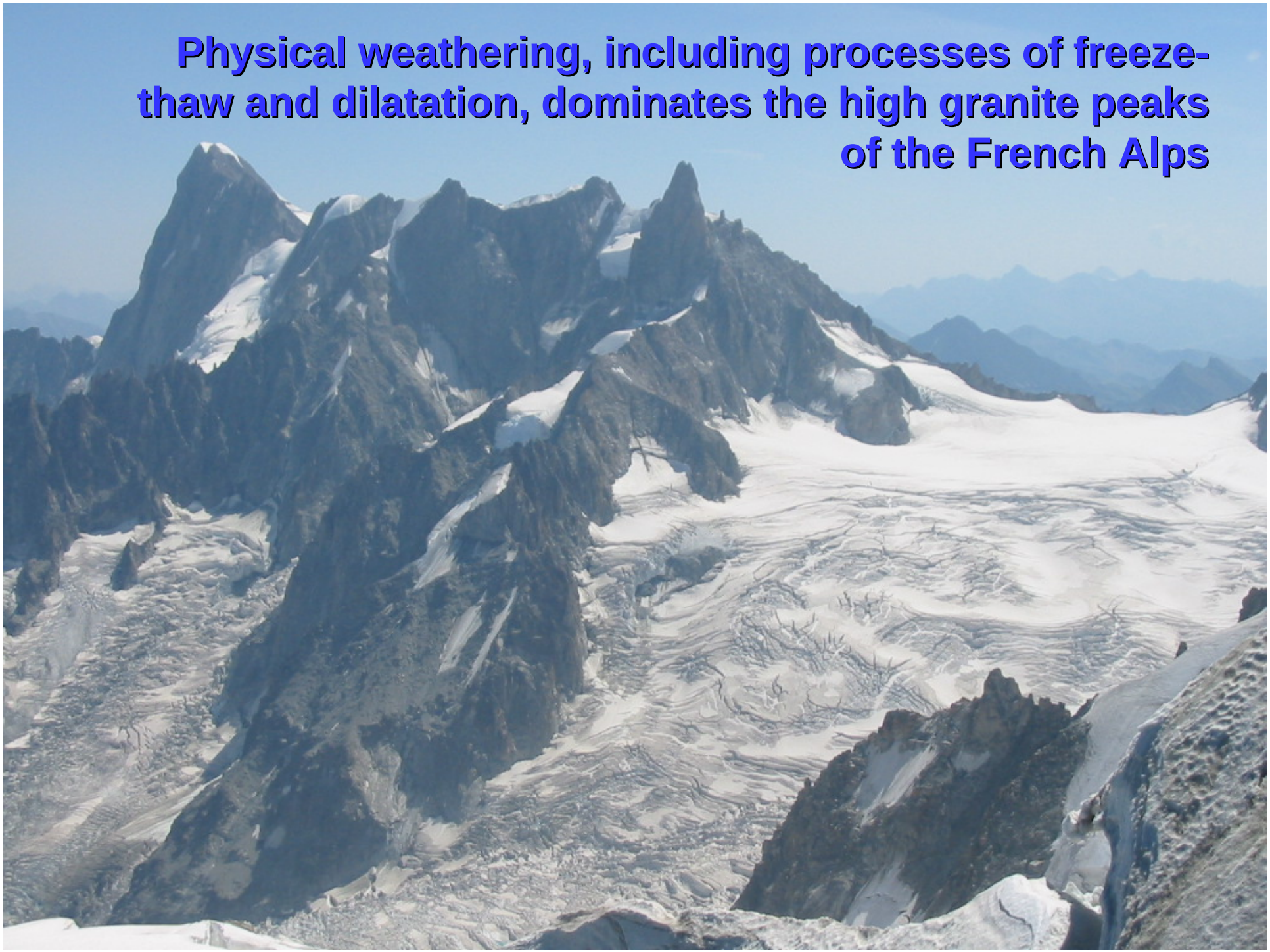
Weathering and Erosional Processes

The process of weathering in glacial environments is dominated by:

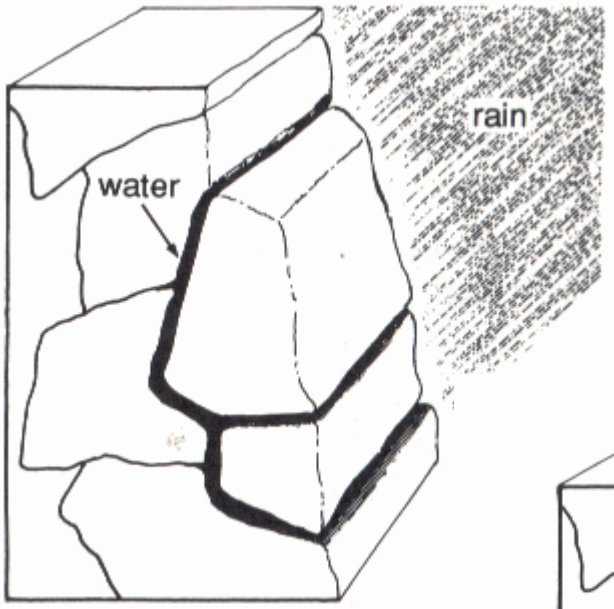
Frost Action – the action of water freezing and expanding, by as much as 9%, leading to frost-splitting or congelifration. The resulting rock debris may fall away or may be removed by periglacial processes such as solifluction.

