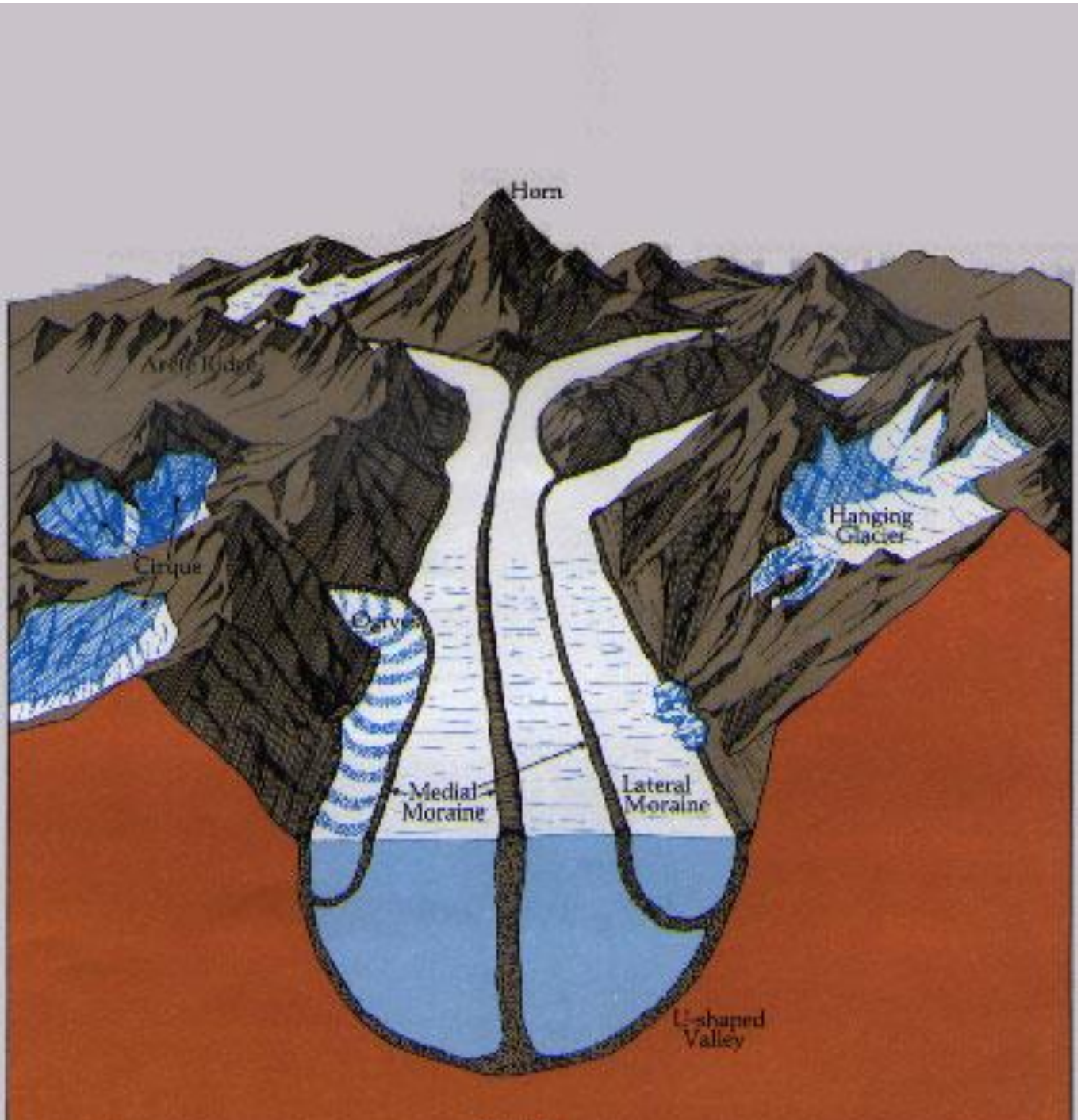
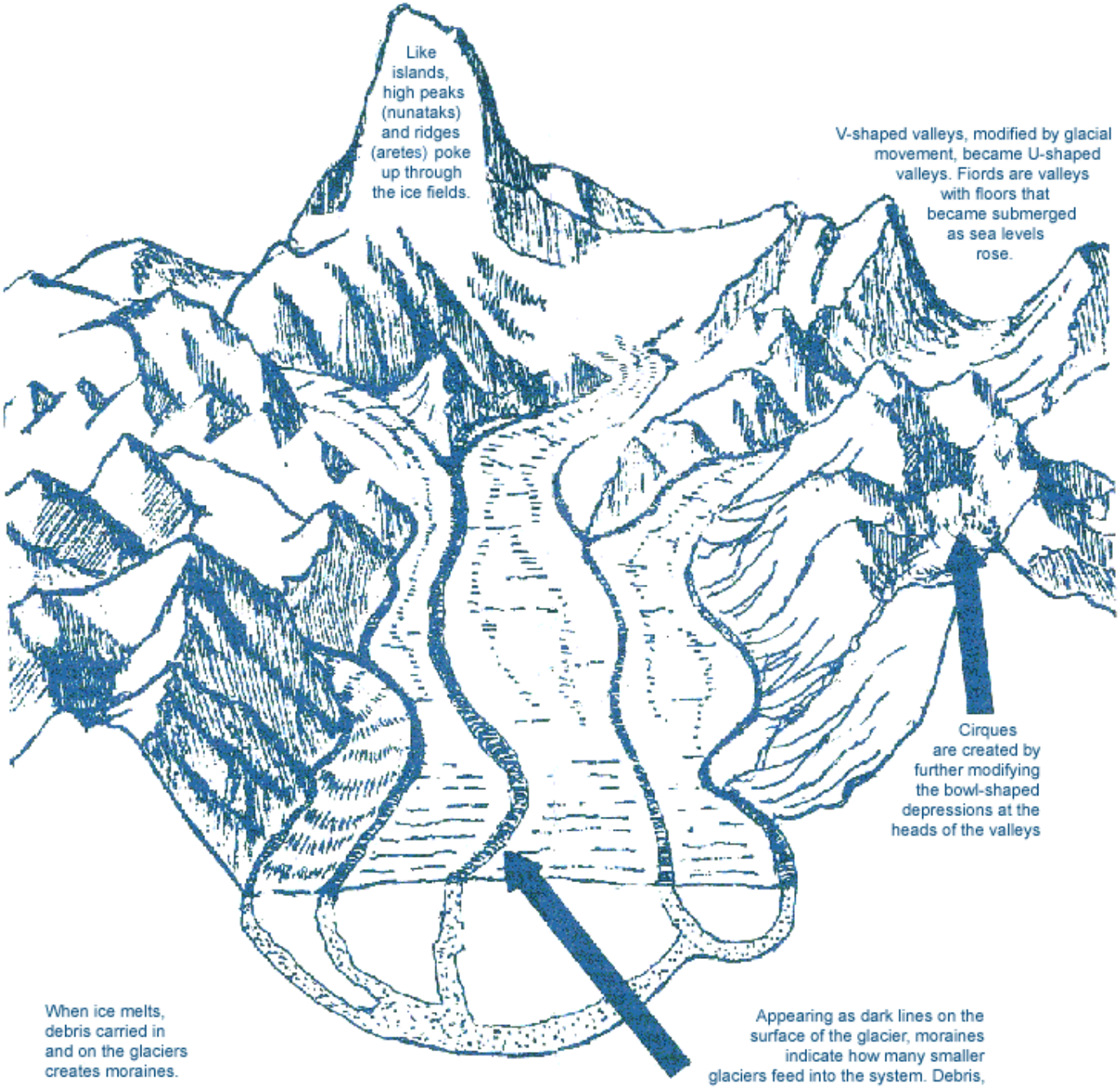
GLACIAL LANDFORMS SHAPE MOUNTAINS

