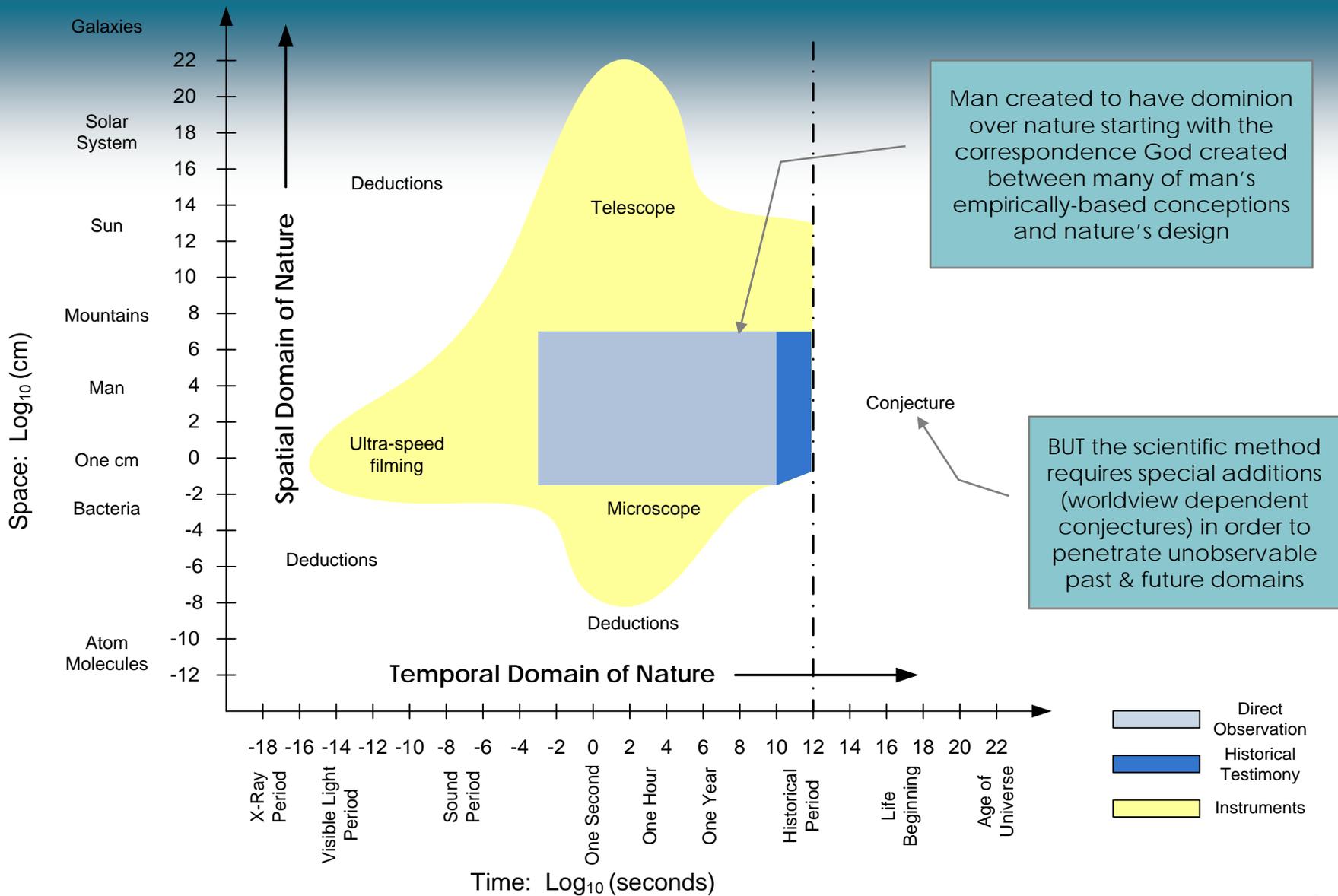


# Limits of Empirical Knowledge



# From Uniformity to Uniformitarianism

**Uniformity of natural law = constancy of natural processes actually observed**

**Uniformitarianism = the belief that**

- (1) only natural processes observed today can be used to account for observed geological, chemical, and atomic structures;**
- (2) the rate of such natural processes observed today has always remained about the same**

