Ancient Sedimentary Environments

GEOL 1602 Lab 3

Environments of Deposition

- Terrestrial (non-marine)
  - Alluvial fans
  - River floodplains
  - Lakes
  - Glaciers
  - Eolian (windswept)
- Transitional
  - Delta
  - Beach
  - Lagoon
- Marine
  - Shallow marine
  - Deep marine

Alluvial Fans

- Clastic sediment deposited onto plains from mountains

River Floodplains

- Lowlands composed of river deposits.
- Overflows during flood stages.

Glaciers

- Volumes of rock debris including boulders
- Poorly sorted

Lacustrine (Lake)

- Includes playa lakes (pictures)
  - Created from runoff from heavy storms.
- Results in mudcracks:
  - Evaporation causes change from wet to dry conditions in mud

- **<u>Mudcracks are created from periods of wetting and drying</u>**

Deep Marine

- Sediment becomes carried down continental slope.
  - Submarine fans are similar to alluvial fans

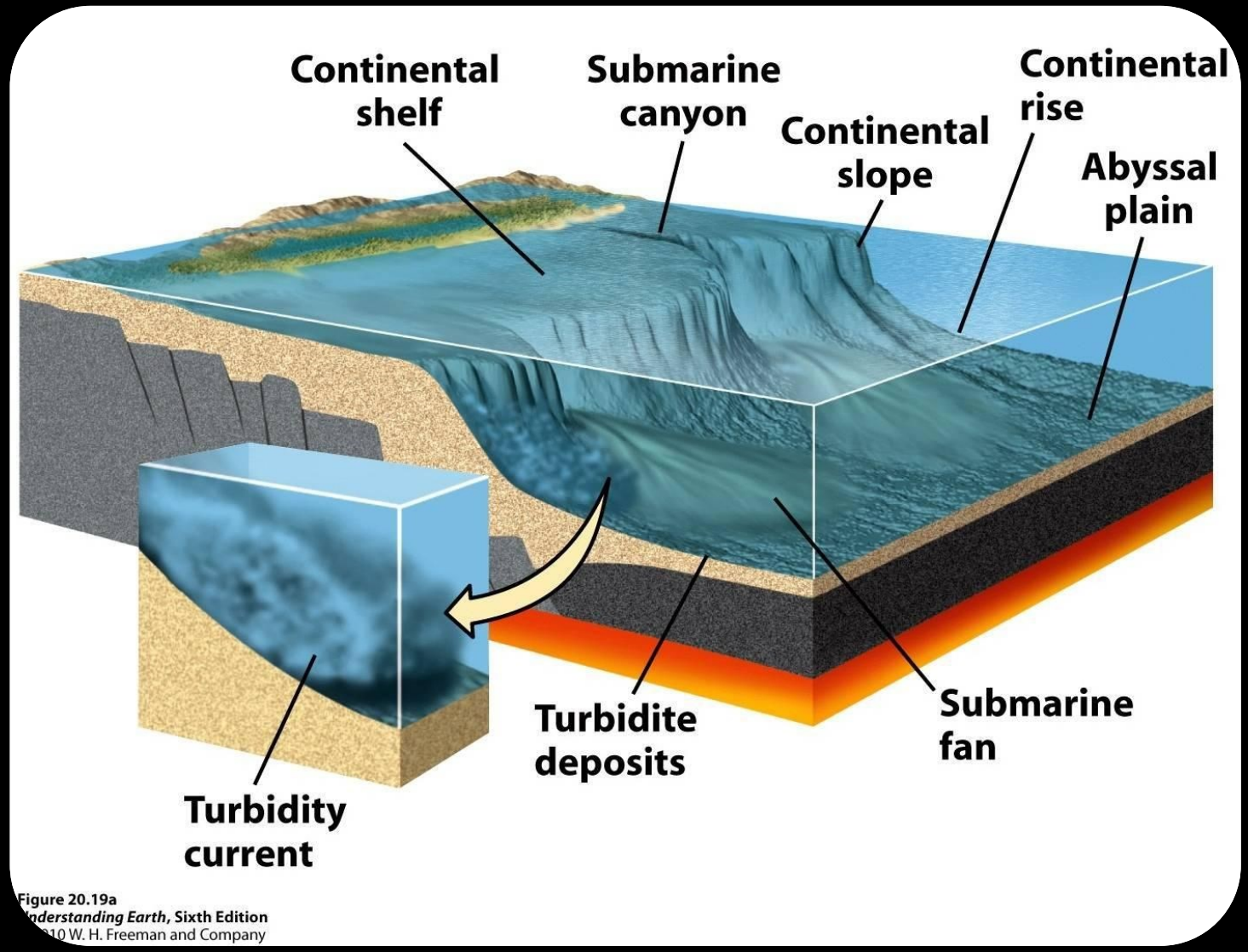

Figure 20.19a
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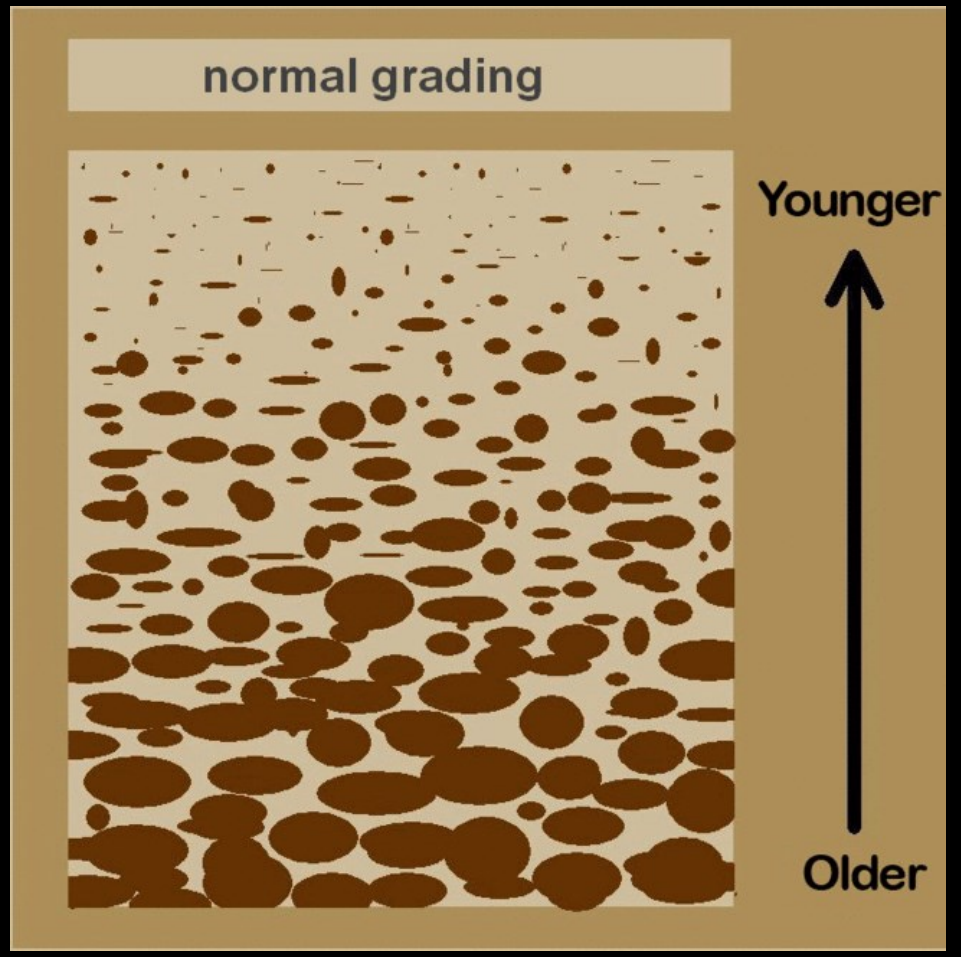
