

Karst Processes

Karst are defined as terrain with distinctive characteristics of relief and drainage arising primarily from a higher degree of rock solubility in natural water than is found elsewhere.

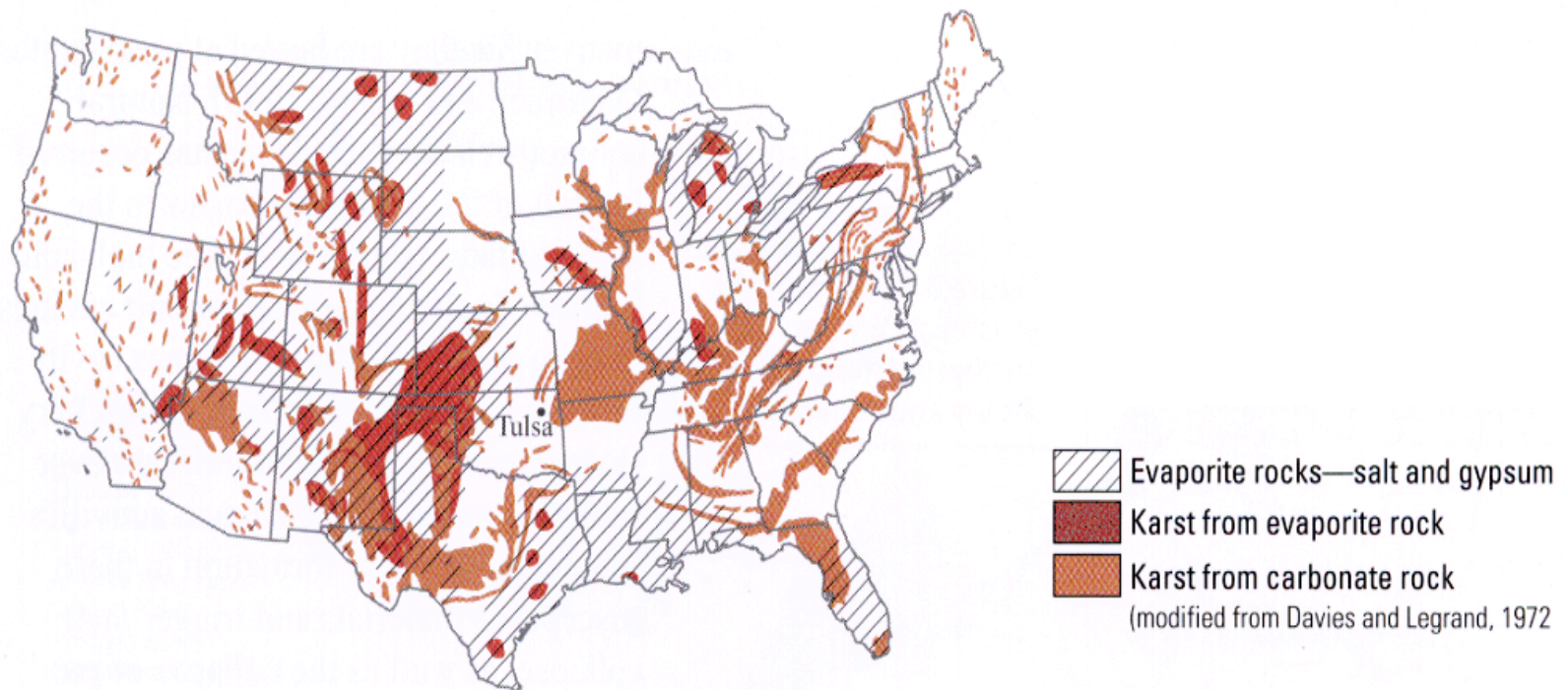


Karst Processes



Karst Processes

Karstlands



Karst Processes

Resisting Framework

Lithology - Limestones show great variability due to their definition.

- A limestone is a rock containing at least 50% carbonate mineral,
- The two most common carbonate minerals in limestone are a low magnesium (1-4%) calcite and dolomite.
- The purer the limestone is with respect to calcite, the greater tendency to form karst.
- Dolomites and evaporites such as gypsum and halite are also prone to karstification.

