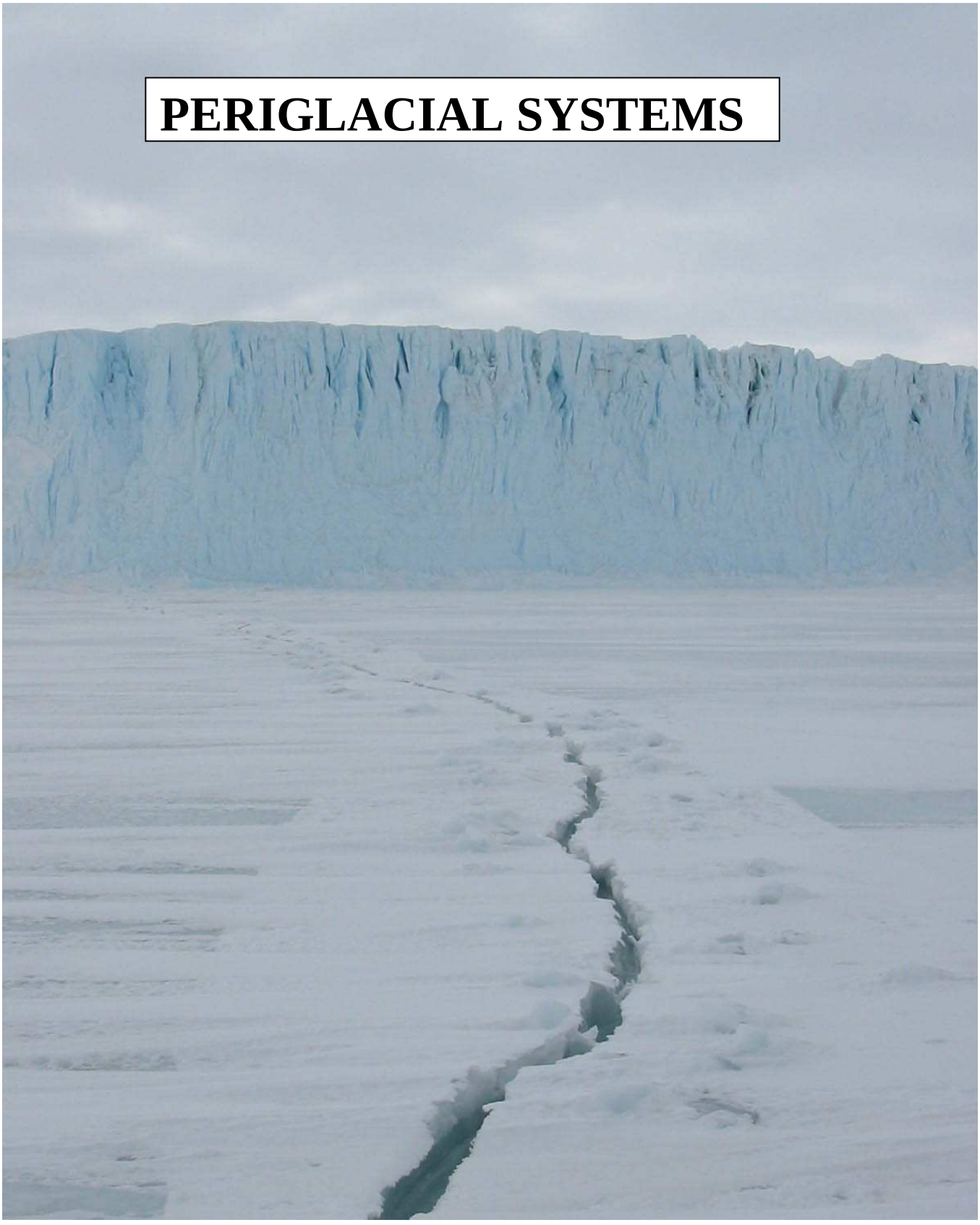
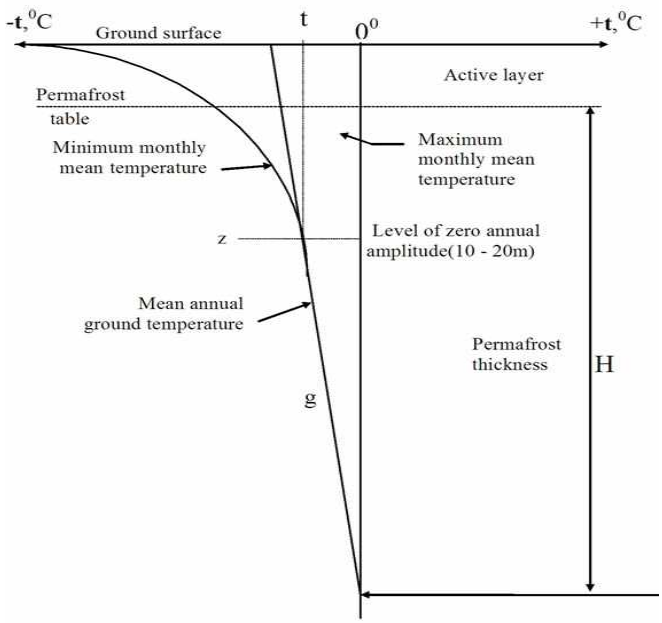
PERIGLACIAL SYSTEMS

