

EROSION BY GRAVITY

8.1

I. Erosion and Deposition

- a. Rivers look muddy when there is a lot of dirt and soil in them

- b. Muddy water is a product of erosion.

- c. The process of **erosion** wears away surface materials and moves them from one location to another.

- The major agents of erosion are gravity, glaciers, wind, and water.
- The agents of erosion have several things in common:
 - They wear away materials and carry them off
 - This only happens when they have enough energy of motion to do work
 - They all drop their load of sediments when their energy of motion decreases – called **deposition**
- Deposition is the final stage of an erosional process



Deposition: Soil and rock are carried away in the stream and then ***deposited*** as different soil and rock are picked up and moved.

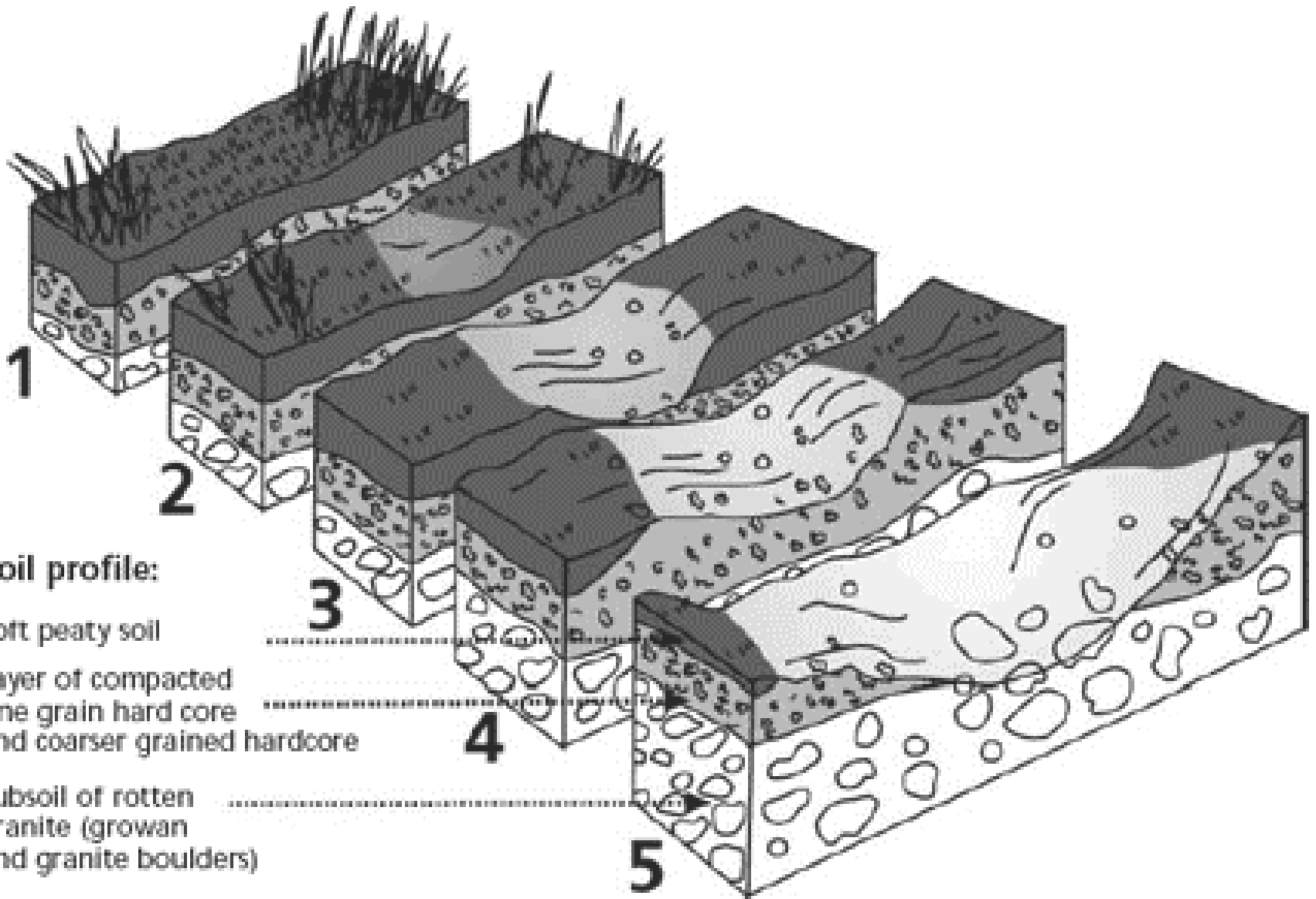
II. Erosion and Deposition of Gravity

A. Gravity is the force of attraction that exists between all objects.

- Because of earth's great mass – other objects are attracted to it

b. Gravity causes loose material to move down a slope

- When it is gravity alone that causes erosion it is called **mass movement**
 - Some mass movements are very slow – it is hard to tell that it is even happening
 - Others happen very quickly



