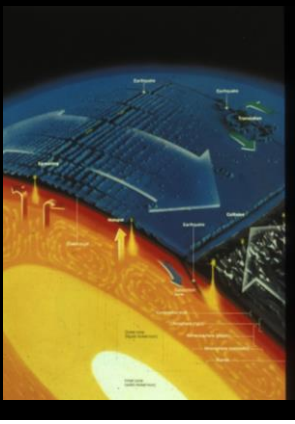
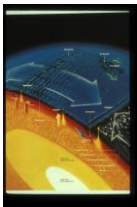
Decay of radioactive isotopes in Earth's core generates heat.

The flow of this heat is the driving force behind Plate Tectonics.

Tectonic activity has produced 3 major rock types that comprise Earth's crust:
- Igneous (including volcanic)
- Sedimentary
- Metamorphic

Tectonic activity is also responsible for fossilization.

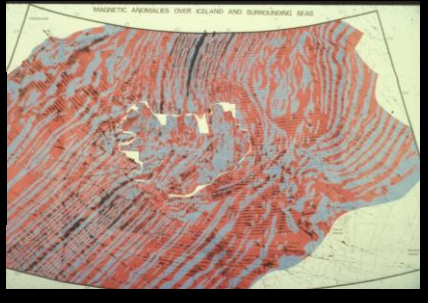




•Seafloor Spreading

•Magnetic reversals may be recorded as paleomagnetism, which gives us one kind of geological clock.

Igneous rocks solidify from a molten state – at temperatures too high to preserve life forms.



Volcanic activity rarely promotes fossilization (but the exceptions to this rule can be spectacular).

Volcanic rocks are easy to date, radiometrically, and are very important in establishing the chronology of the fossil record.

Volcanic terranes like this are poor places to look for fossils.

Metamorphic Rocks are transformed from pre-existing rocks, via heat and pressure.

They might have once contained fossils, but the process of metamorphism usually destroys all evidence of life.

Sedimentary rocks are the major sources of fossils.

Gravity and water combine as the two major agents of erosion to produce sediments

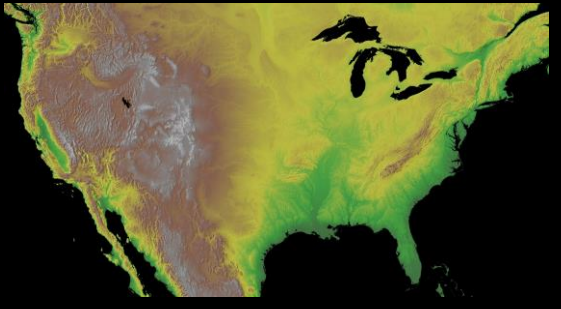
Sedimentary rocks are layered, and mostly laid down as beds, which can contain fossils.

Tectonic activity returns deeply buried fossils to the surface, where they can be found with an eyeball-ometer and a pair of feet.

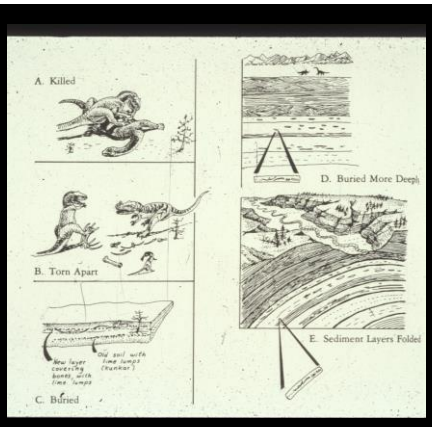
Folded sedimentary beds (California)

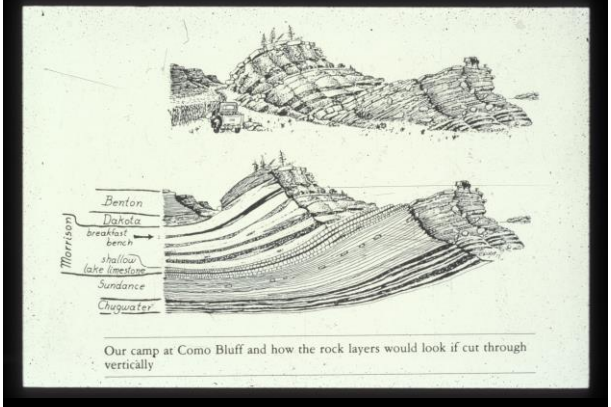
In mountainous regions and high desert plateaus, tectonic activity has returned fossils to the surface.