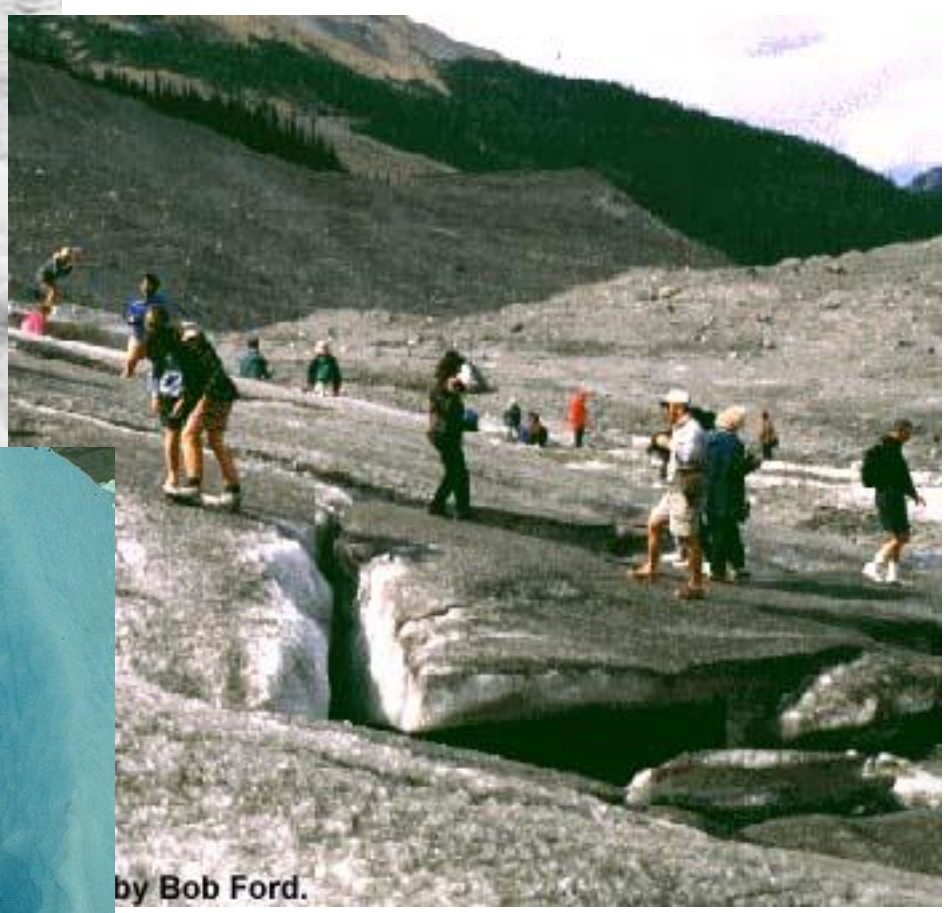
- Ice
- Plumbing
- Erosional
- Depositional



OVERVIEW:
With glacier


Like islands, high peaks (nunataks) and ridges (aretes) poke up through the ice fields.
V-shaped valleys, modified by glacial movement, became U-shaped valleys. Fiords are valleys with floors that became submerged as sea levels rose.
Cirques are created by further modifying the bowl-shaped depressions at the heads of the valleys
When ice melts, debris carried in and on the glaciers creates moraines.
Appearing as dark lines on the surface of the glacier, moraines indicate how many smaller glaciers feed into the system. Debris, pushed in front of the glacier, creates a terminal moraine.

CREVASSE



Brittle deformation.
Narrower with depth.
Rarely more than 20 meters in depth.

BERGSCHRUND

•Climbers bane
•Crack that separates moving Ice from stable ice
•Almost all mountain glaciers Have Bergschrund’s

HANGING GLACIER

Occur in tributary glaciers, cause spectacular waterfalls

SERACS

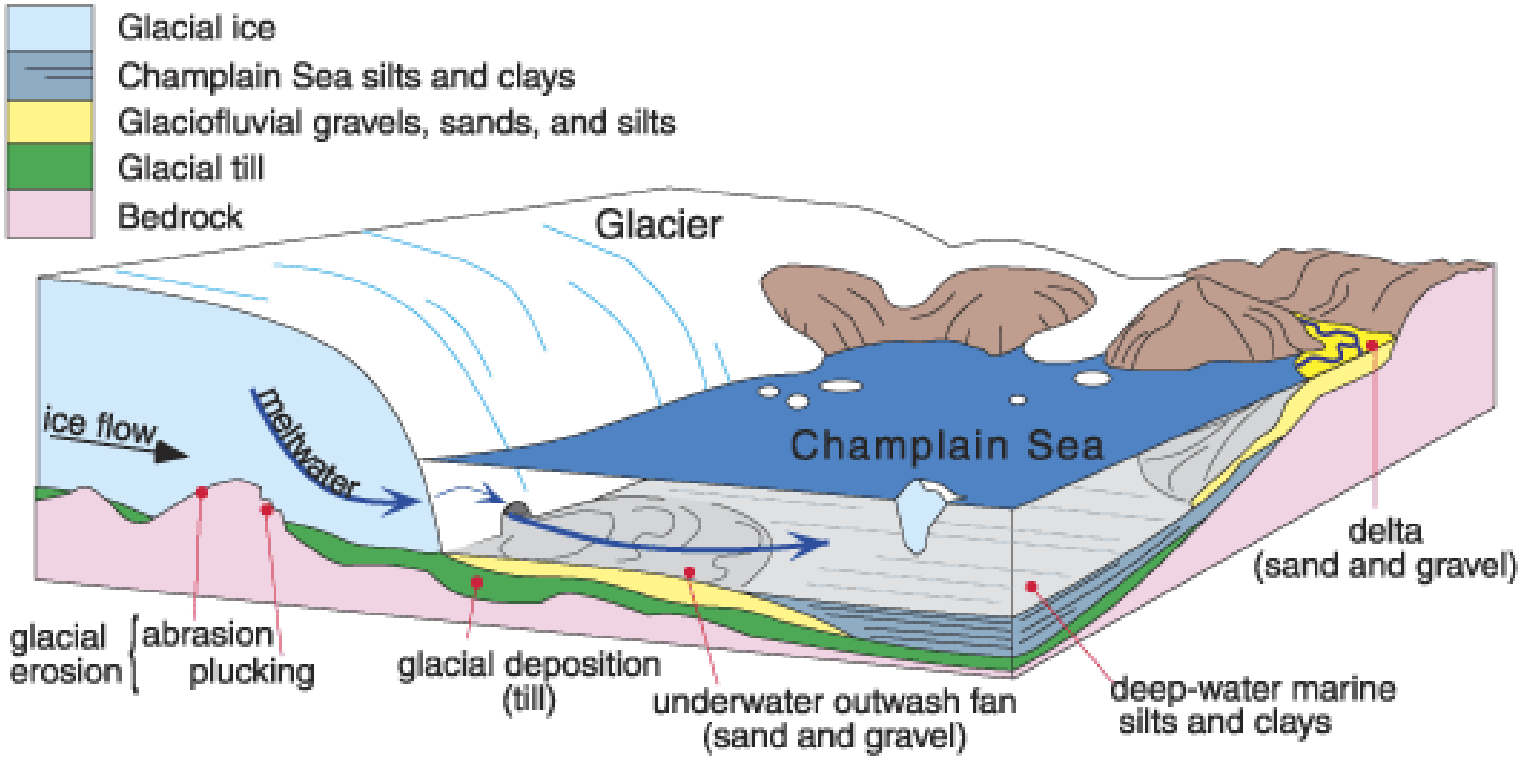
Ice towers on glaciers
Usually better-developed towards toe of glacier

ICEBERGS

9/10 of mass below water surface

Alaska: tides 40 feet high

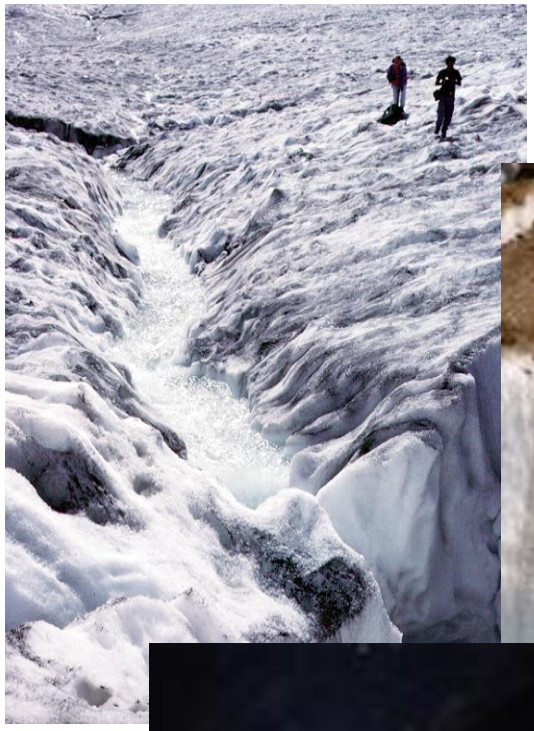
GLACIAL PLUMBING



SUPRA-GLACIAL STREAM

Glaciers can have streams on their surface!