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Resisting Framework

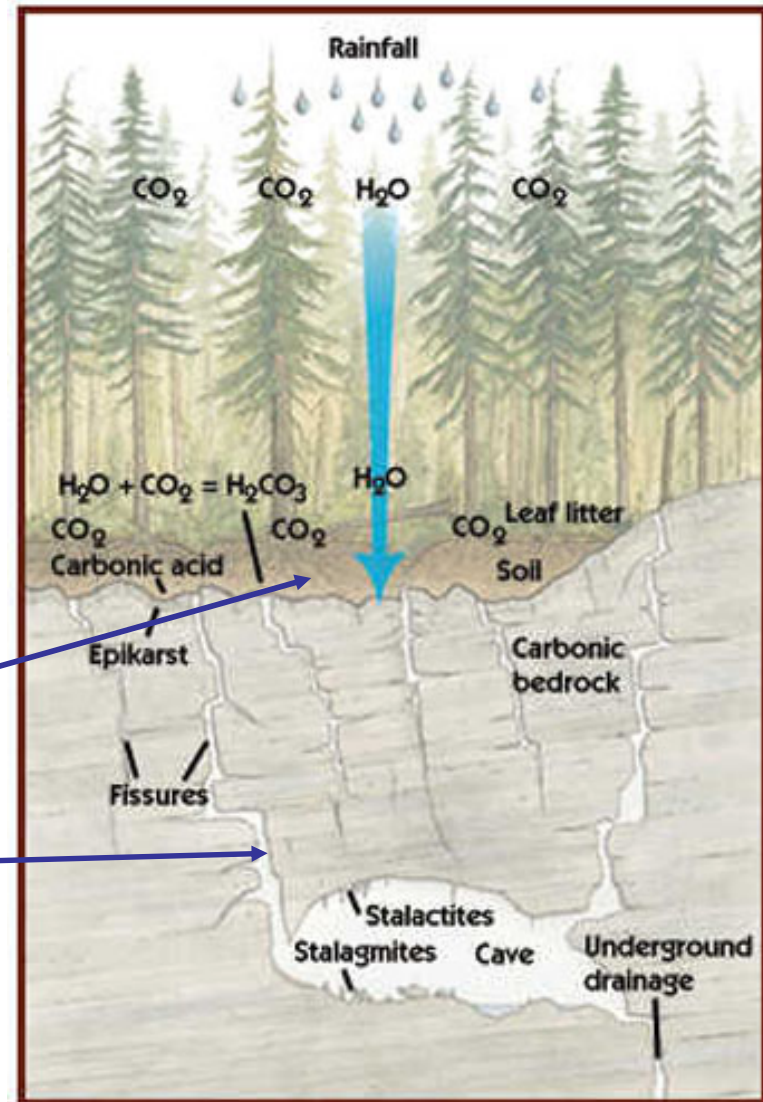
Porosity and Permeability

$$P = (V_v / V) \times 100$$

where P is porosity,
 V_v is volume of voids, and
V is total volume of material.

Two types of porosity:

