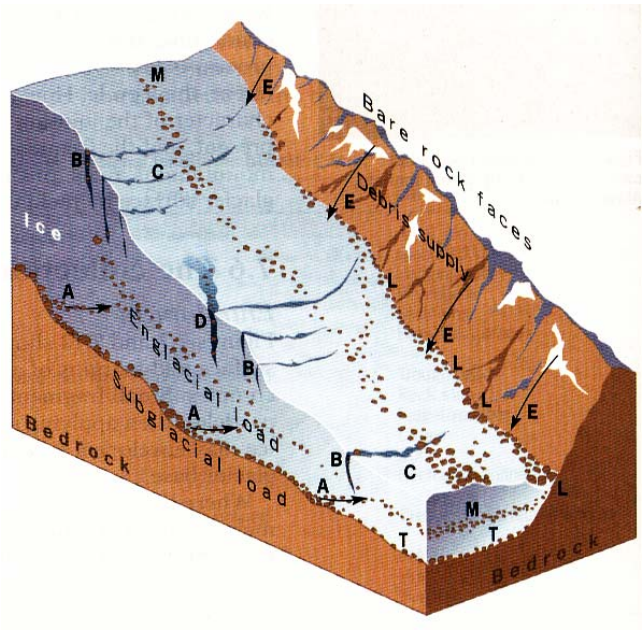
# A2 Geography 4.2 Glacial Systems Student Notes

## Processes of Transportation and Deposition

Rock Debris enters a glacier, either directly due to glacial erosion (plucking or abrasion) or as a result of weathering and rock falls onto the glacial surface of into crevasses.

Rock debris is transported as:

1. **Supra-glacial load** (carried n the surface).
2. **En-glacial load** (carried trapped inside the ice) or
3. **Sub-glacial load** (carried between the glacier and the bedrock.




**A Glacier as a Conveyer belt.**

A) **Ice shearing** carries basal debris into the glacier.
B) Debris enters ice through **crevasses**.
C) Crevasses.
D) **Meltwater streams** carry debris into ice.
E) **Rockfalls** supply debris to the glacier.

L) Lateral Moraine.
M) Medial moraine.
T) Till or ground moraine.

Deposition of glacial load occurs as a result of:

**Lodgement**: rock material is deposited by the sole of the glacier in a sub-glacial environment. It is often reworked following the initial deposition.
**Ablation**: rock debris is left as a result of loss of water through ablation (melting and/or sublimation).

Where, when and why deposition occurs depends on a range of factors including:

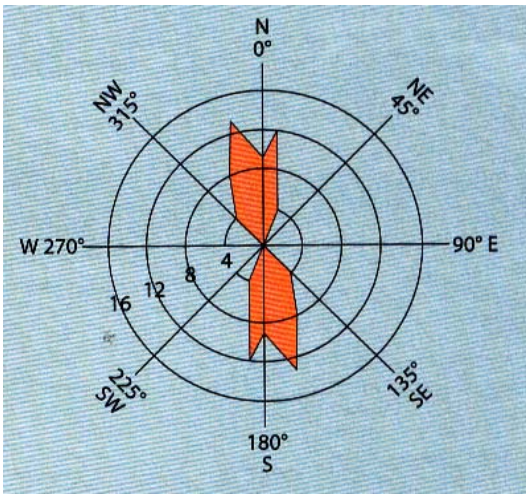
1. the **temperature of the ice** and surrounding air (influencing the rate of ablation)
2. ice **thickness**
3. the nature of the **bedrock** and
4. the **characteristics of the debris** transported (size, shape, rock type, etc.).

Glacial deposits are generally:

- **unsorted,**
- **angular and**
- **unstratified.**

Glacial tills may display a common orientation of elongated particles, usually in the direction of ice-flow.

Till-fabric analysis can tell us much about the flow patterns of former glaciers. You need to understand the concept of **till fabric analysis** and **radial graphs**.




The example rose diagram (right), taken from moraine deposits on the Isle of Arran, shows a north-north-west to south-south-east direction of flow. Work out how this diagram was compiled.