Graded Bedding

- Coarser sediment at the bottom
- Finer sediment towards the top
- Usually a product of **turbidity currents**



Plane Bedding

- Can be formed in any sedimentary environment
- Laterally extensive
- Usually thinly laminated
- **Disrupted by bioturbation**
  - Burrowing organisms
- To be preserved,
  - **No burrowing organisms (no bioturbation)**
  - **Anoxic environment**
  - **glacier-associated lakes which tend to deposit sediment quickly and lack organic sediment**

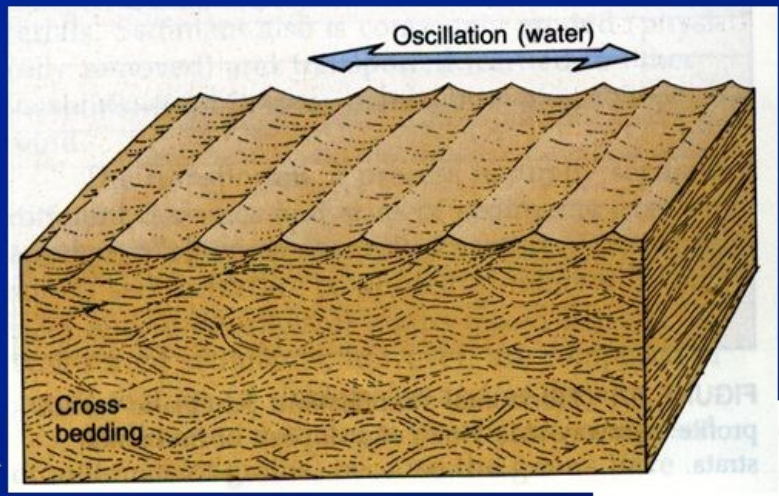
Cross Bedding

- Indicate sediment deposited in current
- Truncated beds = original side up
- **<u>Cross beds slope in direction of flow!</u>**

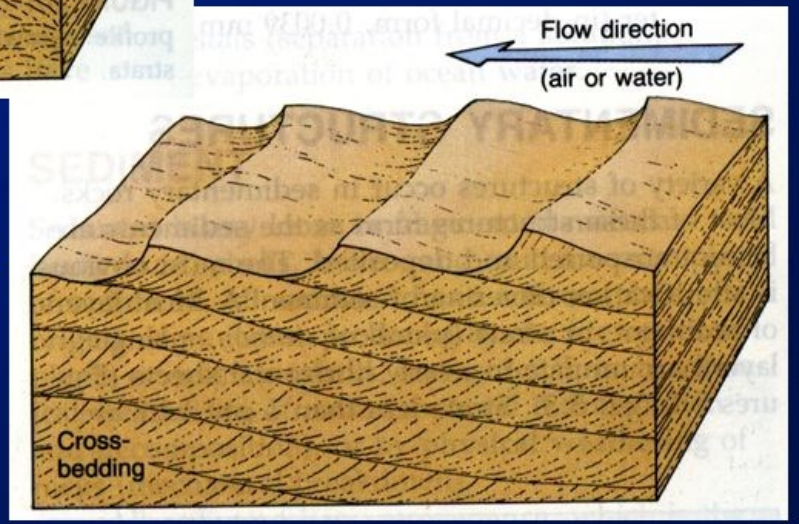
Ripple Marks

- Can be symmetric or asymmetric

Ripple marks



- Symmetric ripples indicate bi-modal current
- Concave = up



- Asymmetric ripples indicate unidirectional current

Tool Marks

- Marks created by grains dragging along a surface
- Useful for interpreting paleocurrent