Erosion also cuts into the crust and exposes ancient rocks and their fossils.



Vegetation obscures fossils.



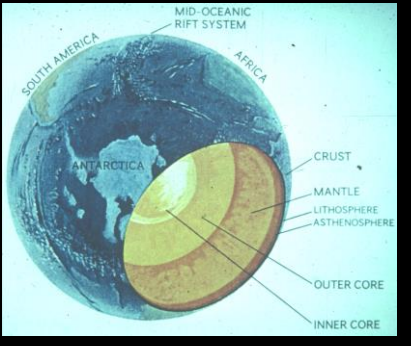


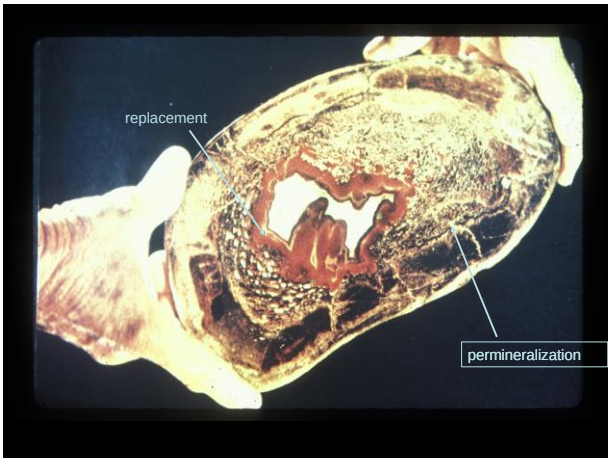
Our camp at Como Bluff and how the rock layers would look if cut through vertically

There is a natural connection between:

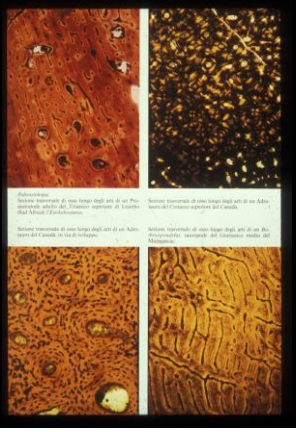
radioactive decay
heat production
tectonic activity
burial of fossils
fossilization
uplift

discovery





Microscopic detail can be preserved, possibly even ancient molecules.

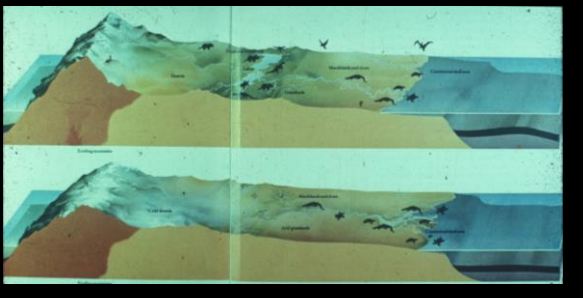


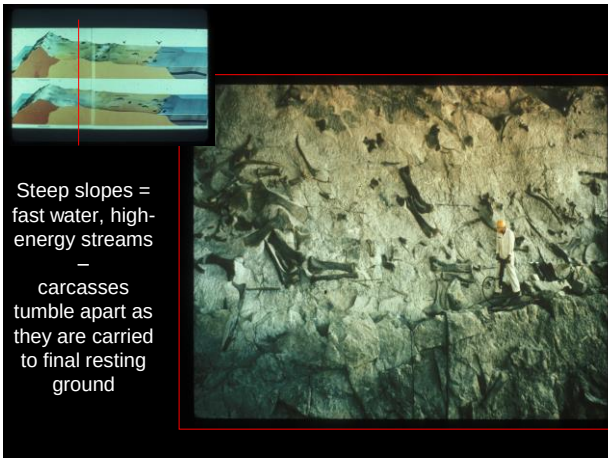
Fossil record is highly incomplete, which makes testing both extinction hypotheses challenging….