MOULINS



Holes in glaciers that water flows through
Connect surface streams to subsurface streams

Sediment deposition
forms kames

SUB-GLACIAL STREAMS

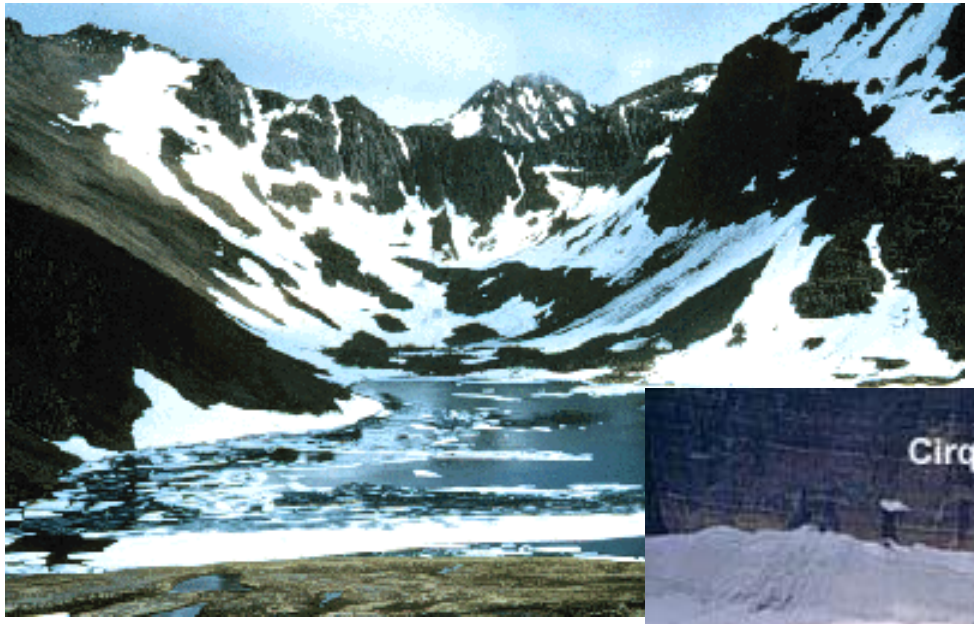
Deposition forms eskers Causes glacial surges

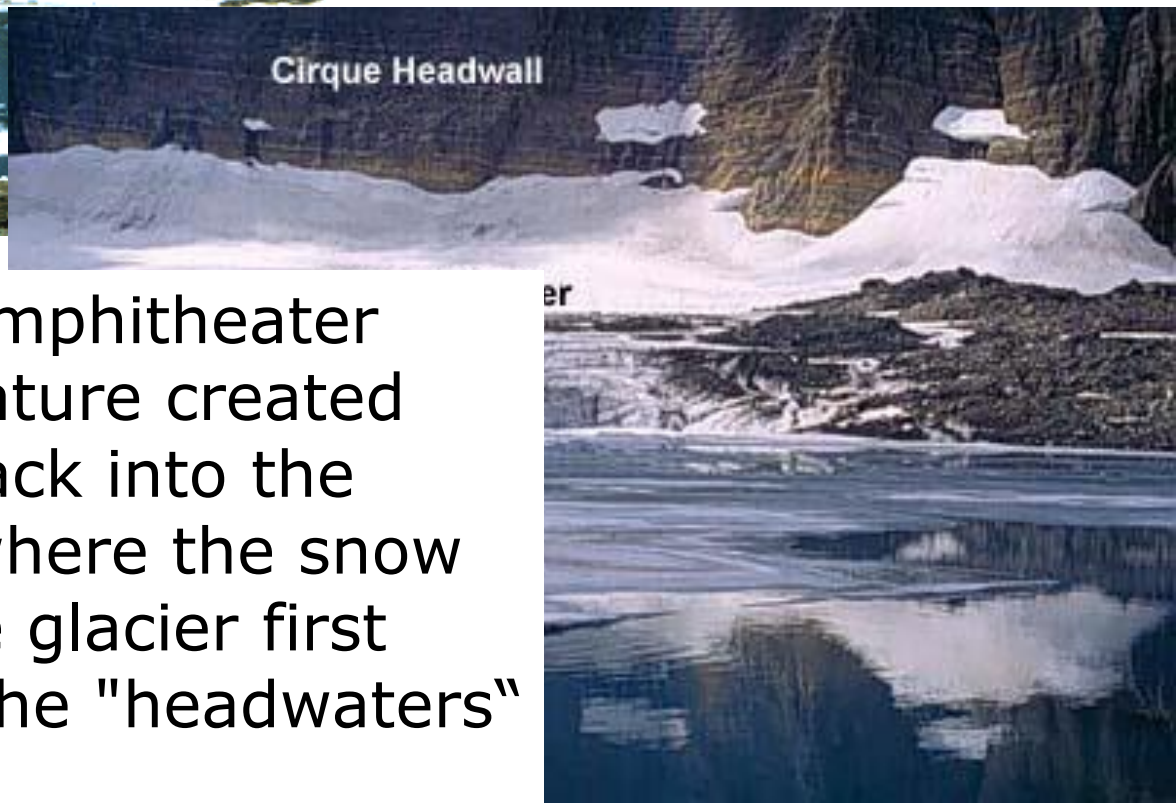
ICE CAVE AT BOTTOM OF GLACIER

Looking inside a sub-glacial stream;