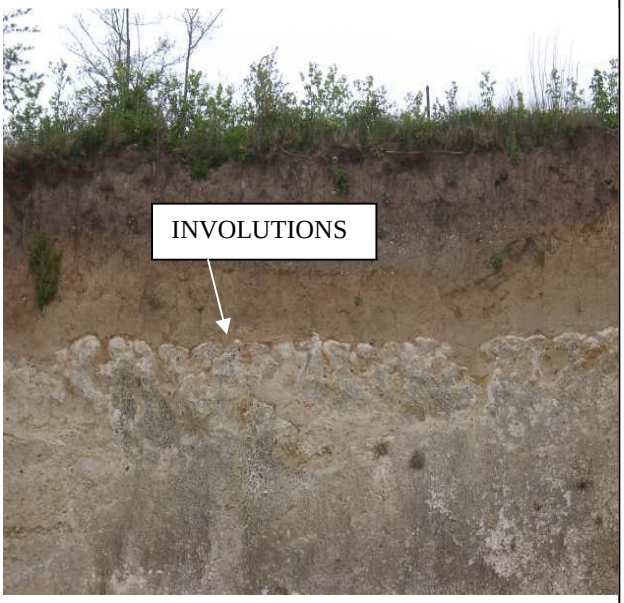


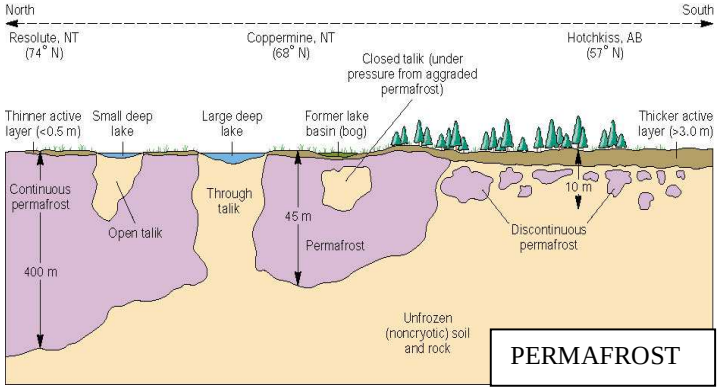
GLACIAL SYSTEMS

PERMAFROST AND THE ACTIVE LAYER

- The permanently frozen subsoil in the Arctic is called Permafrost, and is key to Periglacial processes.
- The permafrost can be Continuous, Discontinuous or Sporadic; unfrozen ground is called Talik.
- The top metre or so thaws out in summer producing the Active Layer, a saturated mobile layer.
- This active layer is where sub-aerial processes and freeze-thaw processes are most active.
- Involutions or contorted soil beds can form due to the freezing and thawing of the active layer.
- Freeze-thaw action and frost sorting can produce stone polygons and circles on the surface.







PERMAFROST

STONE CIRCLES

What is Permafrost?

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What is the Active layer?

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What are freeze-thaw processes?