Soil profile:

Soft peaty soil

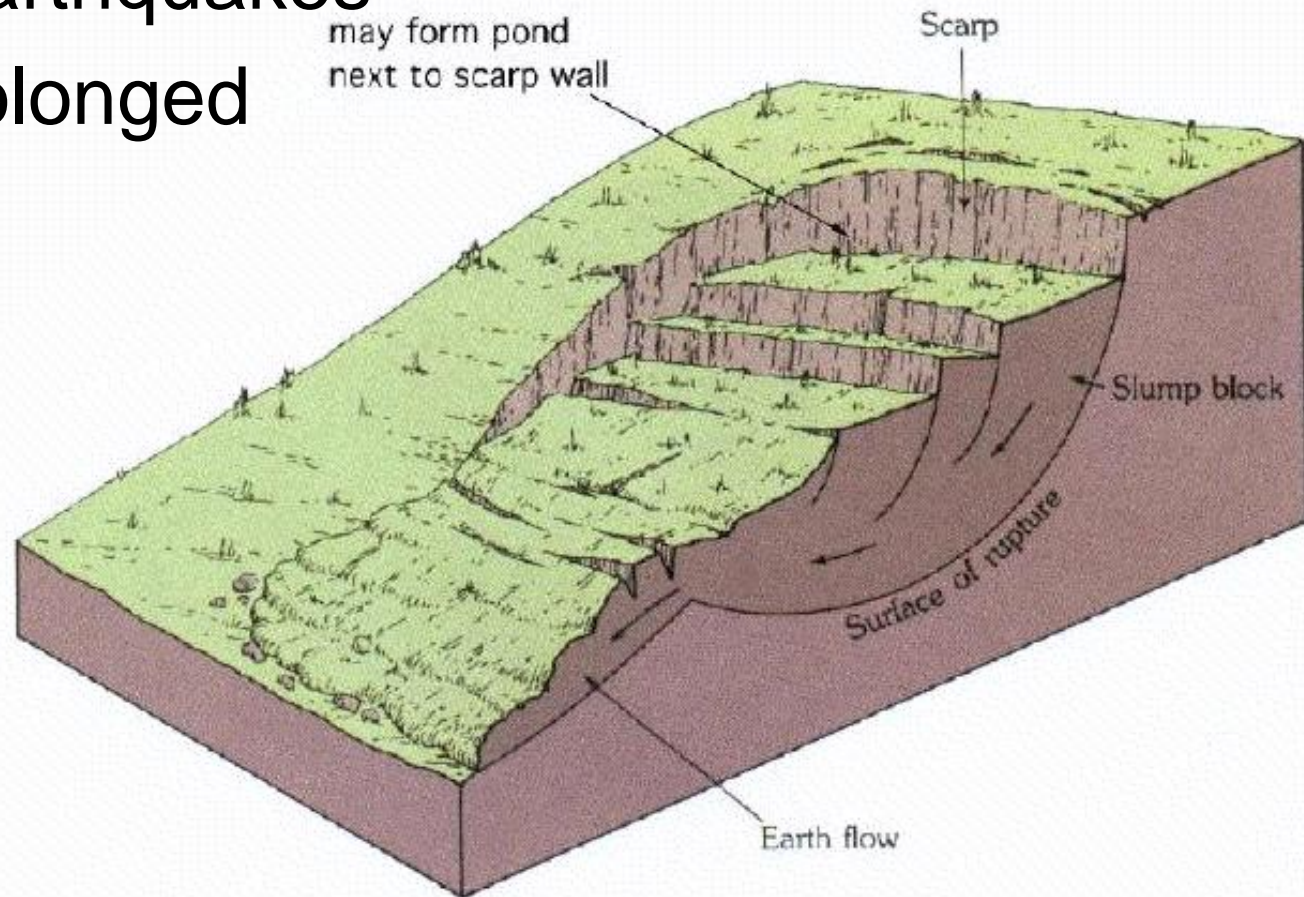
Layer of compacted
fine grain hard core
and coarser grained hardcore