•Can be 10-km in length or more

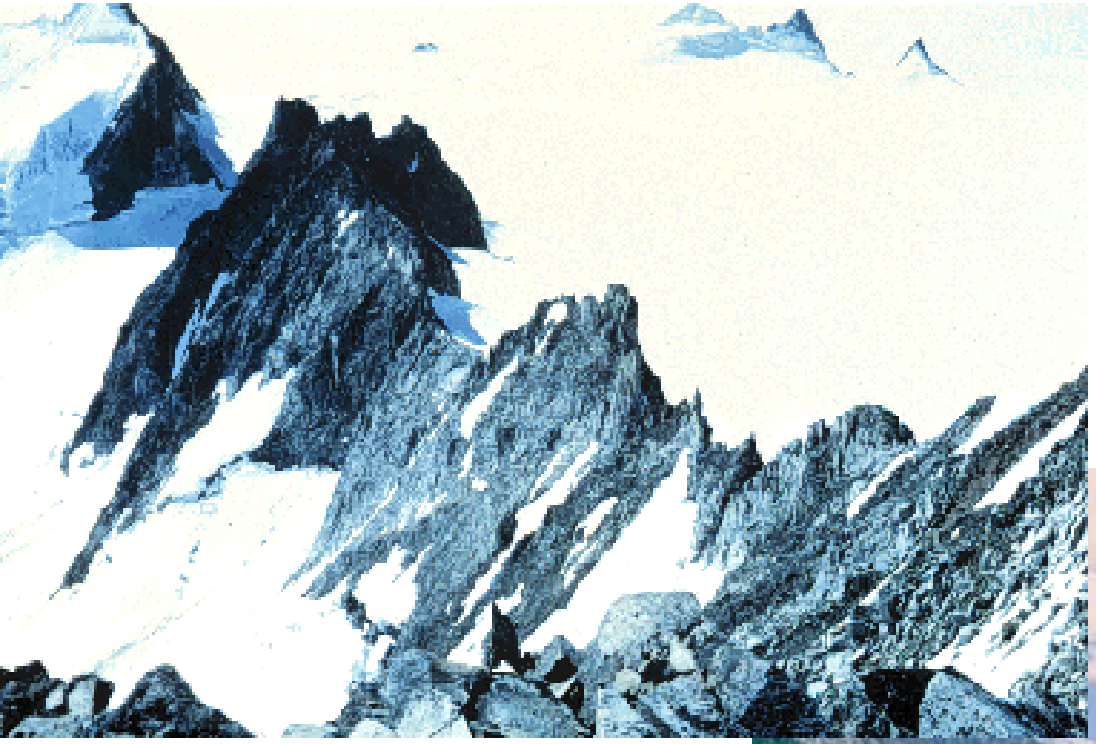
CIRQUE

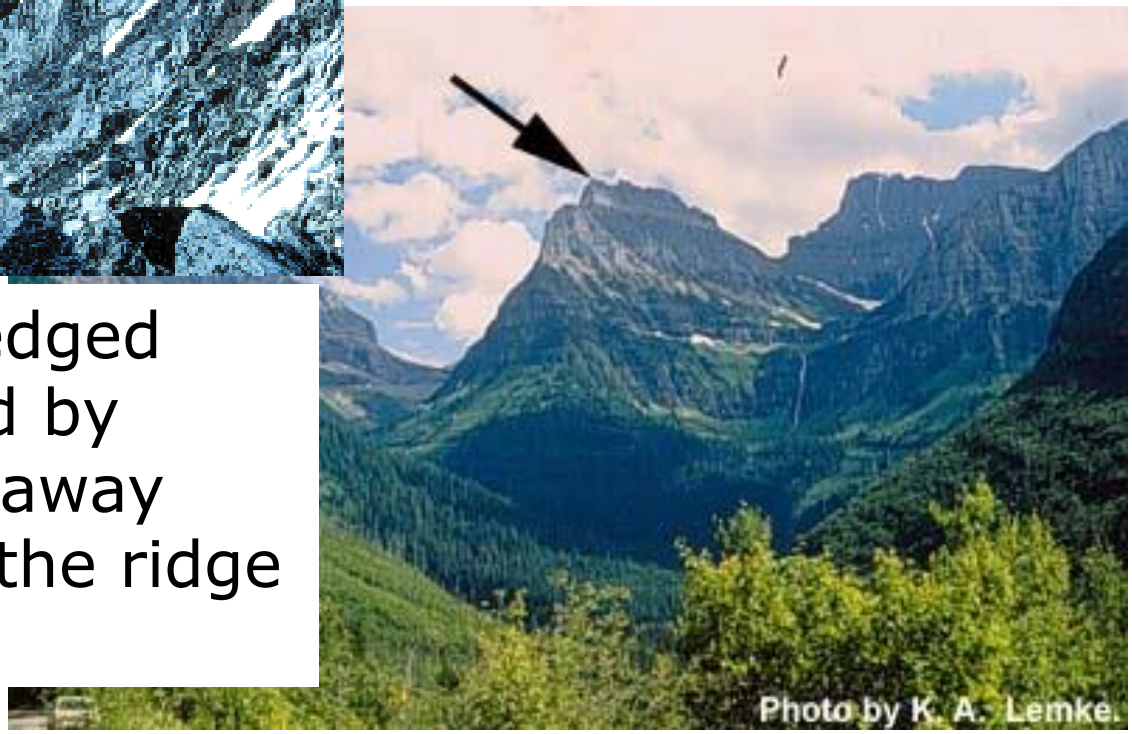




- a semicircular or amphitheater -shaped bedrock feature created as glaciers scour back into the mountain. This is where the snow and ice forming the glacier first accumulates; it is the "headwaters" of a glacier.

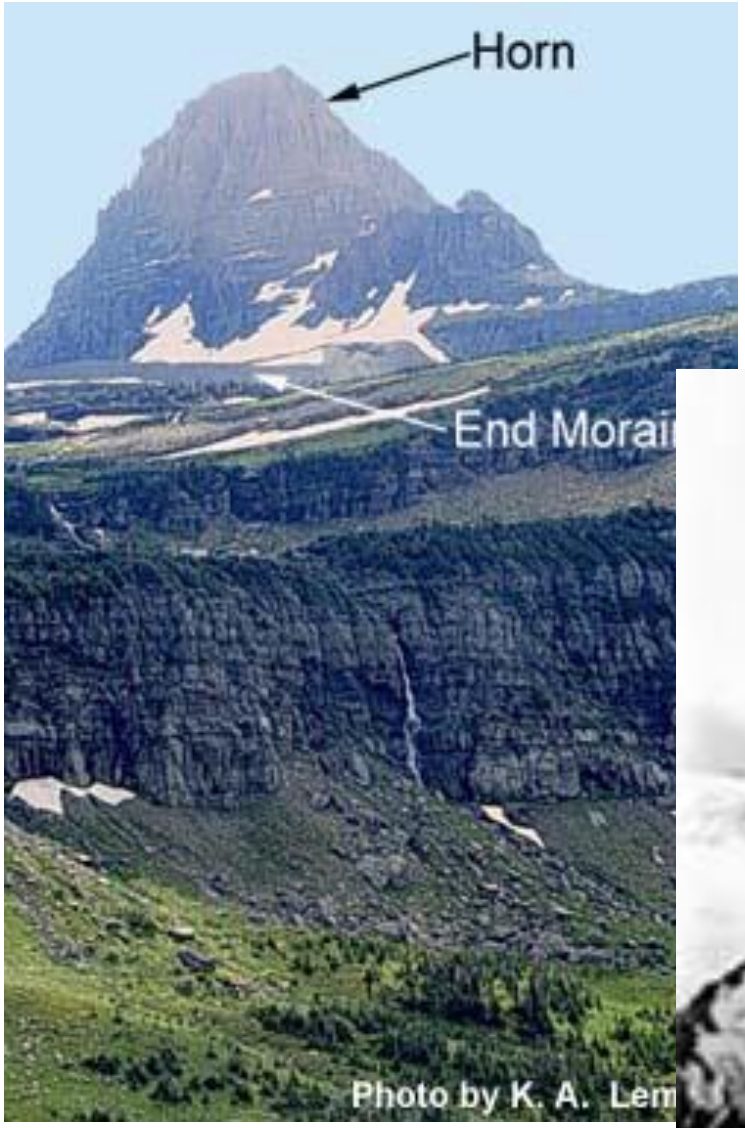
ARETE





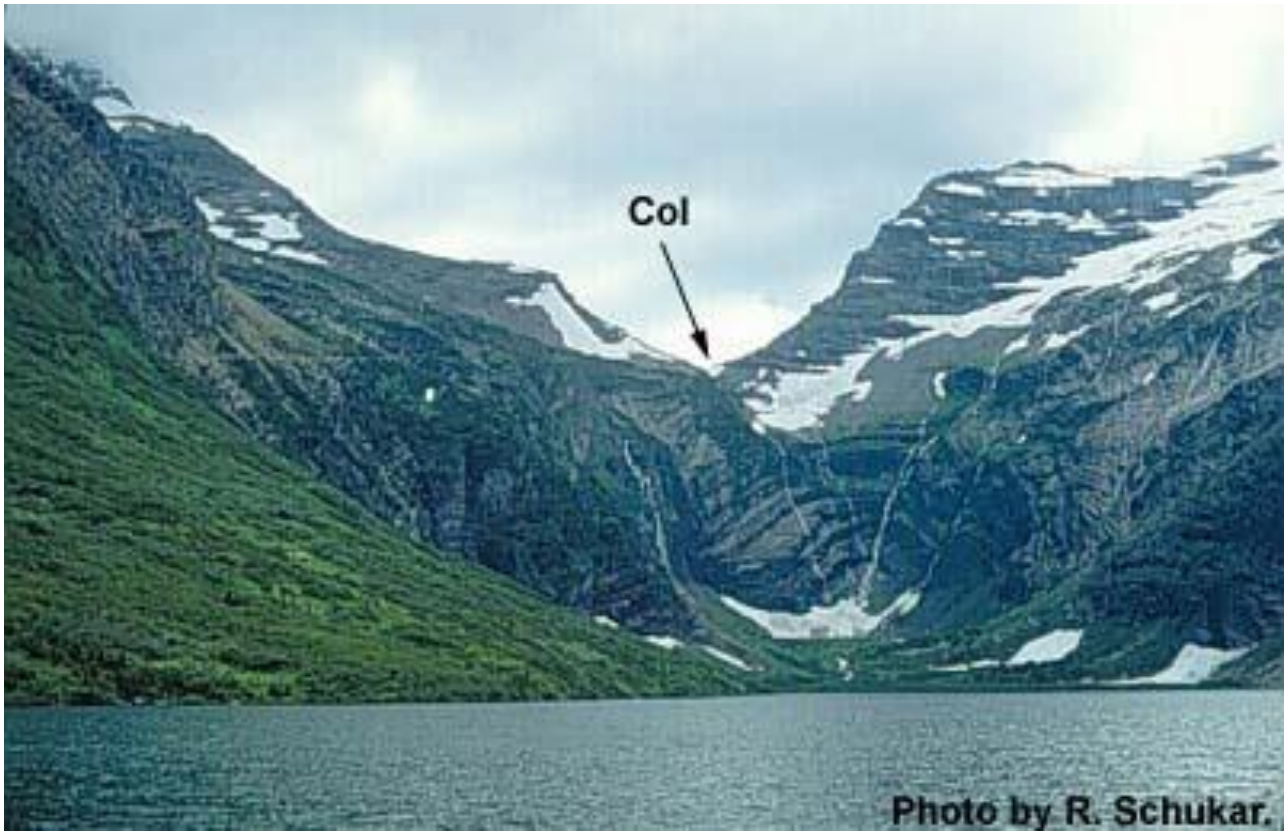
- steep-sided, sharp-edged bedrock ridge formed by two glaciers eroding away on opposite sides of the ridge

