PROPERTY OF:

EARTH SCIENCE – UNIT 5 – CHAPTER 13 NOTES

CLUES TO EARTH'S PAST

13.1 Fossils

- Fossil = evidence of once-living organisms preserved in rock
- 3 categories of fossils: remains, imprints, or traces
- fossilization usually needs these 3 requirements to happen:
    - a quick "burial" (being covered by sediments to prevent decomposition)
    - no decomposition (if it is broken down by decomposers, there will be nothing left!)
    - the organism contains hard parts (bones, teeth, shells)

13.1 Six Types of Fossils

1. Petrified Remains =
   plant or animal remains that have been turned into rock
   occurs when hard minerals in the groundwater replace softer tissues
   EX: petrified wood often contains quartz
   (Petrified Remains can also be referred to as Permineralized Remains)
2. Carbonaceous Film =
   a fossil imprint in a rock that shows an outline of the original specimen
   formed when heat and pressure (during burial) create an outline from the carbon atoms in the organism
   (Carbonaceous Films can also be referred to as Carbon Films)
3. Mold =
   an empty cavity in a rock that has the shape of a fossil that used to be there
   occurs when the fossil is buried under sediments and is weathered away by water, air, acids, etc.
4. Cast =
   a type of fossil in which a mold is filled with hardened minerals or sediments
   occurs when sediments or hard minerals from the groundwater fill in a mold
5. Original Remains =
   fully preserved organisms or parts of organisms
   occurs when the organism cannot decay because decomposers were not able to live there
   EX: grasshopper preserved in sticky resin
   EX: woolly mammoths preserved in frozen tundra
   EX: cave-man preserved in a glacier
6. Trace Fossils =
   traces of animal activities preserved in rock
   EX: footprints, worm holes, burrows

13.1 Index Fossils

- fossils that scientists use to determine the relative age of a rock sample
- index fossils must meet 3 criteria:
    1. species could only exist for a short period of time
    2. species were abundant (there were a lot of them)
    3. species can be found throughout the world
- NOTE: Index fossils are NOT a 7th type of fossil! They can be any one of the 6 categories!

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13.2 Determining the Age of Rocks

1. The Principle of Superposition = in an undisturbed layer of rocks, the oldest are at the bottom and the youngest are at the top
2. Relative Dating = determining the order of events and the relative age of rocks ("older" or "younger") by examining the positions of rocks in layers
   THIS DOES NOT TELL YOU THE EXACT AGE!!!
3. Absolute Dating = a method of determining the exact age of rocks
   EX: carbon dating
4. Rock Correlations = comparing 2 rock samples based upon their rock layers to see if there are any similarities
5. Unconformities = gaps in the rock layers due to erosions (in other words, part of a layer was eroded, so it becomes more difficult to do relative dating)
   - 2 types of unconformities: angular unconformity and disconformity
   EX. 1: Angular Unconformity
      (1) horizontal layers of rock are tilted and uplifted
      (2) the tops of the tilted layers are eroded
      (3) younger sediments are deposited on top
   EX. 2: Disconformity
      (1) horizontal layers of rock are eroded
      (2) younger sediments are deposited on top, which buries the eroded surface

13.2 Diagrams

1. Original Sequence (Principal of Superposition)
2. Disconformity – Part 1 (Erosion)
3. Disconformity – Part 2 (New Layers)
4. Fault – Before
5. Fault – After
6. Fault, then Erosion
7. Erosion, then Fault
8. Uplifting or Folding – Before
9. Uplifting or Folding – After
10. Angular Unconformity
11. Igneous Intrusion or Igneous Dike