- *Primary porosity*
- *Secondary porosity*



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Resisting Framework

Secondary Porosity



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Resisting Framework

Secondary Porosity

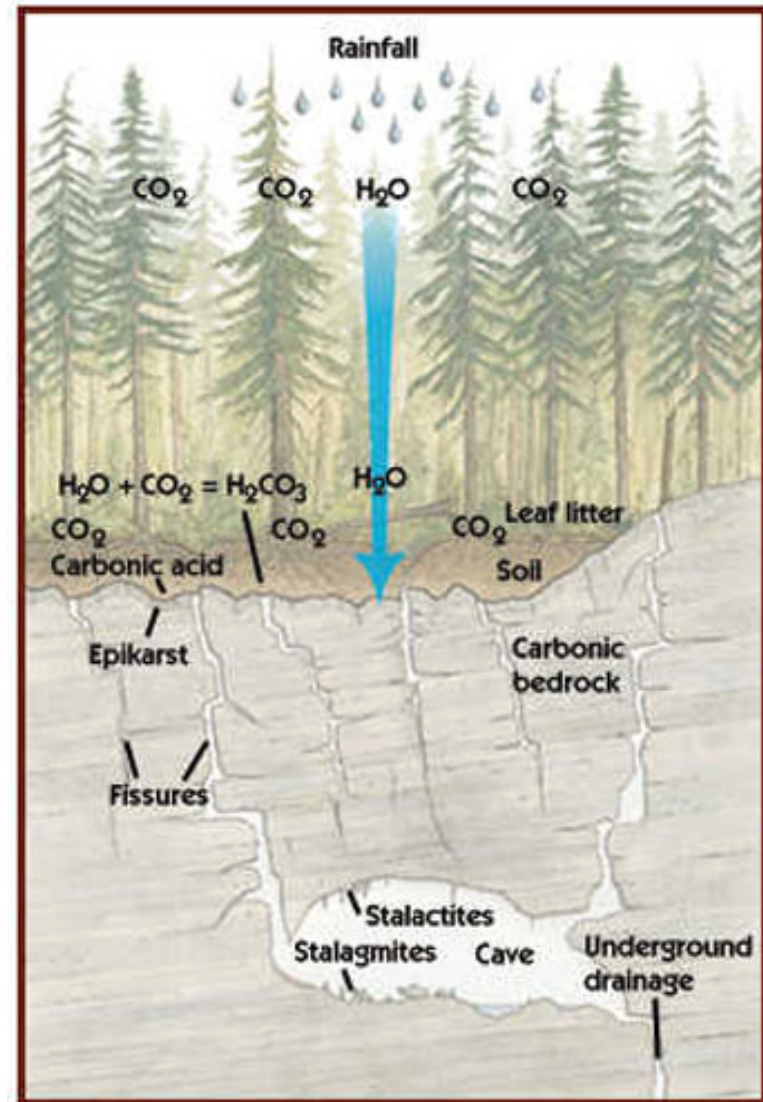


Foto Eje Rosen

Karst Processes

Driving Mechanics and Controls

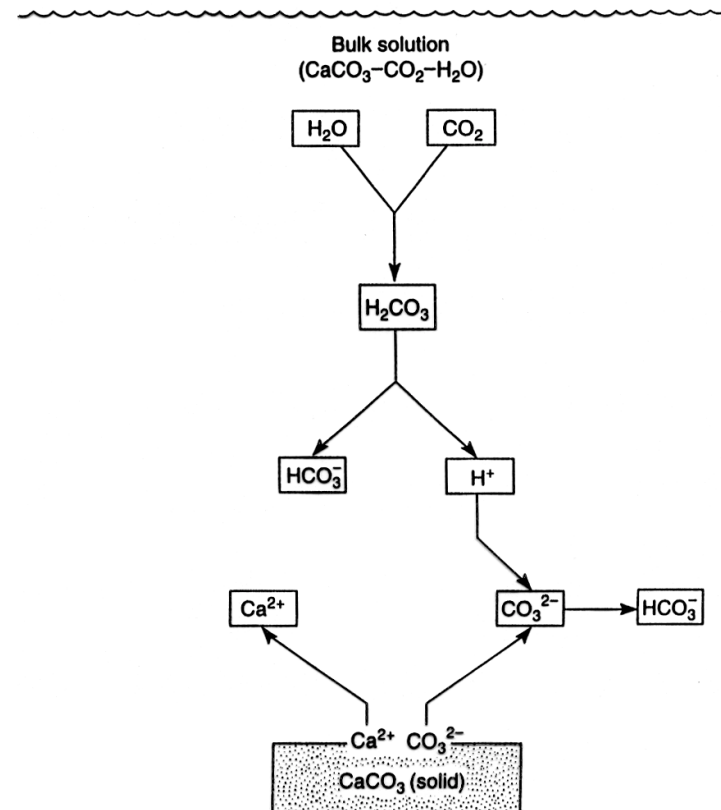
Climate, Vegetation, and Biogenic CO₂



Karst Processes

Driving Mechanics and Controls

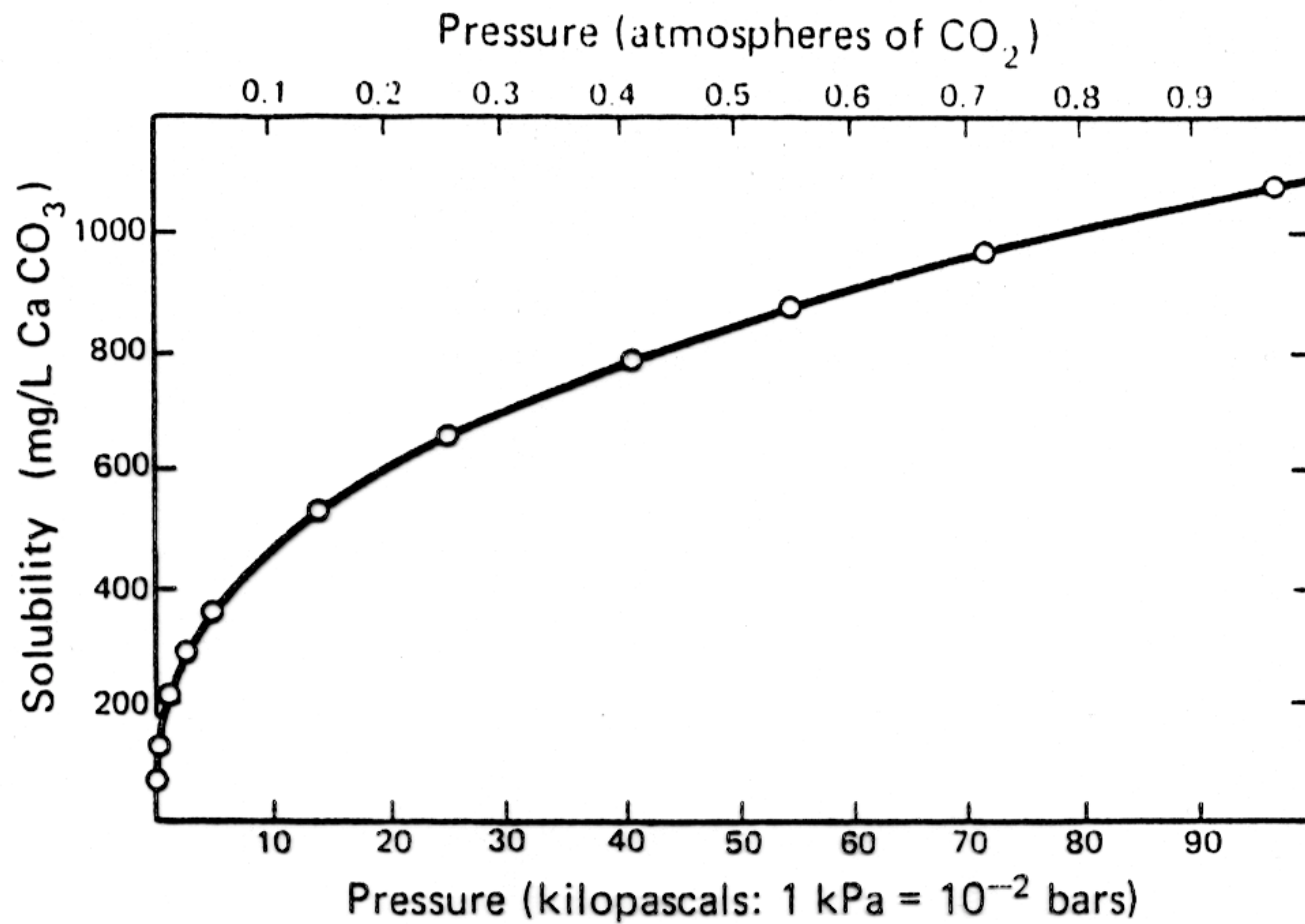
The Solution Process



Karst Processes

Driving Mechanics and Controls

The Solution Process



Karst Processes

Driving Mechanics and Controls

The Solution Process

$$S = C * Q$$

Where:

S is solution,

C is the solute

concentration and

Q is stream discharge.