HORN



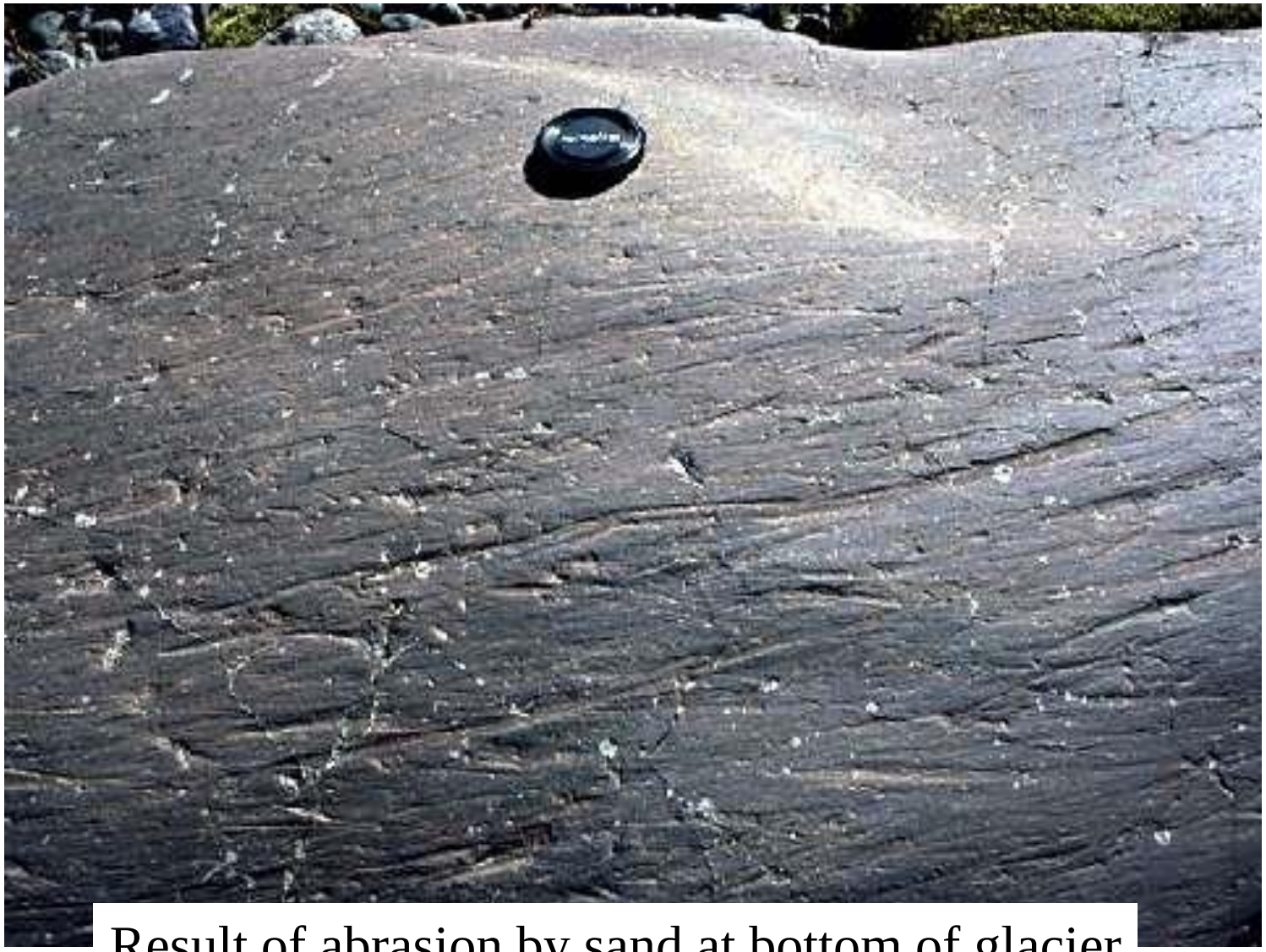
- a pyramid-shaped mountain pea created by several glaciers eroding away at different sides of the same mountain.

COL



- a low spot or pass along a cirque or an arete.

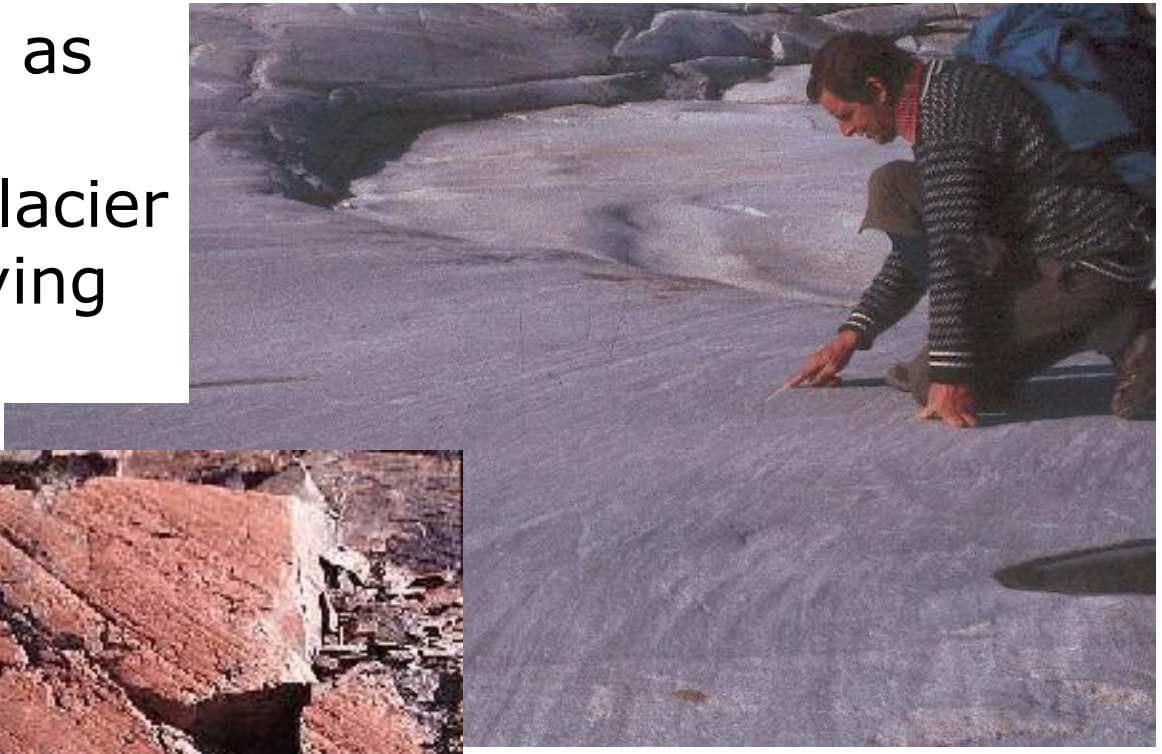
GLACIAL POLISH



Result of abrasion by sand at bottom of glacier

STRIATIONS

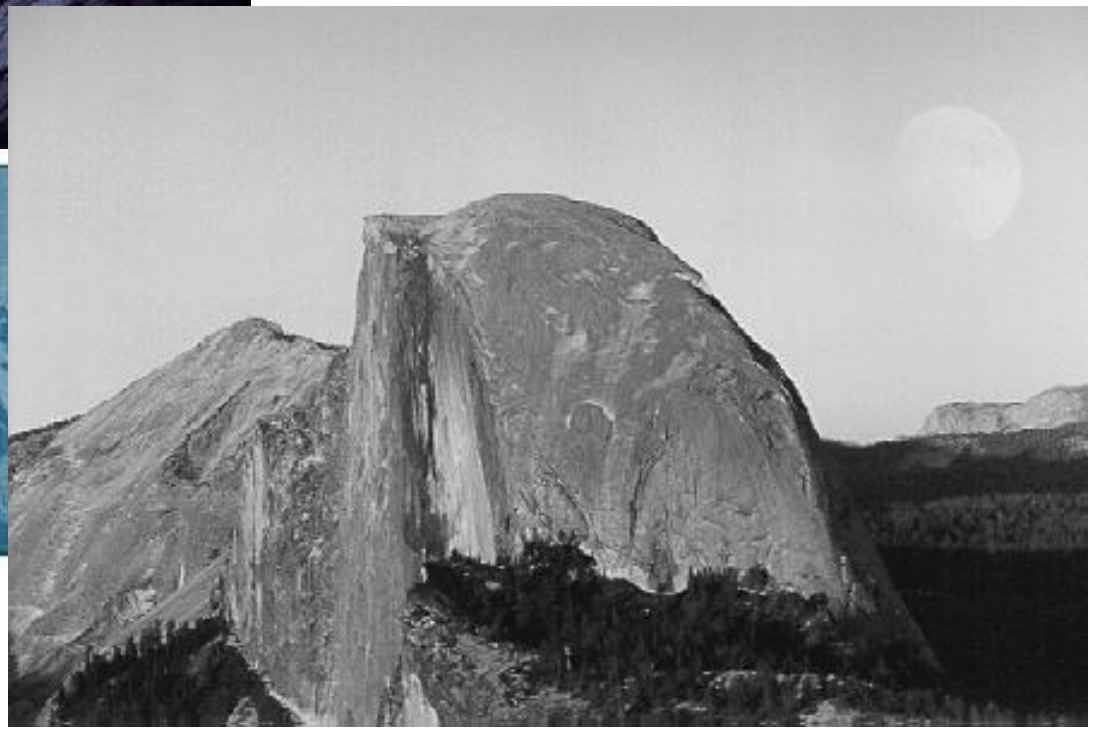
- lines etched in bedrock underlying glaciers as individual particles embedded in the glacier scratch the underlying bedrock.