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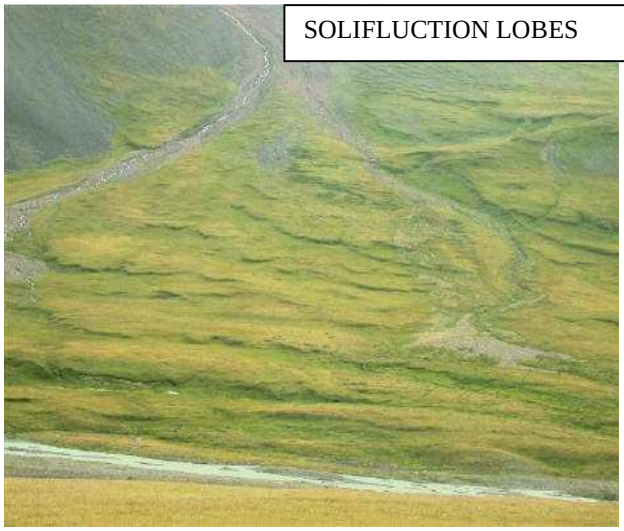
GLACIAL SYSTEMS

PERIGLACIAL PROCESSES

- Freeze-thaw cycles mean that Physical weathering due to Frost Shattering/Frost Wedging is dominant.
- Forces caused by the expansion of ice as it freezes forms Screes on slopes and Felsenmeer on plateaux.
- The main sub-aerial process of downslope movement of partly frozen regolith is Solifluction.
- This is due to the slumping of the active layer, saturated due to the impermeability of the permafrost.
- Solifluction is aided by the wetting / drying, freezing / thawing and frost heaving of the active layer.
- This process forms the subdued landscapes of Periglacial areas and benches called solifluction lobes

A BOULDER FIELD OF FROST SHATTERED ANGULAR DEBRIS



SOLIFLUCTION LOBES

SCREE SLOPE

Explain frost shattering and the formation of Scree/Talus slopes:

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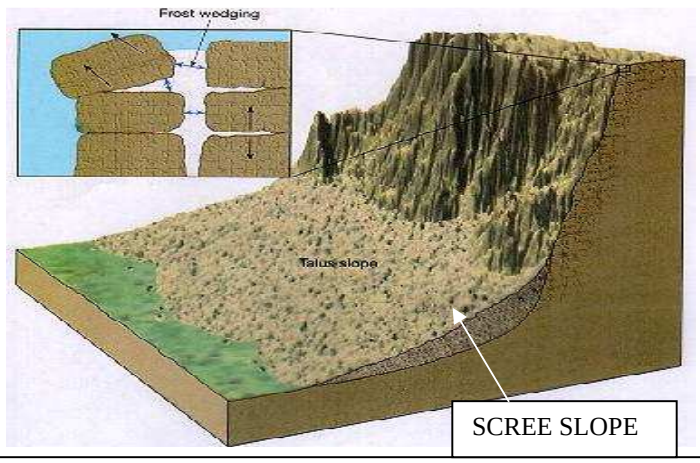

SCREE SLOPE

How does Solifluction move debris downslope?

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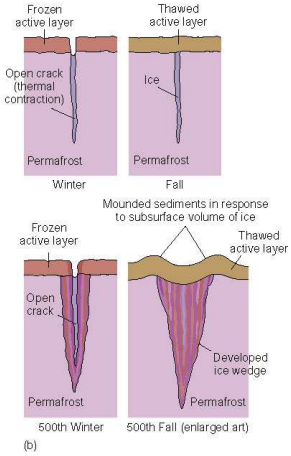
GLACIAL SYSTEMS

ICE SEGREGATION AND THERMOKARST

- In the active layer and in the permafrost discrete accumulations or segregations of ice may grow.
- These segregations can take the form of ‘pipkrakes’ (ice needles), lens, wedges or larger accumulations.
- Ice wedges can form near the surface as ice expands and pushes downwards.
- Palsas are small-scale mounds caused by the freezing and accumulation of lenses of ice.
- Larger scale accumulations can push the surface up into Pingos, mounds up to 100 m in height.
- Melting of ice causes the surface to collapse leaving hollows and lakes called Thermokarst.



ADD THE FOLLOWING LABELS TO THE CORRECT PHOTOGRAPHS :

PALSA

PINGO

ICE WEDGE

THERMOKARST DEPRESSIONS

PERMAFROST

GLACIAL SYSTEMS

PERIGLACIAL LANDSCAPES

- Periglacial processes of frost shattering and solifluction in tundra climates form typical landscapes.
- These landscapes have a subdued relief of gentle slopes with isolated rocky tors and frost-riven cliffs.
- The process of producing these periglacial landscapes is called cryoplanation.
- Area not in the periglacial zone today may show typical periglacial forms due to recent ice ages.
- The dry valley systems of chalk uplands in Britain owe their origins to past periglacial conditions.
- Britain exhibits other ‘fossil’ or ‘relict’ features from its time in the periglacial zone.