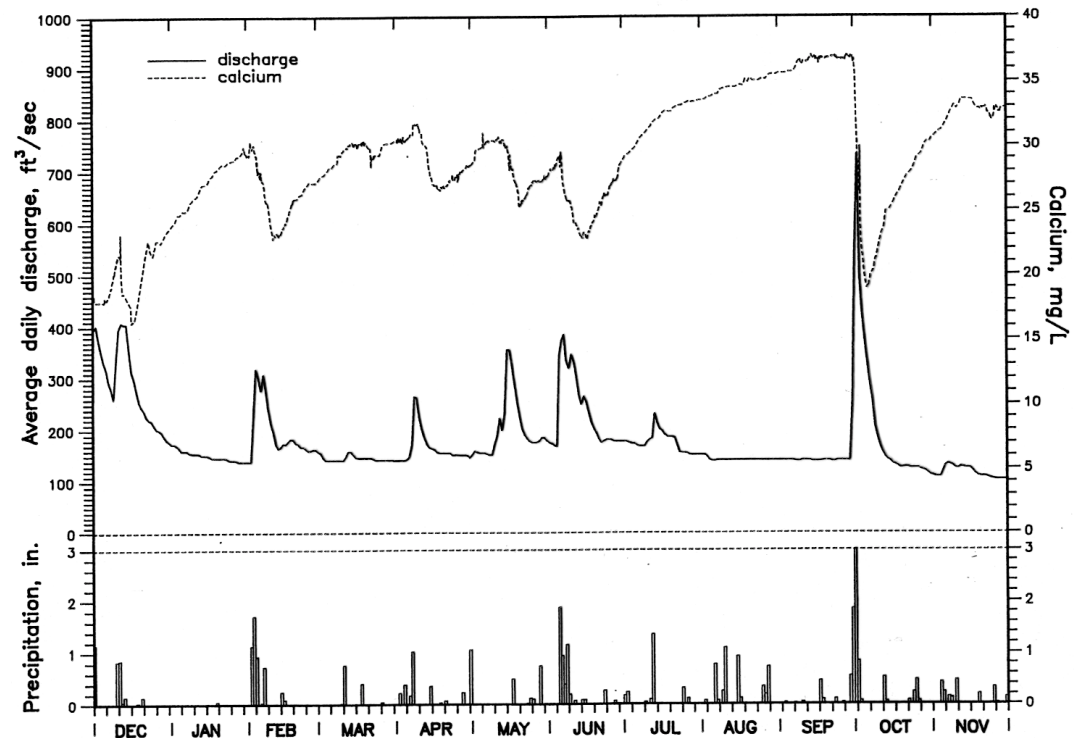


Figure 30. The effects of precipitation on discharge and calcium concentrations at Maramec Spring, December 1985 through November 1986.

Karst Processes

Karst Hydrology and Drainage Characteristics

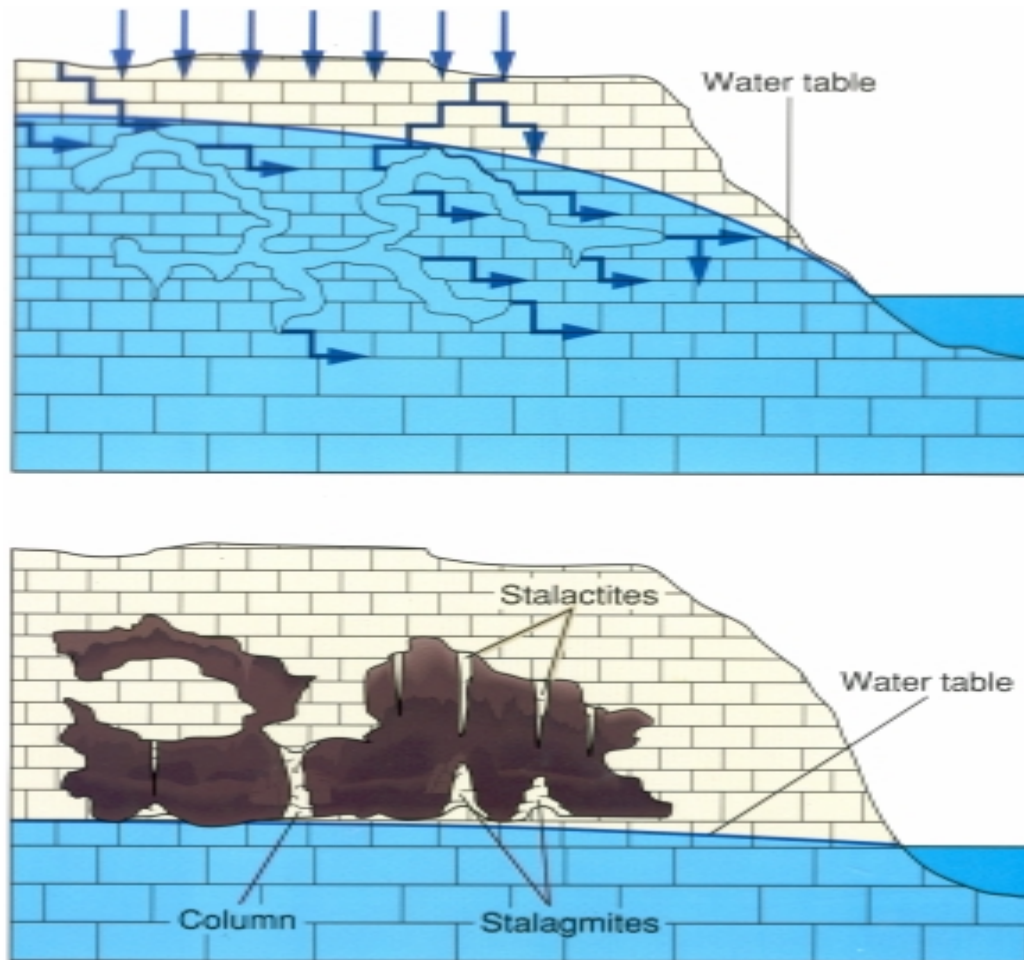
Surface Flow - Rivers lose water when some of the flow descends into swallow holes or **swallets**.