- These lines indicate the orientation of Glacial flow.

•NUNATAK

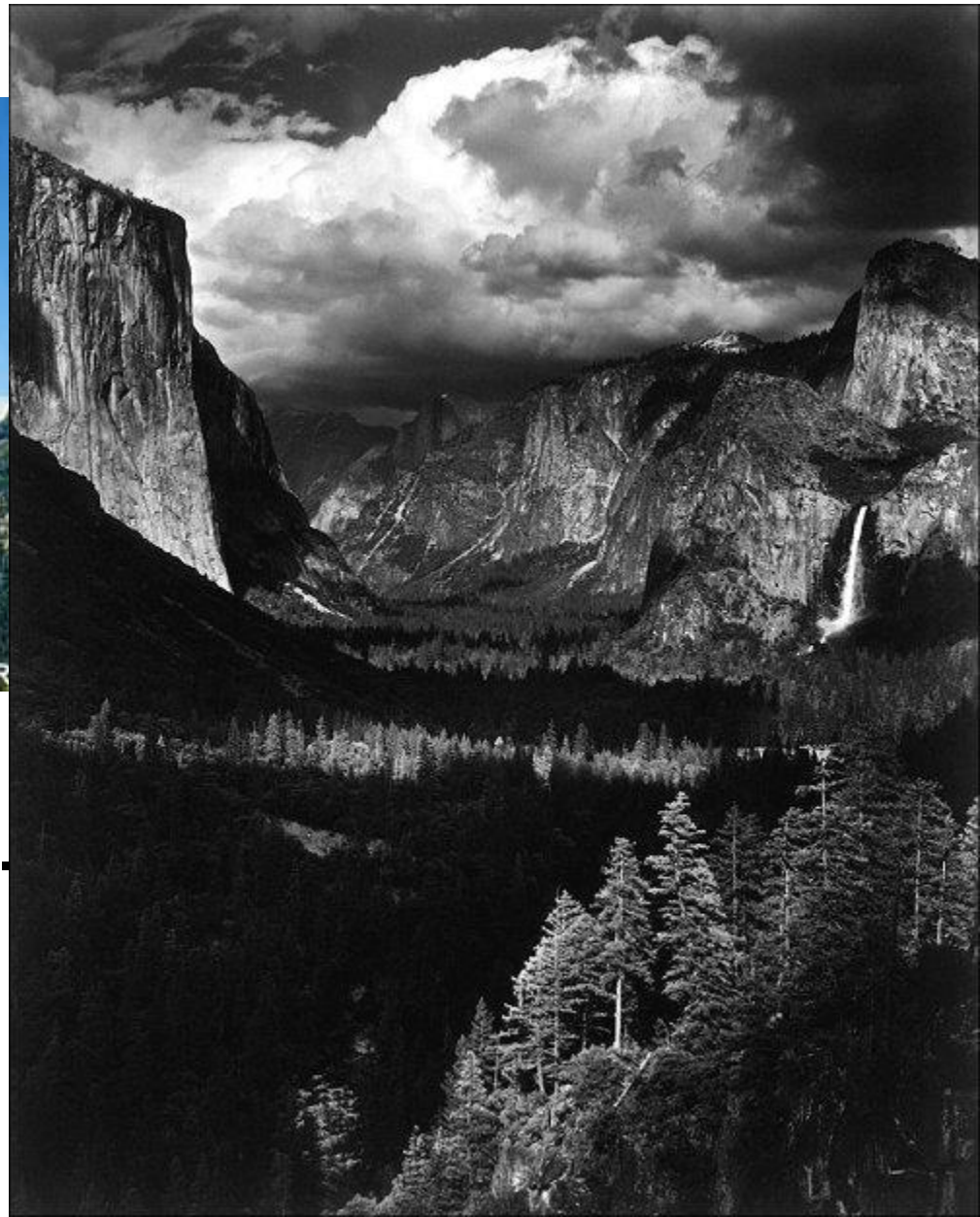
•Peak surrounded by glaciers but not itself glaciated



TARN

•a glacial lake produced by scouring.
• These are often found in cirques.

U-SHAPED VALLEY

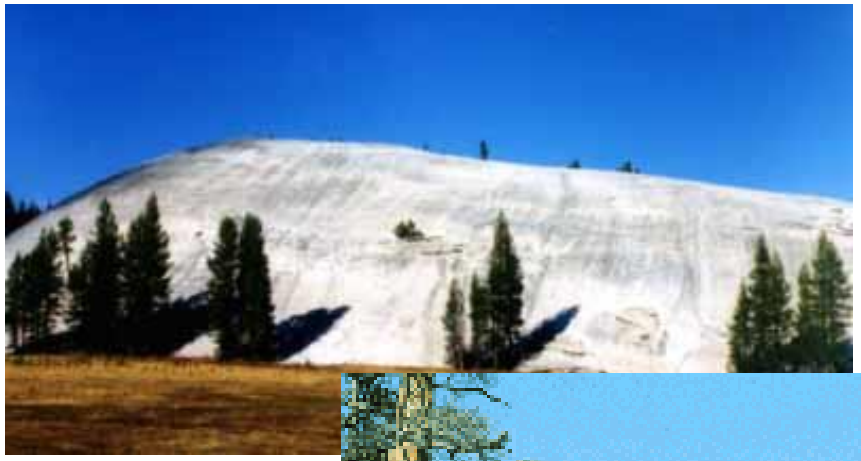


- a glacially eroded valley; also called a glacial trough.

PATERNOSTER LAKES

a chain of lakes in a glacial valley.

