Dating Techniques

“So….you come here often?”

**Relative Dating Techniques**

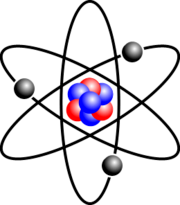
* **Lithostratigraphy:** study of strata or rock layers
  + Known rock layers
    - Where certain things are found
* **Tephrostratigraphy:** Via chemical traces of volcanic ash
* Chemical techniques within sites
  + Fluorine in skull did not match mandible or associated fauna
    - The “oldest” human skull ananology

**Calibrated Relative Dating Technique**

* **Geomagnetic Polarity**
  + Normal vs. Reverse polarity
    - When rocks are formed, the iron particles in the rock will flip according to the pull of the magnetic field of the Earth
  + The geomagnetic polarity time scale (GPTS)
  + **Paleomagnetism**
    - Study of magnetism of Earth’s past

Chronometric Dating Techniques

* **Radiometric dating**: radioactive decay
* Half-lives



***Homo naledi***

* Different results from various testing mechanisms
  + Radiocarbon dating. Around 50, 000 years
* Will try to extract DNA, will require destruction
* Accepted age: at least 236,000 years old

**The Earth in the Cenozoic**

* **“Age of the Mammals”**
* Continents and land masses
  + 225 MYA (Mesozoic) **Pangea:** Contiguous land mass
  + 200 to 135 MYA (Mesozoic)
    - The Earth was divided into two major land masses
    - **Laurasia: Present-day North America, Europe, and Asia**
    - **Gondwanaland:** Africa, South America, Antarctica, and Australia/India
  + 65 MYA: Dinosaurs extinct, continents mostly separated

**Overview of Climatic Changes During the Cenozoic**

* The climate has become colder and more variable over the last 20 million years
* More primates start to evolve
* Early primates were wiped out from the *Grande Coupure*

**The Earth and Environment in the Cenozoic**

* Oxygen isotopes O^18 and O^16
  + Temperature, sea level
* Paleosols and Loess
* Vegetation
* Stable Carbon Isotope ratios in teeth and soil
* Animal communities

**Gaps in the Fossil Record are inevitable**

* Most things that were alive do not get fossilized
  + Super rare occurrence
  + Problem of discovery
  + 3% of fossil species are ever found