

## CHAPTER 13 = GLACIATION

-GLACIER=is solid mass of moving frozen snow

### GLACIATION

An ice age is a period during which the large parts of several continents are covered by ice sheets the last ice age has been over a million years ago and ended about 10,000 years ago during this time the temperatures were so low that snow and ice did not get a chance to melt year after year more snow and ice accumulated until it compacted together to form huge masses of ice called glaciers. glaciers **formed in upland areas**. the effect if gravity eventually moved them downslope. some glaciers melted while other joined together to form ice sheets which covered huge areas of land.

#### What causes an ice age?

(1) The earth's orbit of the sun changes from an oval or elliptical shape to a circular shape that means that the temperature on earth does not change much because any point on the earth remains the same distance from the sun all year round.

(2) the angle of the earth's axis changes that means that those areas of the earth's surface that are closer to poles are tilted further from the sun and so they are colder.

#### **Glaciers erode the rock, transport the rock and deposit rock.**

##### Processes of glacial erosion

###### (1) plucking

In order for plucking to occur there needs to be friction friction produces melt water that will flow into cracks in rock. And refreezes and expands by 9 % that then loses the rock and therefore when the glacier moves it plucks some of the rock with it effective on rocks such as sedimentary rock like limestone and sandstone. there is friction between the underside of the glacier and the ground beneath it. this leads to some melting around the base of the glacier. if the glacier stops moving, the meltwater refreezes around the rocks on the valley floor. when the glacier moves forward again, it plucks pieces of rock from the ground and carries them away.

###### (2) abrasion

As the glacier moves along the rocks attached to it scratch and scrape the surface rock underneath. The scratch marks left behind on rocks over which the ice has moved are called striations. these marks tell us the direction in which the ice moved. it's the force of moving glaciers and their load (plucked rock-jagged) small stones boulders. plucking and abrasion depend on the size of glacier and the slope/gradient the steeper the slope the faster the glacier and the resistance of the rock sedimentary rock is a very weak rock (joints) igneous and metamorphic rock are stronger.

**Lubricant**=makes something slippery.

##### Features of glacial erosion

(1) corrie/cirque (2) aretes (3) pyramidal peaks (4) U-shaped valleys (5) ribbon lakes (6) hanging valleys (7) fjords

##### Feature of glacial erosion

**Feature**=corrie/cirque

Example=Galtees Mts tipperary or devils punchbowl co.kerry

explain=• a corrie is the birthplace of a glacier.glaciers are formed in pre existing hollows on the north/north east facing side of a mountain .They form at mountains because at mountain for every 1,000m the temperature drops by 7 degrees celsius.

- the process of plucking =In order for plucking to occur there needs to be friction friction produces melt water that will flow into cracks in rock. And refreezes and expands by 9 % that then loses the rock and therefore when he glacier moves it plucks some of the rock with it effective on rocks such as sedimentary rock like limestone and sandstone and the process of abrasion=As the glacier ,moves along the rocks attached to it scratch and scrape the surface rock underneath.The scratch marks left behind on rocks over which the ice has moved are called striations.these marks tell us the direction in which the ice moved.its the force of moving glaciers and their load(plucked rock-jagged)small stones boulders .plucking and abrasion depend on the size of glacier and the slope/gradient the steeper the slope the faster the glacier and the resistance of the rock sedimentary rock is a very weak rock(joints) igneous and metamorphic rock are stronger. Enlarge the hollow overtime to form a corrie.
- the glacier eventually moves out of the corries moves downslope via an existing river valley
- now the corries is filled with water lake -tarn
- If 2 corris erode side by side into the mountain the land that separates them is called an arete.
- if 3 glaciers erode into the same mountain the land that separates them is called a pyramid peak eg carrauntoohil=hill.when glaciation is over some corries fill with water to form a lake called a tarn lake.