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Karst Hydrology and Drainage Characteristics

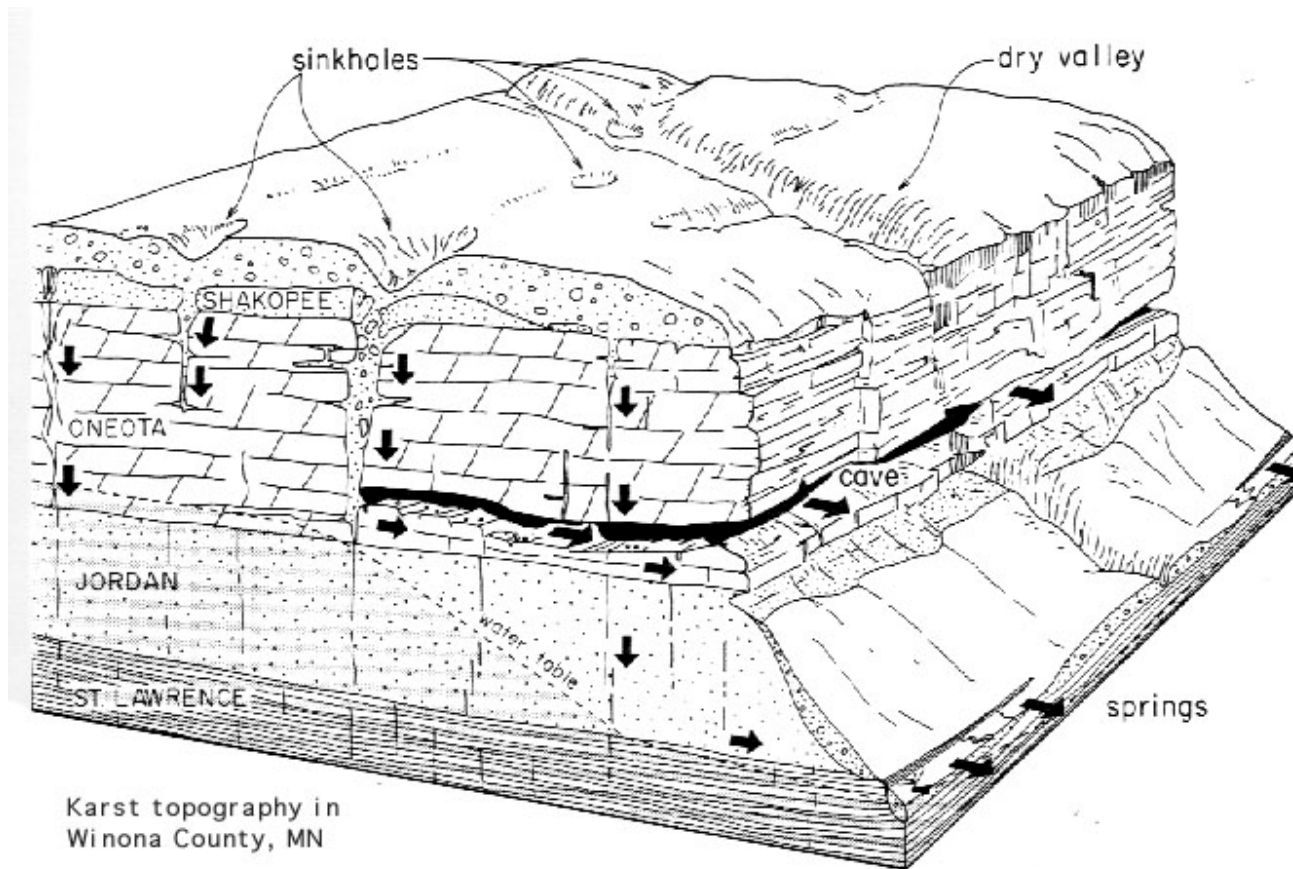
Karst Aquifers and Groundwater



Karst Processes

Karst Hydrology and Drainage Characteristics

Karst Aquifers and Groundwater



Karst Processes

Karst Hydrology and Drainage Characteristics

Surface and Groundwater Connection

- Shafts

- Springs

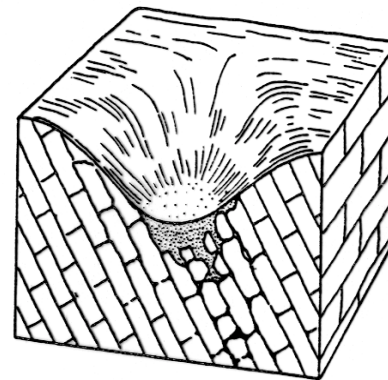


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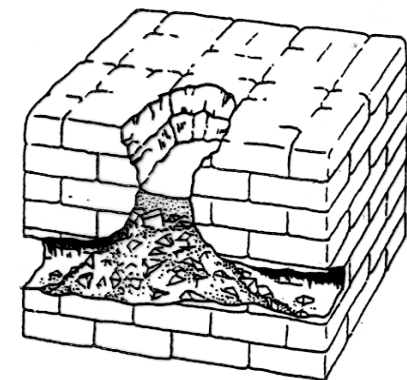
Karst Landforms

Closed Depressions - Dolines

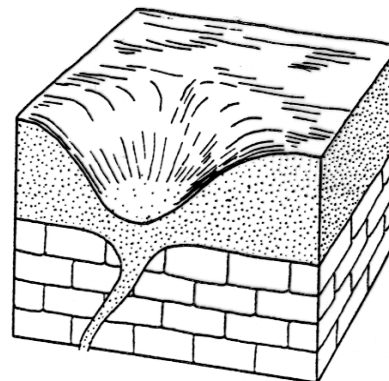
- *Solutional*
- *Collapse*
- *Subsidence*



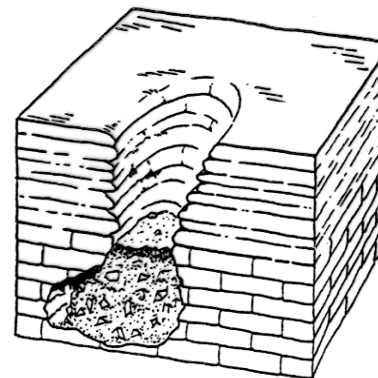
(a) Solution doline (funnel sink)