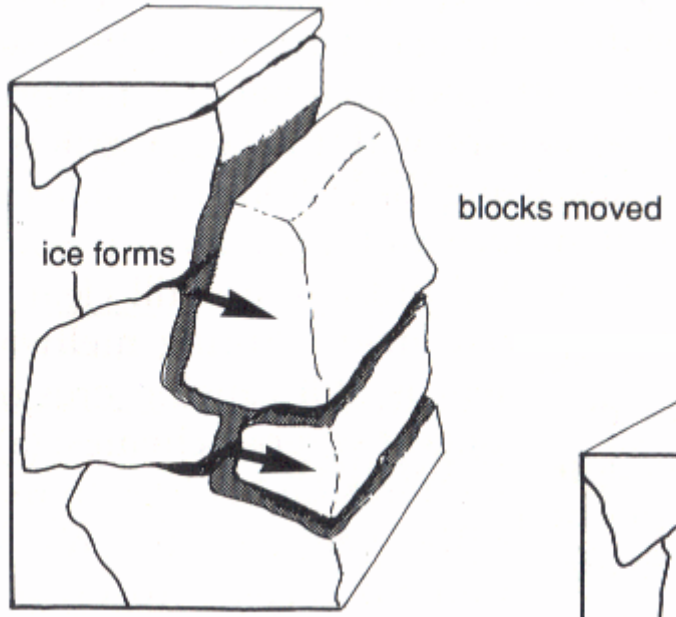
Dilatation – the action of **pressure release** within a mass of rock as a result of the removal of overlying layers. When ice sheets (or eroded rock) are removed, there is an outward expansion of the rock leading to the formation of expansion joints or dilatation joints. Sheet-like layers of rock peel off at right angles to the direction of pressure release. Once loosened, the outer layers are prone to further weathering and erosion.

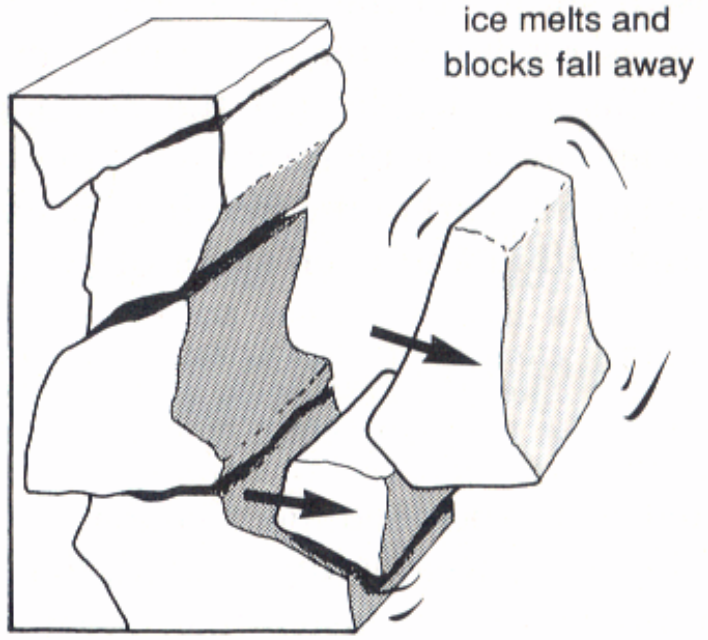
Other forms of physical, chemical and biological weathering may play a limited and localised role, but they are relatively unimportant due to low temperatures and the lack of liquid water.


Physical weathering, including processes of freeze-thaw and dilatation, dominates the high granite peaks of the French Alps

The process of frost shattering and rock displacement on steep slopes







Evidence of Freeze-Thaw

The process of erosion is dominated by:

Abrasion: ice acts as an abrading agent of erosion. Particles of rock debris are dragged across a rock surface in the bed or sides of the glacier. Abrasion often leads to scratch marks of striations as the rock is eroded.

Plucking: a process of block removal or quarrying carried out by a glacier. Well-jointed blocks are pulled from the rock when the basal ice freezes to them, usually on the downstream side of a rocky protuberance.