

Final Exam Review

1820's → Uniformitarianism

- “all geologic phenomena are the result of existing forces having operated uniformly from the origin of the earth to the present”

Dating → for constructing evolutionary sequences and correlating events across continents and across the globe

- Absolute Dating - specific age in years before present
 - Carbon Dating
 - 200,000 - 50,000 years,
 - carbon14 (radioactive isotope decays into non-radioactive isotopes C12 and C13)
 - Proportion of C12 to C14 increases with time
 - Potassium Argon Dating
 - used on volcanic tuff in East Africa
 - K40 → Ar40 (or Ar → Ar39)
 - Uranium Series
 - used on tufa, speleothems, apatite
 - U238 or U235 → daughter isotopes
 - problem with diagenesis (mineral replacement)
 - Paleomagnetism
 - shifts in Earth's magnetic poles
 - used in loess deposits (China) and cave deposits
 - Electron Spin Resonance
 - detects presence of unstable electrons trapped in solids
 - useful for sites around 100,000 - 200,000 yrs
 - large margin of error at older sites
- Relative Dating
 - Superposition
 - what is on top is more recent and what is on the bottom is older
 - must watch out for shifting in rocks
 - Faunal Dating
 - uses guide fossils or faunal seriations
 - FADs (first appearance date) vs LADs (last appearance date) → appearances might be off
 - uses all species from fossil site to form time periods

Bipedality, Earliest Hominins

Earliest Hominins: what, when, where?

- what:
 - wrist morphology suggests knuckle-walking retention
 - swinging gate walking style
 - reorientation of spine, limbs, and head
- bipedalism by foramen magnum forward position —> no single selective advantage
 - order hypotheses: carry things, communication, secondary sexual characteristics, appear larger, efficiency, frees hands for tools, head better supported
 - savannah hypothesis: stand up to see over grasslands —> false, grasses were low and savannah didn't spread until long after bipeds
 - efficient but slow locomotion
 - free hands to carry and throw
 - predator protection
 - thermoregulation —> less heat from sun, allows brain expansion
 - running backwards
 - threat displays
 - long distance running sexual selection and male provisioning
 - niche expansion
 - slinky hypotheses: brain folds over and neocortex becomes large
- when:
 - molecular clock suggests chimp and human ancestors diverged 5 - 7 mya
- where:
 - Africa, closest ancestors formerly inhabited

Factor

Carrying (objects, too weapons, infants)



Hunting