(b) Collapse doline



(c) Subsidence doline



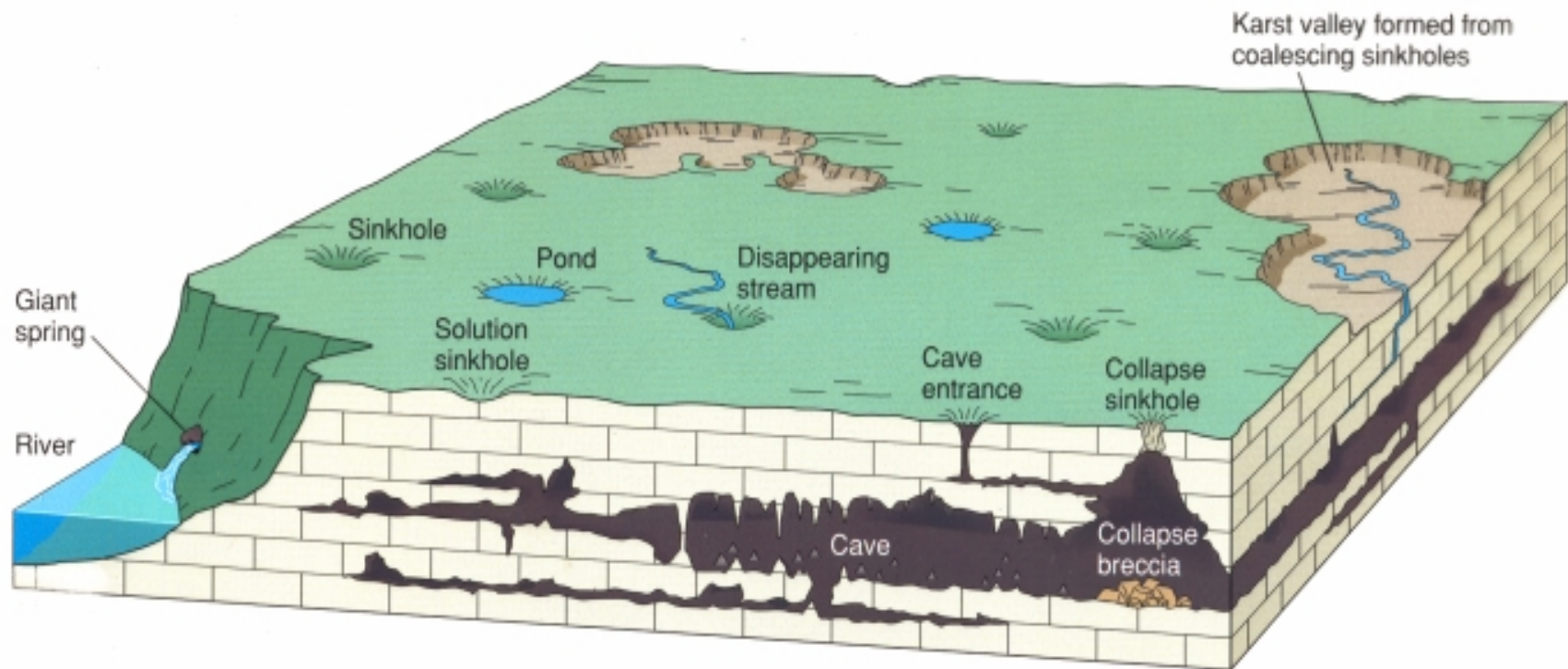
(d) Subjacent karst collapse doline



(e) Cockpits (intersecting star-shaped dolines)

Karst Processes

Karst Landforms



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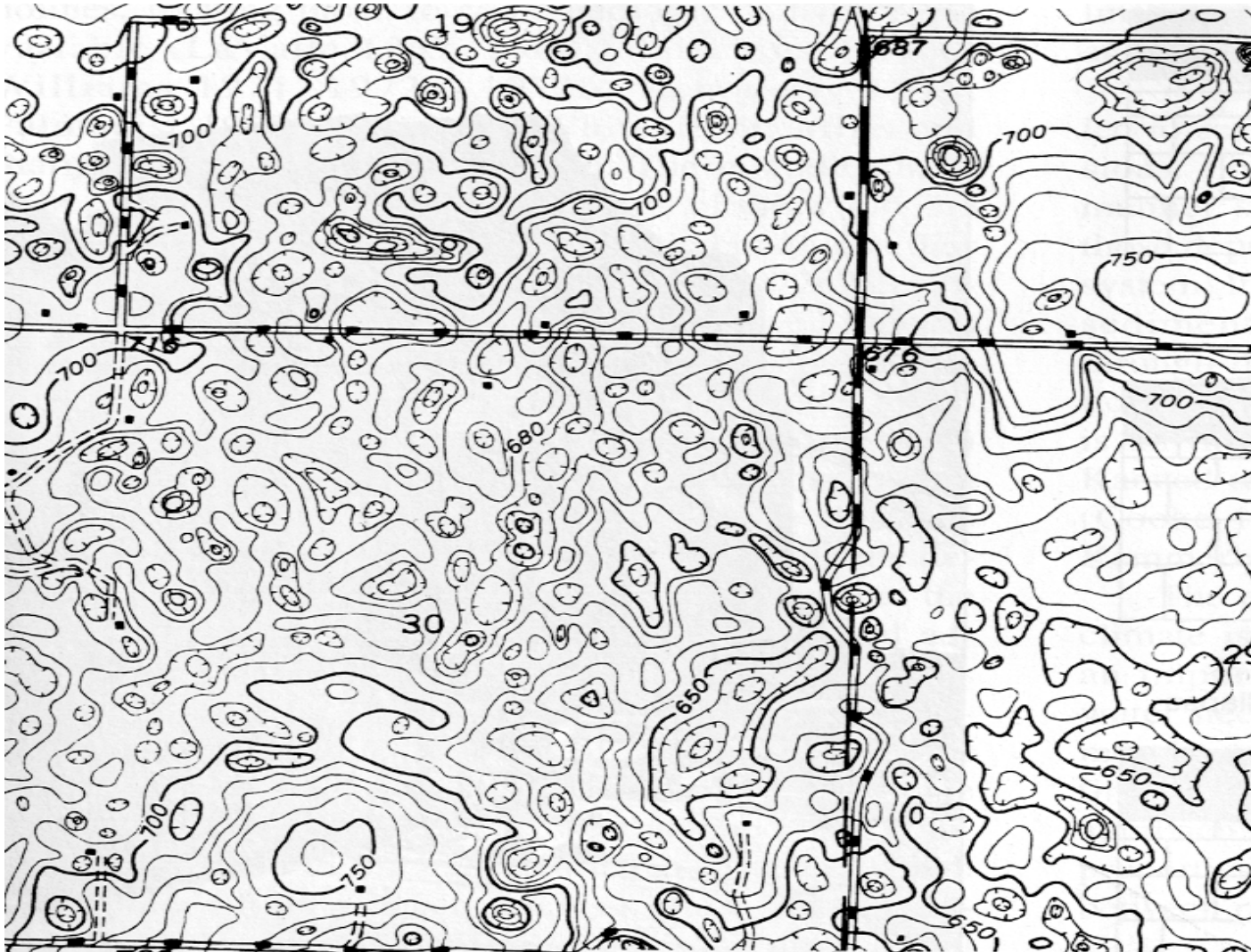
Karst Processes