Diagram=

Diagram of glacial erosion page 243

### 2nd feature of glacial erosion

Feature =u-shaped valley

Example=glendalough co.wicklow

explain=its a feature of glacial erosion formed by the process of plucking and abrasion.when the glaciers left the corrie they moved down slope to a V-shaped river valley because the glacier couldn't move freely as a river or it was more powerful meant that the glacier denied the v shaped river valley to form a u shaped glacial valley.it has a wide base and steep sloping sides.now that's the glacier.it is over the stream that occupies the u shaped valley floor is called a mis fit stream.as the glacier moved through v shaped valley ot plucked out rock from its lakes/paternost lakes.in a v shaped valley the river had to flow around interlocking spurs the glacier erodes the edges of these spurs forms truncated spurs.u shaped valleys also contain hanging valleys.

### 2 ways glaciers deposit their load

(1)boulder clay=stationary glacier deposits unstratified big boulders and small clay/sand.features=drumlins and moraines

(2)fluvio glacial materials=rivers of melt water they sort their load.eg curragh co.kildare.

Features of glacial deposition=(1)boulder clay plains (2)drumlins (3)erratics (4)moraines

### Feature of glacial deposition

#### Moraine

Moraine is a feature of glacial deposition . when glacier begin to melt they deposit sand,gravel,boulders along both sides of their u shaped valley to form a lateral moraine.when a

tributary glaciers joins the 2 lateral moraines join together forming a medial moraine.both lateral and medial moraines are parallel to ice movement.if a glacier stops for long periods of time recessional moraines form and are perpendicular to ice movement. when the glacier finally stops it deposits its remaining load perpendicular to ice movement this is called a terminal moraine.

Diagram=

### 2nd feature of glacial deposition

#### Drumlin

example=cley bay,co.mayo

It is a feature of glacial deposition.it is made up of boulder clay stationary,unsorted.egg shape.the glaciers moved from a steeply to gently sloping side.normally occurs in clusters if formed near the coast they can get drowned by rising sea levels;drowned drums.

### Features of meltwater deposition

#### (1)Esker (2)outwash plain

##### (1)Esker-esker riada co.galway

An esker is an long,narrow ridge of sand or gravel that winds its way along a lowland landscape.when glacier melts the streams of meltwater carrying a load of eroded material flow underneath it.as the meltwater increased in volume,a tunnel was carved out under the glacier.some material was deposited on the bed of the meltwater stream.

Diagram=

##### (2)outwash plains -curragh co.kildare.

An outwash plain is a low,flat area of land made of sand and gravel found in the front of a terminal moraine.

### Human Activities and Glaciation

#### -Positive influences of glaciation

(1)farming=the boulder clay deposited during the ice age makes very fertile soil that is suitable for agriculture.the golden vale area in munster is famous for its productive agricultural industry.

(2)tourism=the beautiful landscape created by glaciation is an important tourist attraction in places like Glendalough co.wicklow .Thousands of visitors visit each year. That is very good for the economy as it creates jobs like cafe workers,mechanics.business have to pay tax to the government then the government uses the money for better infrastructure

##### (3)Hydroelectric Power-turlough hill co.wicklow.

Glacial lakes provide a natural reservoir for the generation of hydroelectric power.the hep station at turlough hill co wicklow uses water from lough nahanagan which is a cirque lake to generate electricity.glaciated u shaped valleys provide natural routeways through upland areas.glen of the

downs in Co Wicklow is an example. Hydroelectric power is renewable and environmentally friendly and will future proof our energy needs.

### Negative influences of glaciation

(1)poor drainage=glacial deposits such as drumlins can lead to poor drainage causing bogs to develop in some areas

(2)flooding=today's glaciers and ice caps in the arctic and antarctica are melting at an alarming rate. this causes sea levels to rise if they continue to rise, lowland coastal areas of Ireland will be at risk of flooding.

### Exam questions

Explain how the processes of glacial erosion shaped the landscape.

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#### (2)abrasion

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#### (3)crushing

Sheer force of moving glaciers bigger/thicker glaciers can crush the rock faster.