ROCHE MOUNTANEE



EROSIONAL LANDFORMS OVERVIEW

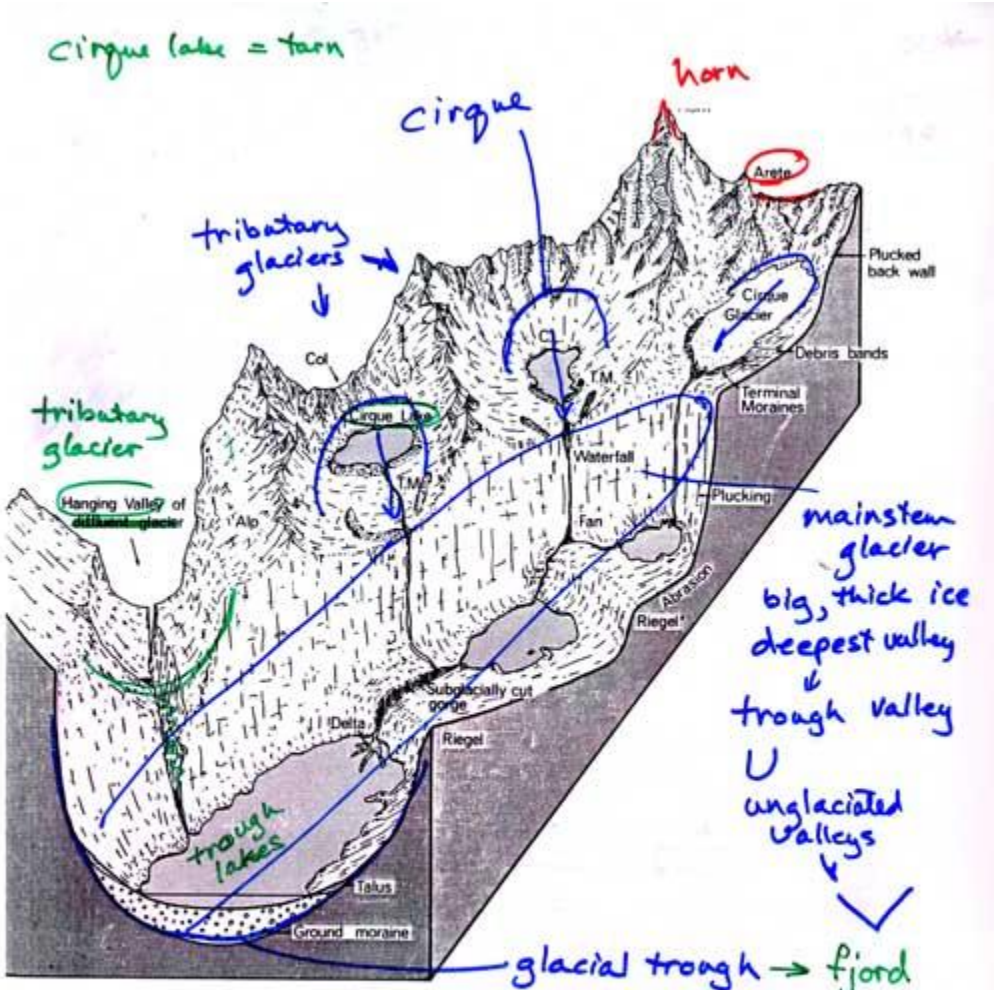
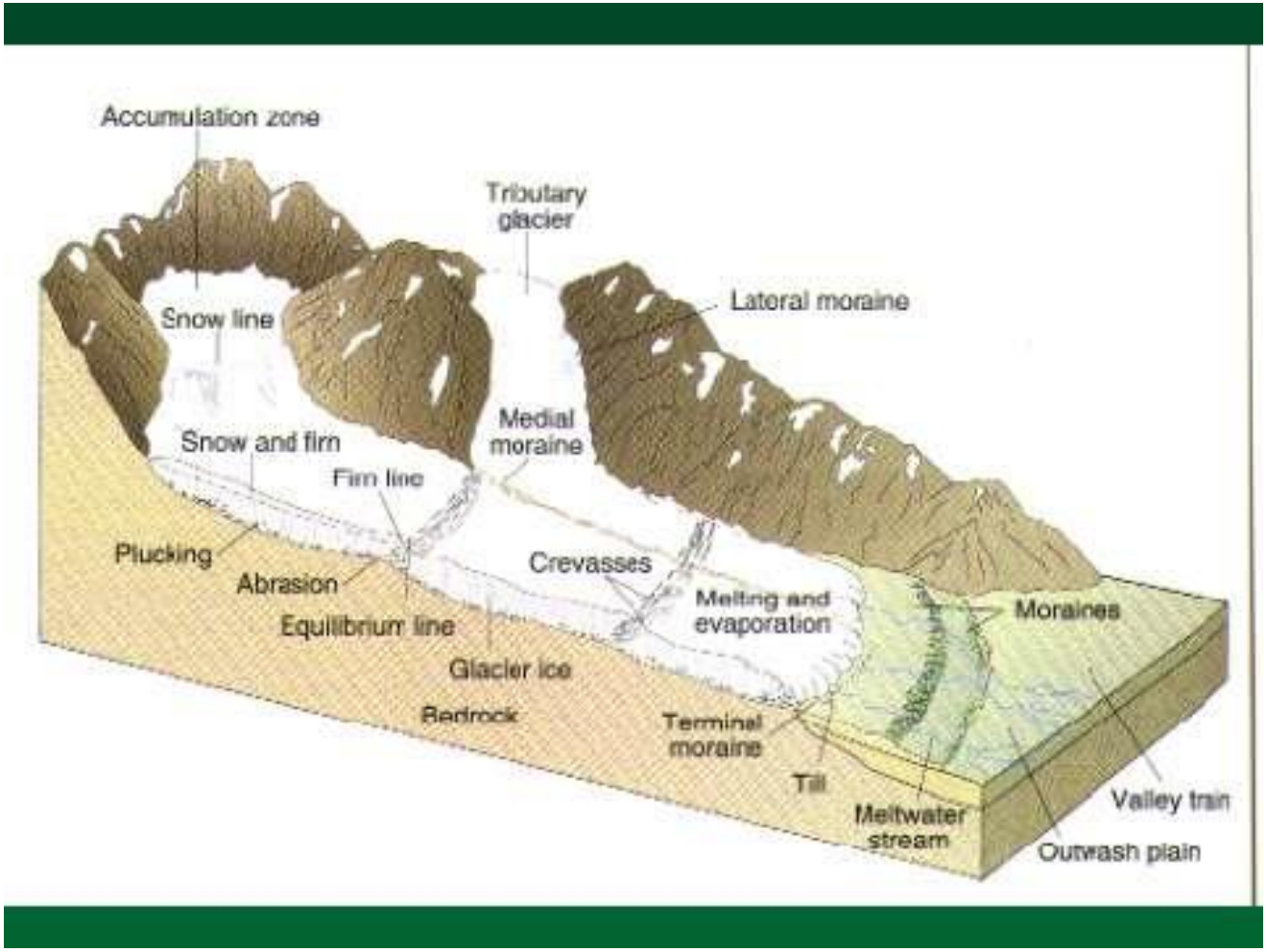


Fig. 15.15 Characteristic features of glacial erosion in an area of hard rocks and consequent steep valley walls. The main valley has few recessional moraines, but in the cirques minor cirque glacier expansion and retreat in the last 1000 years has left arcuate terminal moraines.

trough lakes are often moraine-dammed lakes

DEPOSITION LANDFORMS



DEPOSITION
Moraines

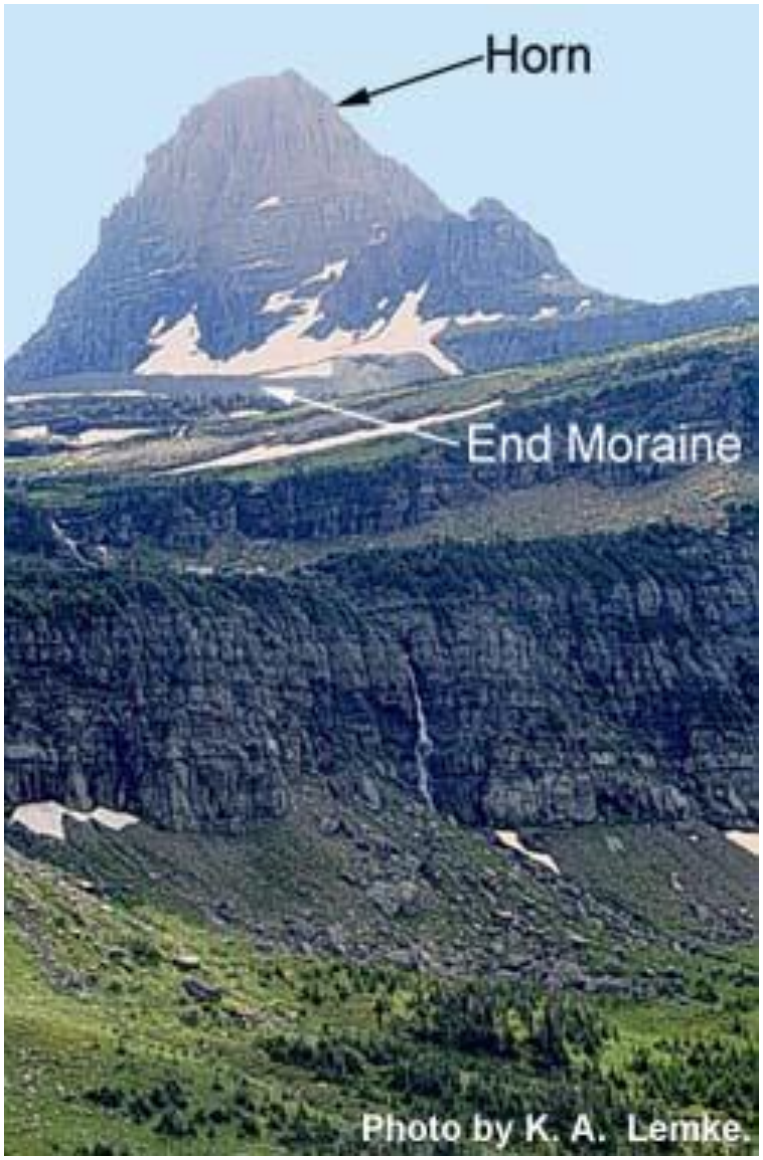
Moraine: an accumulation of unconsolidated material deposited by glaciers. These accumulations tend to be unsorted; that is, we find many different sized particles deposited in moraines, ranging from fine silt to large boulders. The sediment and rock material in moraines also tend to have angular edges.

There are many different types of moraines, and depending on the type, the appearance of moraines may vary.