Karst Landforms



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Karst Landforms

Allogenic Valleys

Torn Gorge in the Grand Caucasses
area of France.

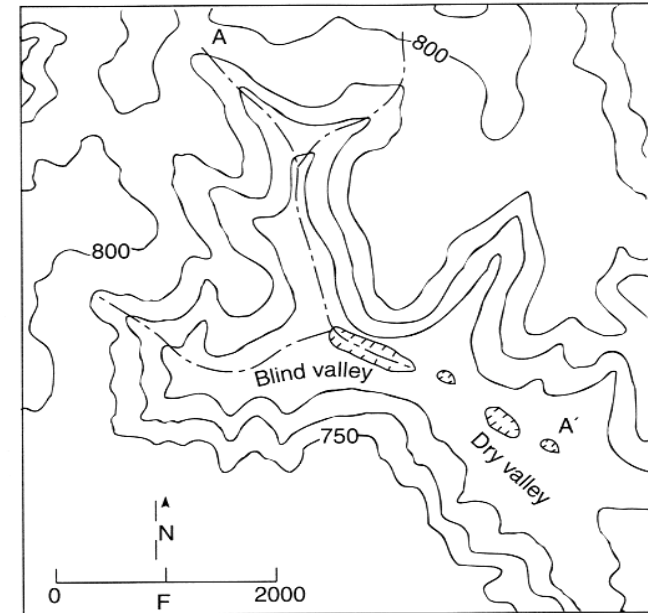


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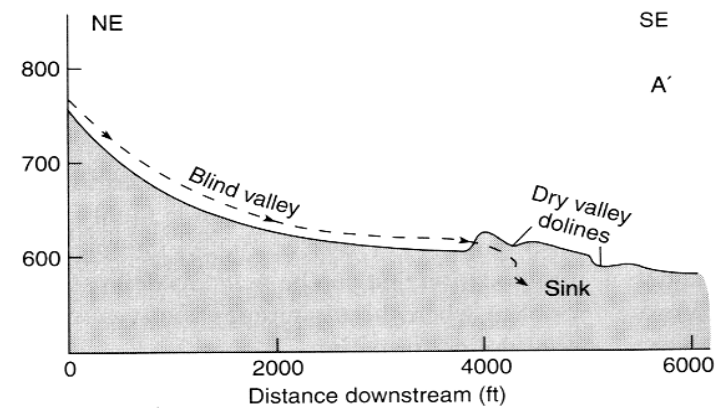
Karst Landforms

Blind and Dry Valleys

Pocket Valleys



(A)



(B)