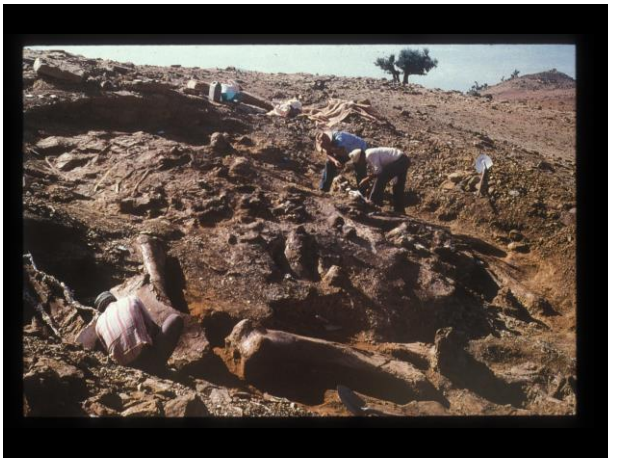
Deserts, for example, abound in Life….

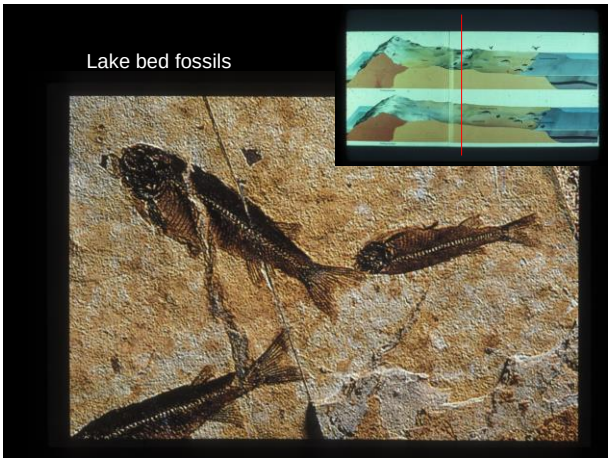
and potential fossils…

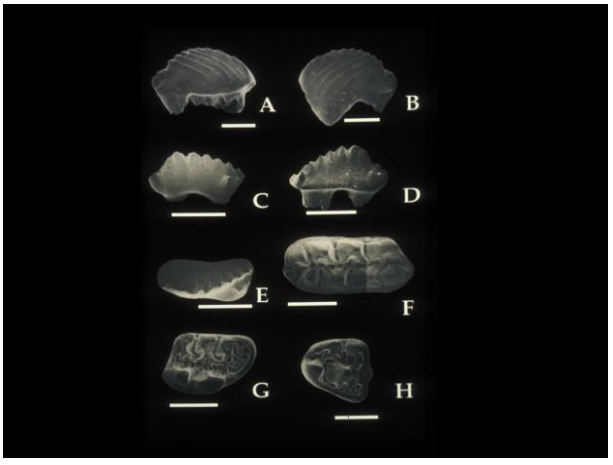
Water for Life, water for erosion, water to carry sediments for burial….sometimes blowing sand, sometimes ash....




Steep slopes = fast water, high-energy streams
–
carcasses tumble apart as they are carried to final resting ground

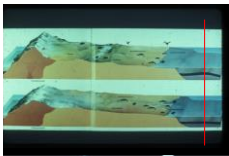


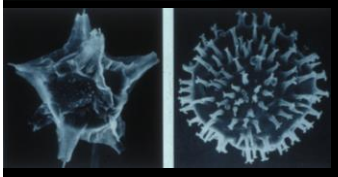

Lake bed fossils



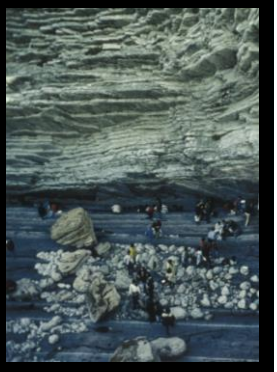
The shorelines of Cretaceous Texas preserve thousands of dinosaur tracks, but few bones.