# What methods can science use to study history?

**“Evolutionary biology, in contrast with physics and chemistry, is a historical science: . . . *Laws and experiments are inappropriate. . .* Instead one constructs a historical narrative, consisting of a tentative reconstruction of the particular scenario that led to the events one is trying to explain.”** [Emphasis supplied]

*Scientific American* Vol 283 (2000) 80



Ernest Mayr (1904-2005)

# Harvard Theologian Paul Tillich

**“There are no revealed doctrines, but there are revelatory events and situations which can be described in doctrinal terms.... The ‘Word of God’ contains neither revealed commandments nor revealed doctrines.”**

Paul Tillich, *Systematic Theology*, I (Chicago: University of Chicago Press, 1951) 125

# Lyell's Uniformitarianism & Charles Darwin

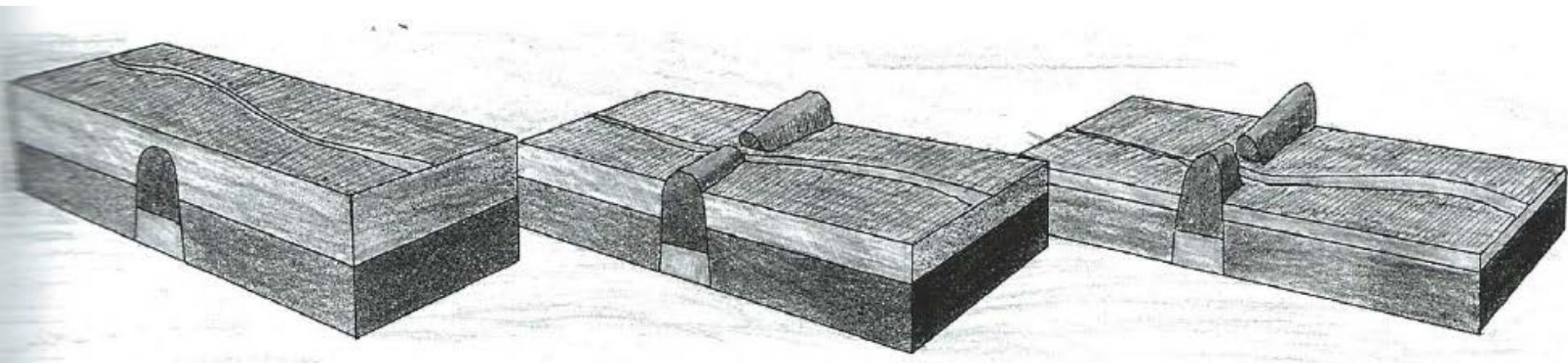
“The physical part of Geological inquiry ought to be conducted as if the Scriptures were not in existence. . . . [To a fellow uniformitarian geologist, Lyell wrote he wanted to] “free the science [of geology] from Moses.”

Darwin wrote: “He who can read Sir Charles Lyell’s grand work on the *Principles of Geology*, which the future historian will recognize as having produced a revolution in natural science, yet does not admit how incomprehensibly vast have been the past periods of time, may at once close this volume.”

Terry Mortenson, *Naturalism* (Answers in Genesis blog on World Religions, 2017) Chapter 12

# Water Gaps (Historical Geology)

The “deep time” explanation tries to explain why the river appeared to have cut through an elevated ridgeline by staying unchanged while the surrounding land somehow slowly eroded without filling in the river.



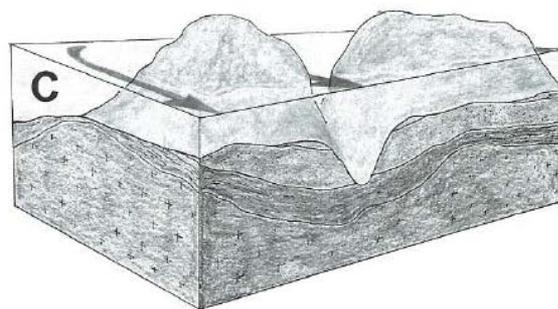
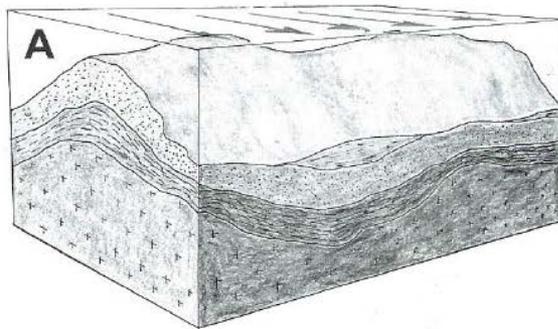
**Original situation:  
no ridgeline**