Karst Processes

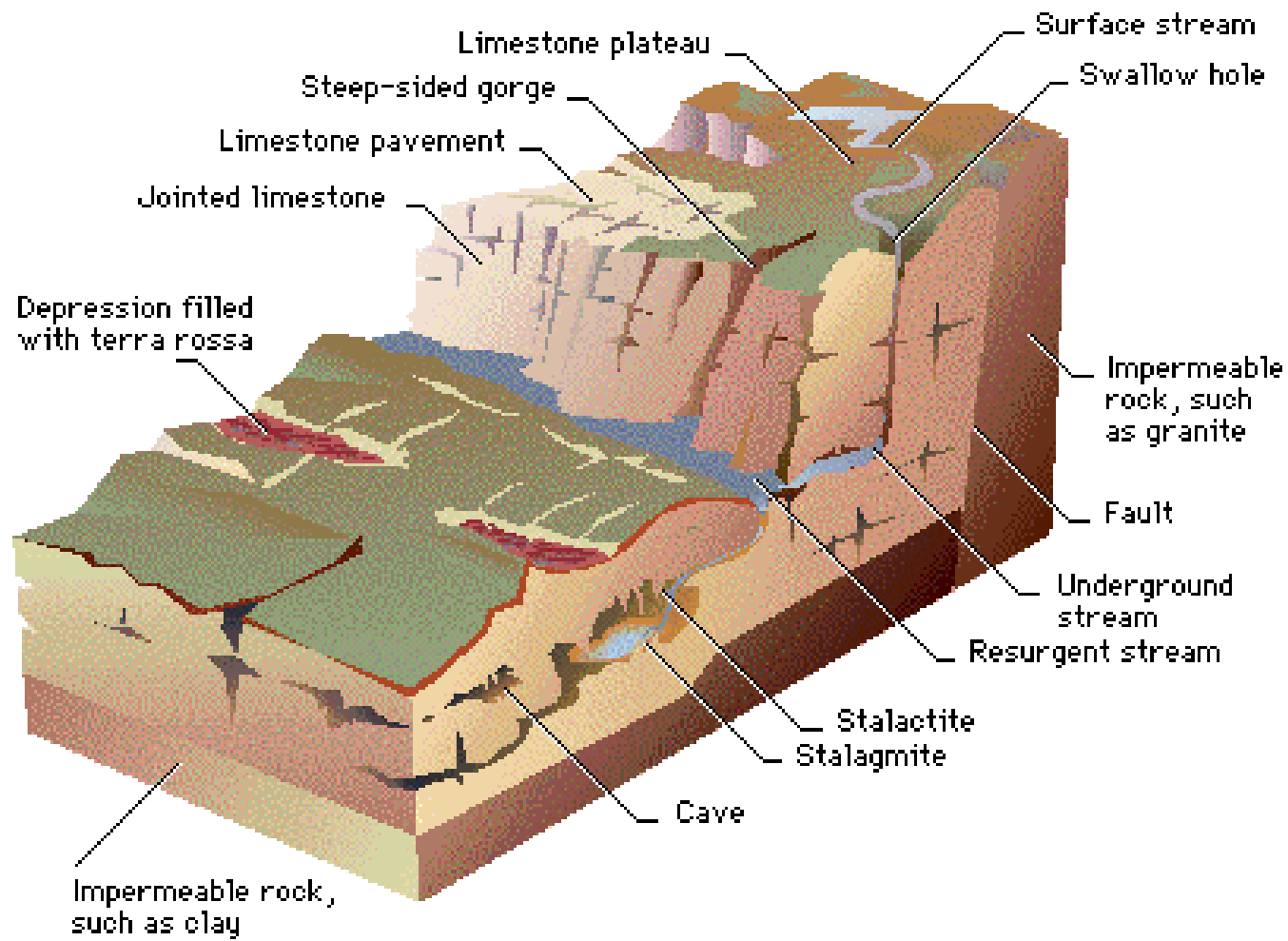
Tropical Karst

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Karst Processes

Limestone Caves



Karst Processes

Limestone Caves



Karst Processes

Limestone Caves

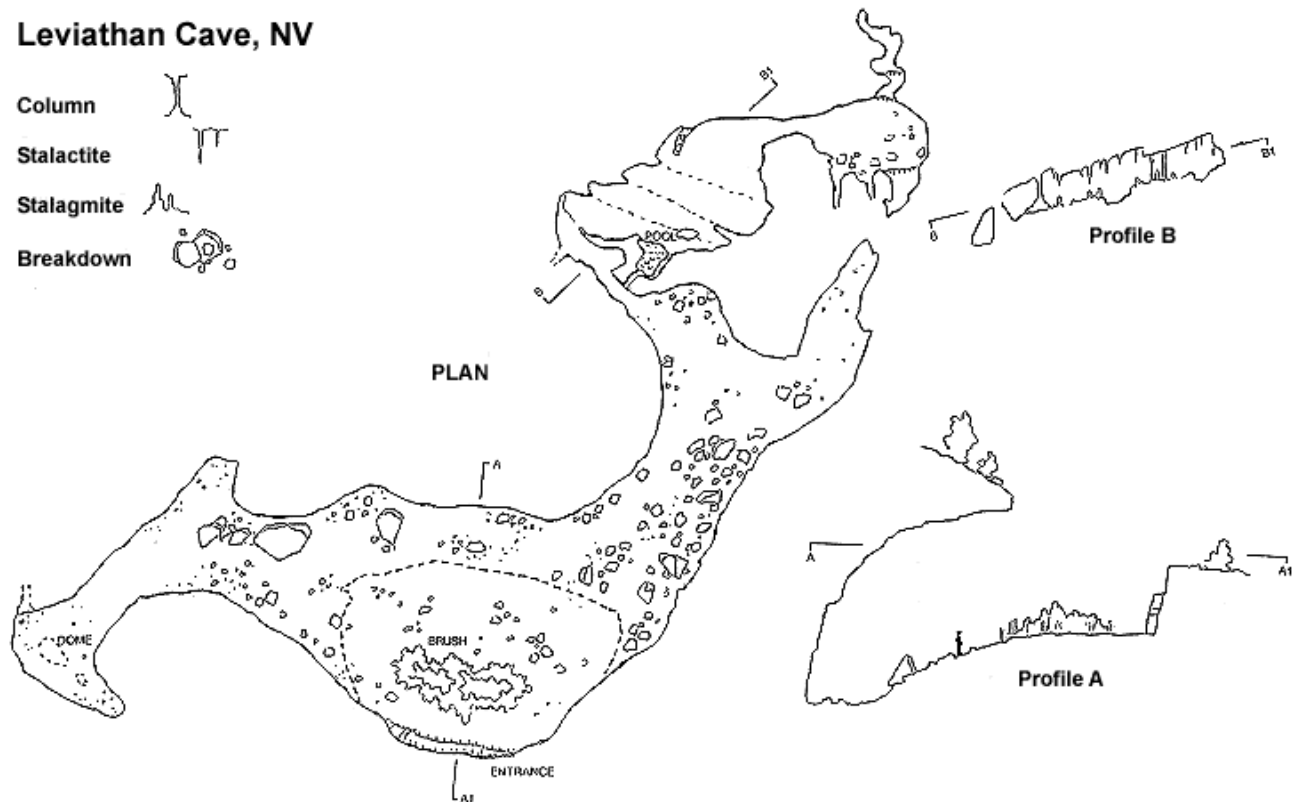
Entrances and terminations



Karst Processes

Limestone Caves

Passages, Rooms, and Patterns



6/3/93

Karst Processes

Origins of Limestone Caves

caves form:

- above the water table by corrosive action of vadose water,
- beneath the water table by circulation of phreatic water, or
- at the water table or in the shallow phreatic zone, often associated with fluctuations of the water table itself.