Wave zones will break bones and shells….

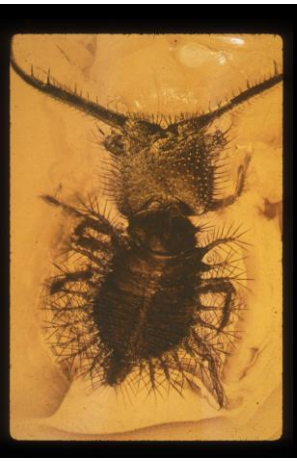




Microfossils in marine sediments



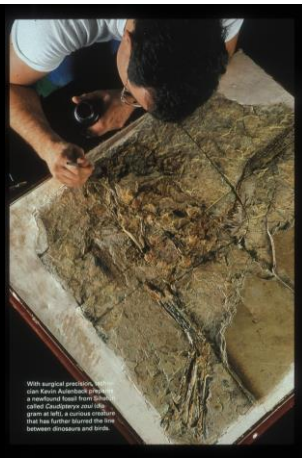
Amber

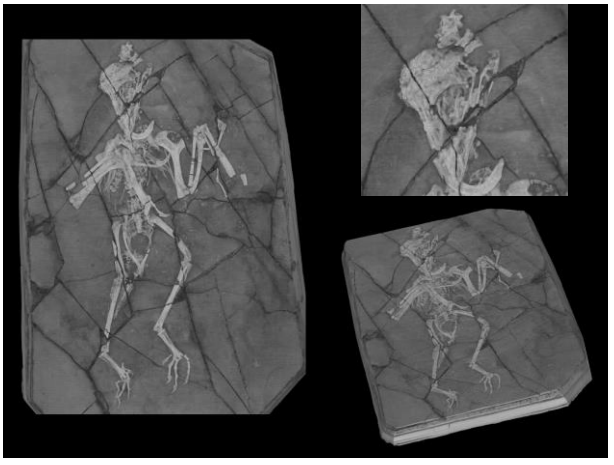


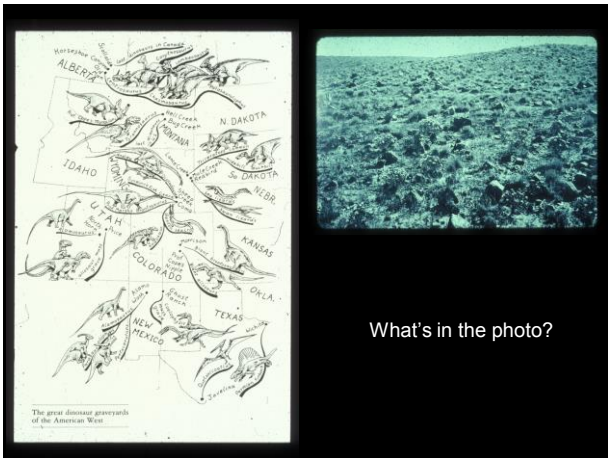
Blowing sand occasionally works….

Ash clouds sometimes work too…

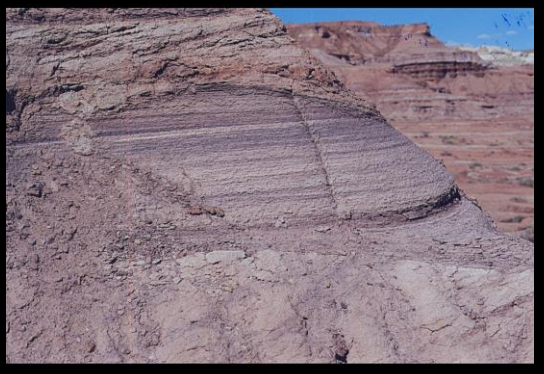
Liaoning, China







What's in the photo?



Late Cretaceous rocks of western North America are an important source of fossil evidence of the great extinction, owing to the tectonic history of the plate.