TILL

- Unconsolidated glacial deposits that compose moraines.
- Nutrient-rich but poor soil texture for farming
- Much of NE USA

TERMINAL OR END MORAINE



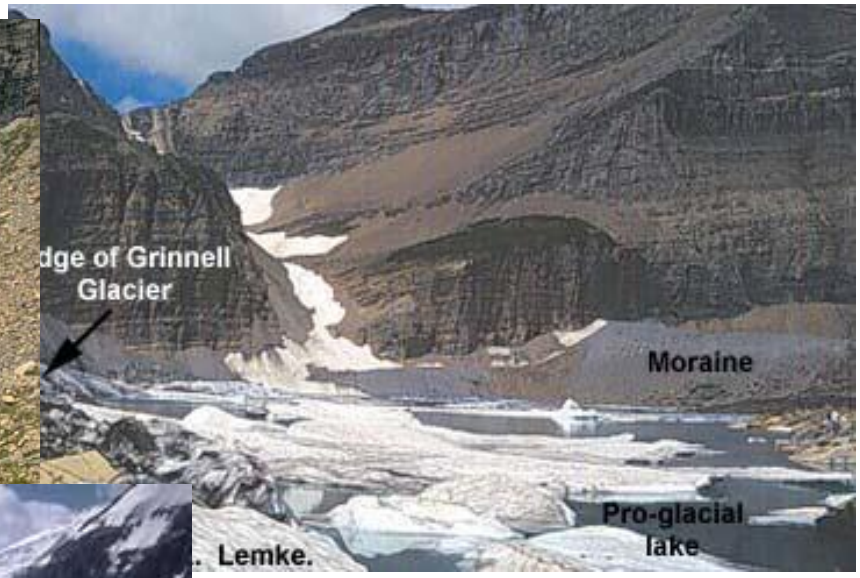
- an accumulation of unconsolidated material deposited at the snout end of a glacier
- Marks the furthest advance of a glacier
- Recessional moraines are end moraines caused as a glacier retreats

TERMINAL OR END MORAINE

GROUND MORAINE

unconsolidated material deposited directly beneath the base of a glacier.

LATERAL MORAINE

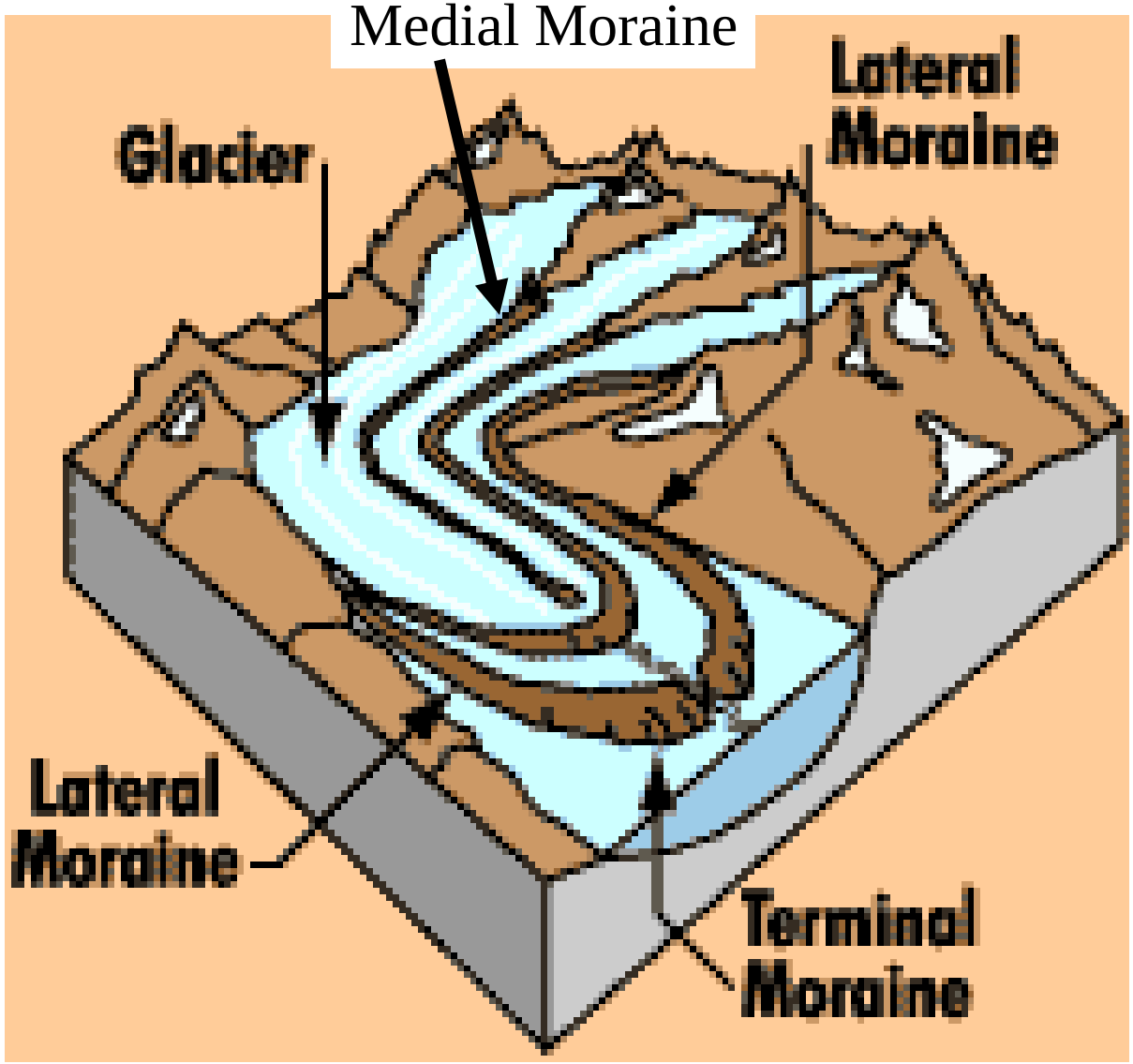


unconsolidated material deposited along the sides of an alpine glacier.

MEDIAL MORAINE

When two alpine glacier flow together, their lateral moraines join, forming a medial moraine

MORAINES: OVERVIEW



OUTWASH PLAIN

Debris deposited in front of glaciers. Often sorted.

KAME

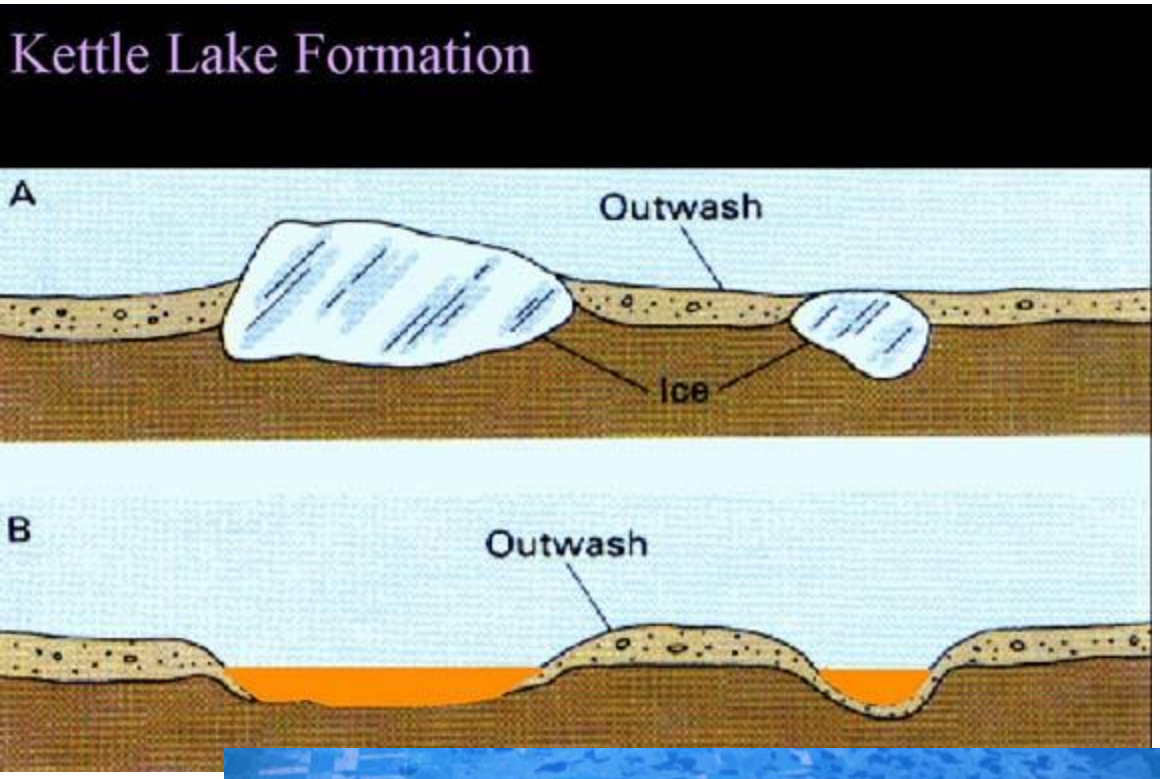
Caused by sediment deposition from water flowing through a moulin. Sediments more fine-textured than in glacial till.

Generally cone-shaped

ESKER

Long-sinuous ridge formed by sediment deposition in sub-glacial streams

Can you image a glacier over this esker
with a large stream flowing below the glacier?



KETTLE LAKES

- formed by melting ice chunks in glacial debris

ERRATICS

Large boulders left by glaciers in areas where they obviously don't belong.

Can be 10's to 100's of kilometers form point of origin