**Surrounding surface slowly eroding**

**Present state with hard ridgeline left**

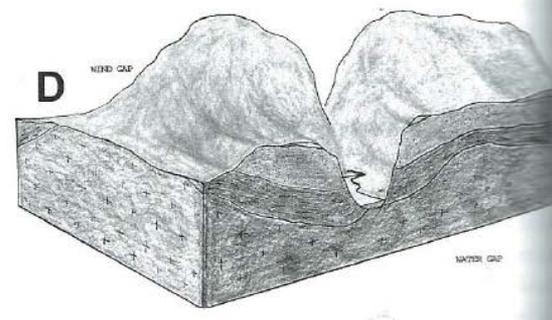
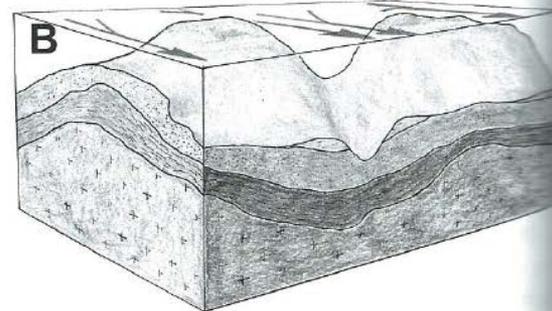
# Water Gaps (Flood Geology)

**During Flood water flows perpendicular to a hard ridge**



**As Flood recedes erosion continues only in lower areas**

**During Flood softer areas worn down**



**Today just the lowest gap has a river in it**

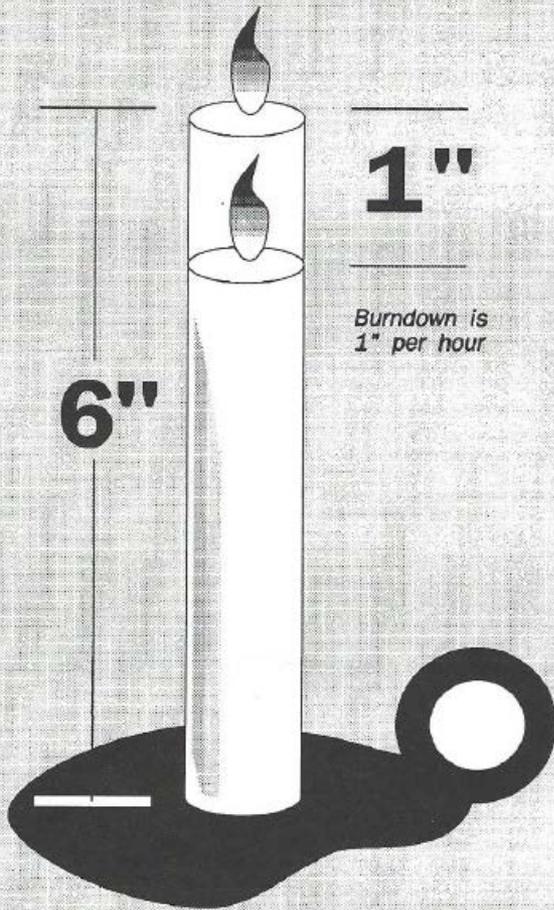
# Polystrata Tree Trunk in Sedimentary Layers



# A Candle "Clock"

## THE BURNING CANDLE

When was the candle lit?



Starting length (in)	Burn rate (in/hr)	Burn duration (hr)	Measured length now (in)
$L_e$	$[L/t]$	$T$	$L_m$

$$L_e - [L/t] * T = L_m$$

Solving for burn duration. . .

$$\frac{[L_e - L_m]}{[L/t]} = T$$