Subsoil of rotten
granite (growan
and granite boulders)

A. Slump

1. A *slump* is a mass movement that happens when loose materials or rock layers slip down a slope.
 - Strong rock or sediment lies over weaker materials and when the underlying material can no longer hold the rock and sediments they slip downward in a large mass
 - Water can also cause this to occur when water and mud build up

2. A curved scar is left where the slumped materials originally rested
3. Slumps happen most often after earthquakes or heavy, prolonged rain



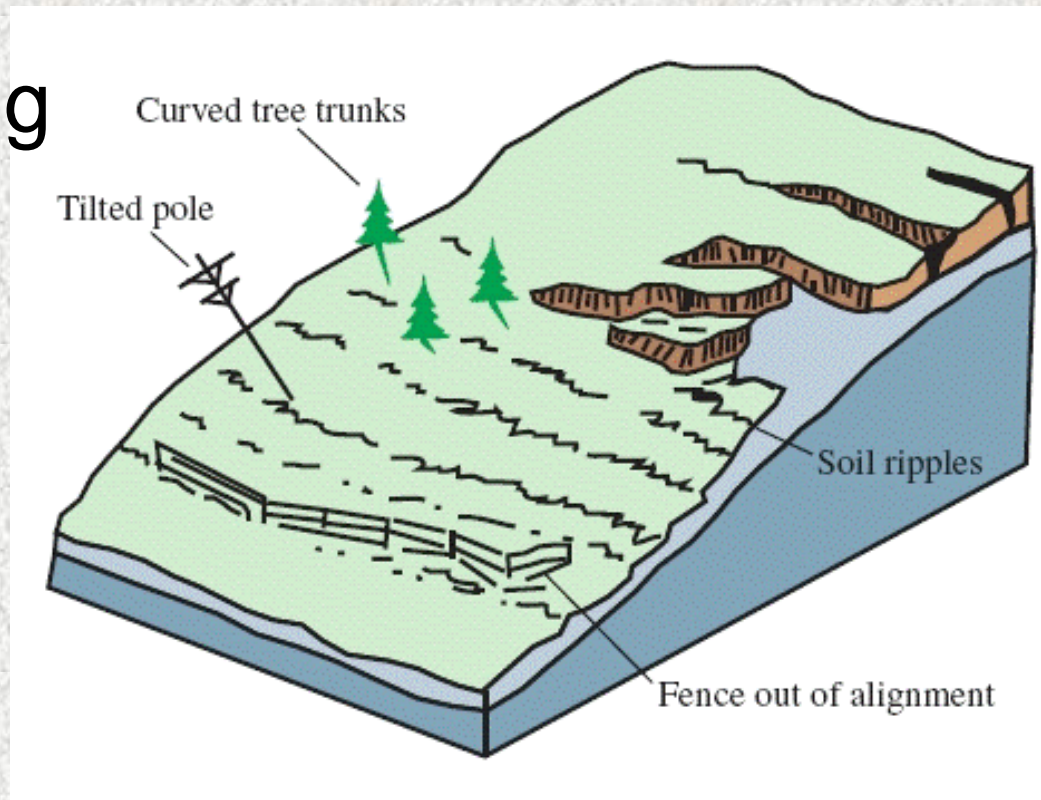
Slump



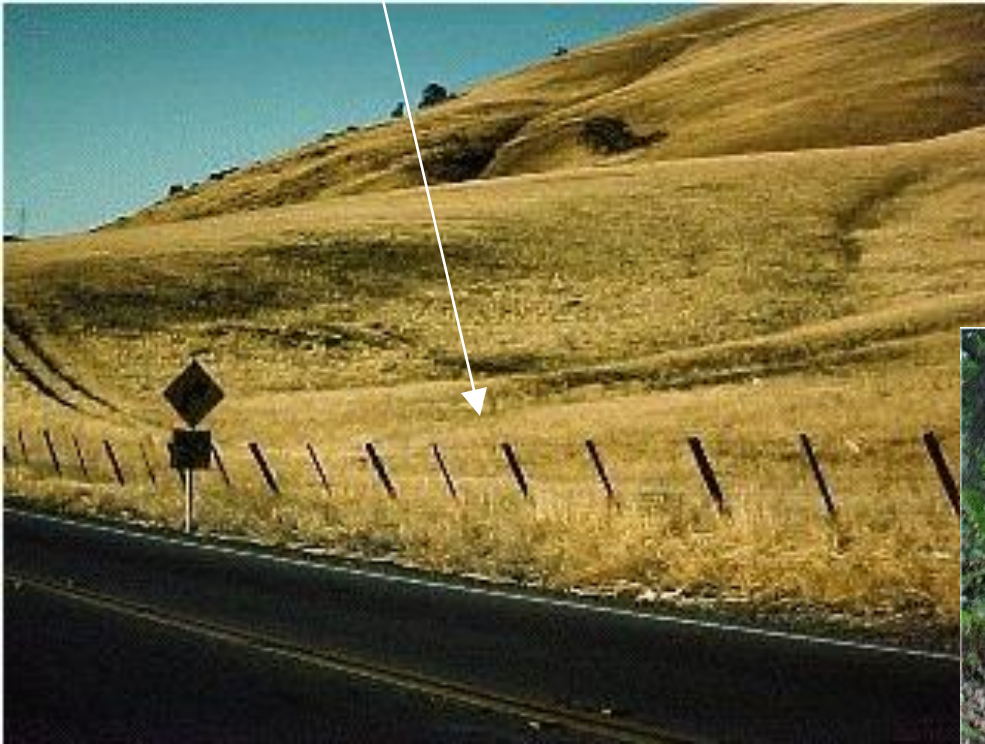
B. Creep

1. Creep is when sediments slowly inch their way down a hill

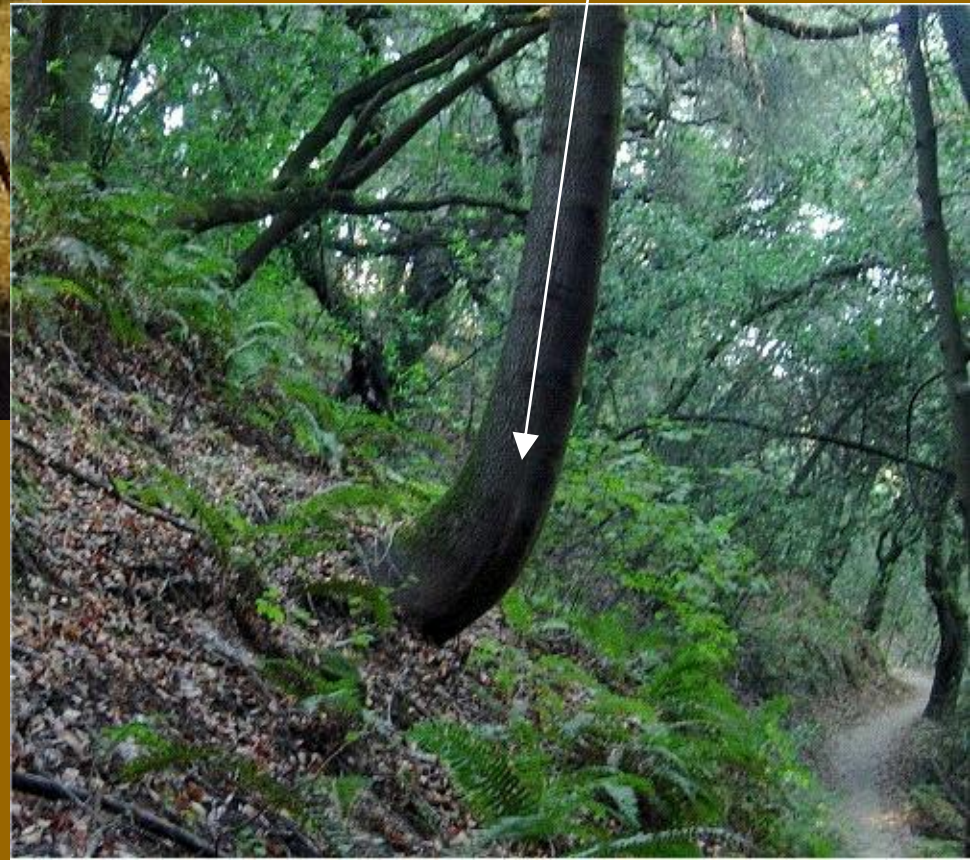
2. Creep is common in areas of freezing and thawing



Fence Poles Tilted



Curved Tree



Creep

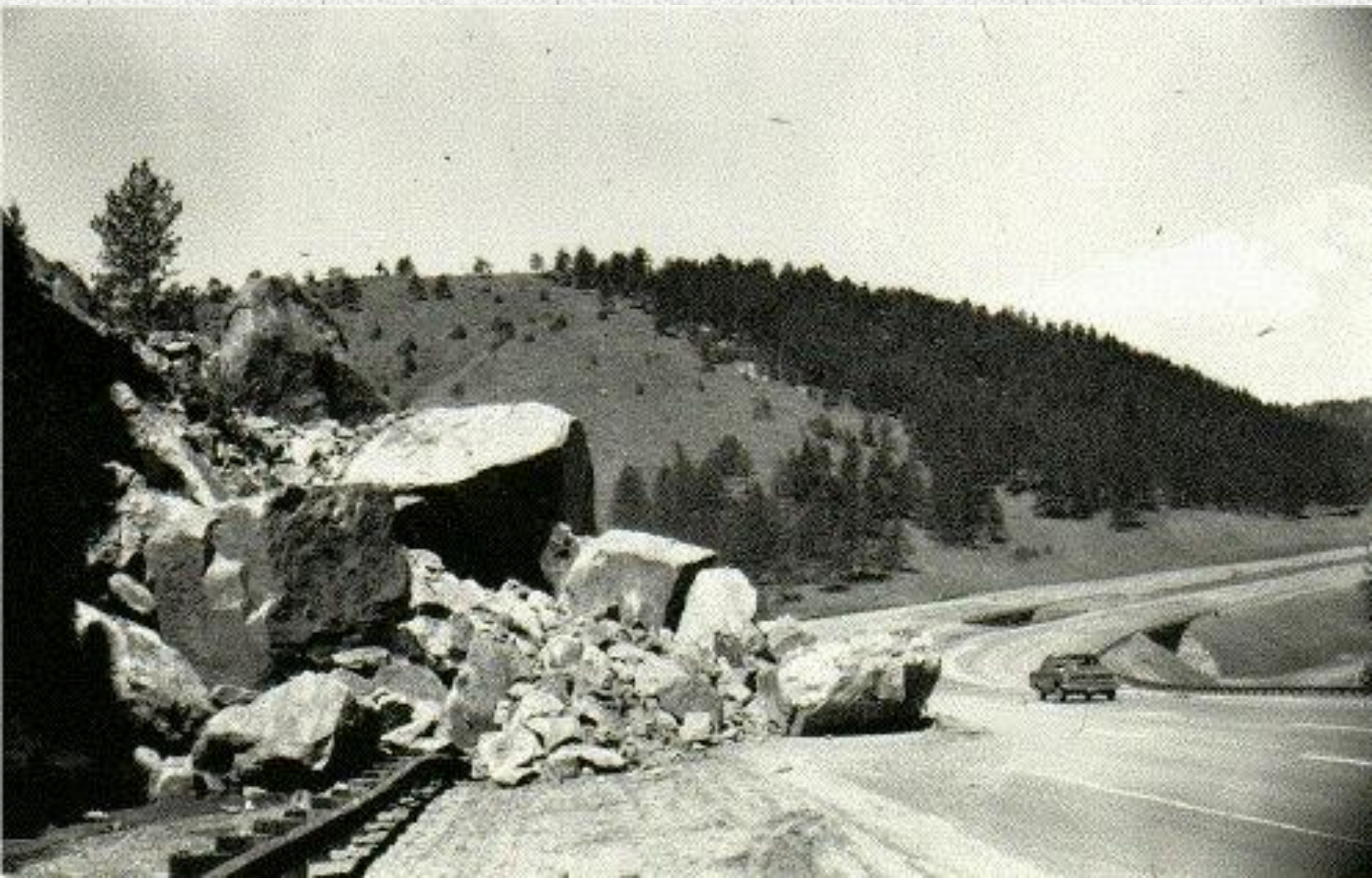
C. Rockslides

1. ***Rockslides*** happen when large blocks of rock break loose from a steep slope and start tumbling.
2. As they fall they hit other rocks and knock them loose as well
 - More and more rocks break loose and move towards the bottom

3. Rockslides happen very fast and can be very destructive in populated mountainous areas
 - a. They commonly occur in mountainous areas or where there are steep cliffs
 - b. They happen most often after heavy rain falls or during earthquakes
 - But they can happen on any rocky slope at anytime – without warning

Rock Slide





D. Mudflows

1. A *mudflow* is a thick mixture of sediments and water flowing down a slope
2. Mudflows usually occur in relatively dry areas where weathering accumulates thick layers of dry sediments

- a. When heavy rains fall in these areas, water and sediments mix to form a thick and pasty substance
- b. Gravity causes the mass to slide downhill
- c. When it reaches the bottom it loses its energy of motion and deposits all the sediments it has been carrying – usually spreading out in a cone or fan shape

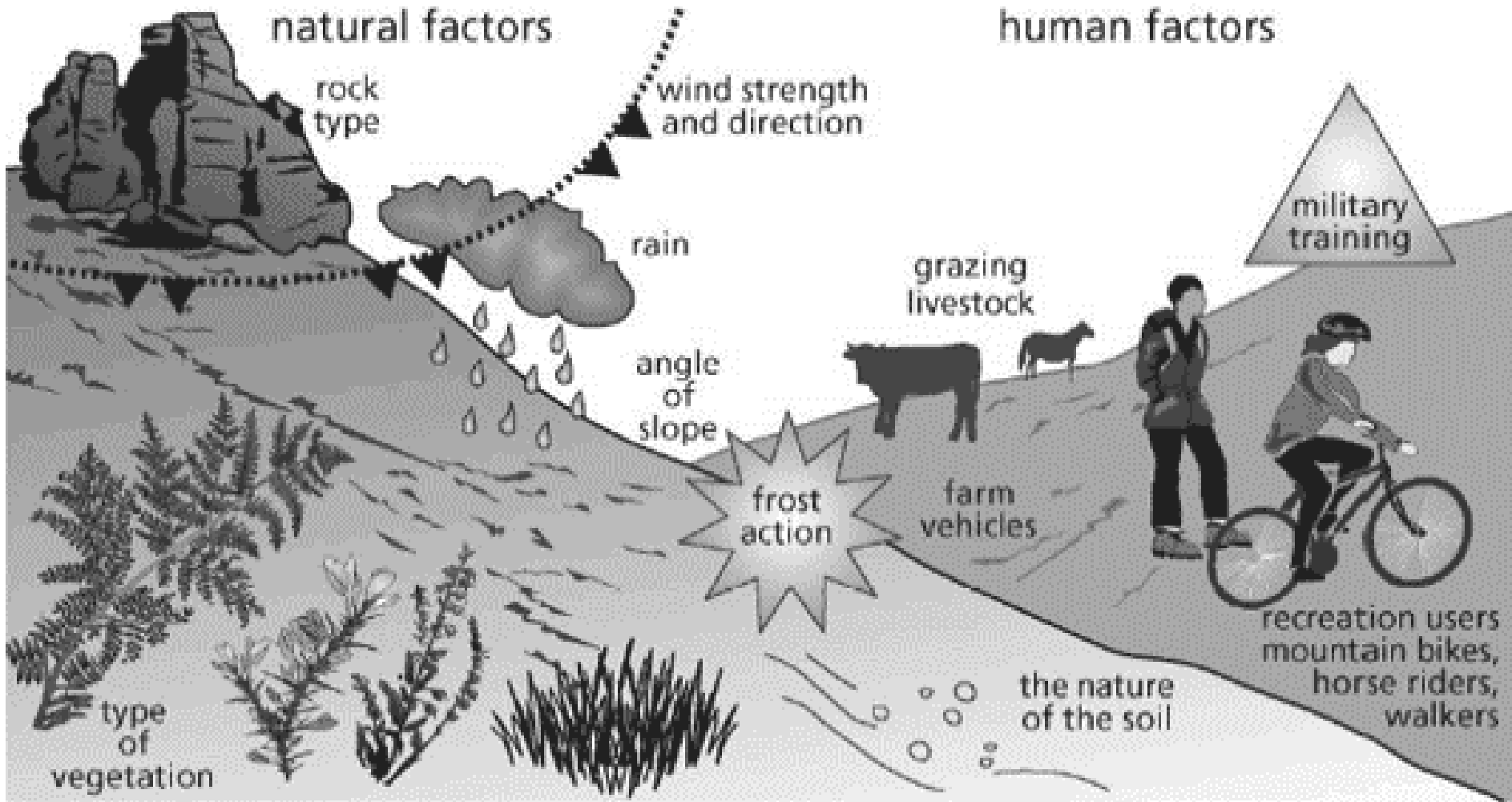
Mud Flow



Mud Flows



Erosion



III. Conclusion

- a. Mass movements (mudflows, rockslides, creep, and slump) are all similar in that they:
- Are more likely to happen on steep slopes
 - They all depend on gravity to make them happen
 - They most often occur after a heavy rain
 - They all erode sediments from the top of a slope and deposit them at the bottom
 - The results of mass movements is that it constantly changes the shape of a slope so that it is less steep