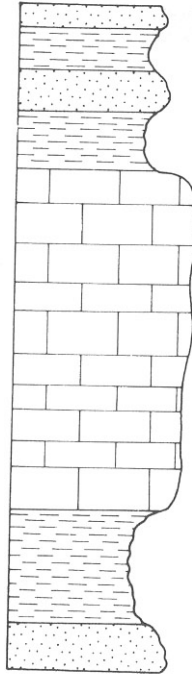


Middle Devonian (Givetian)

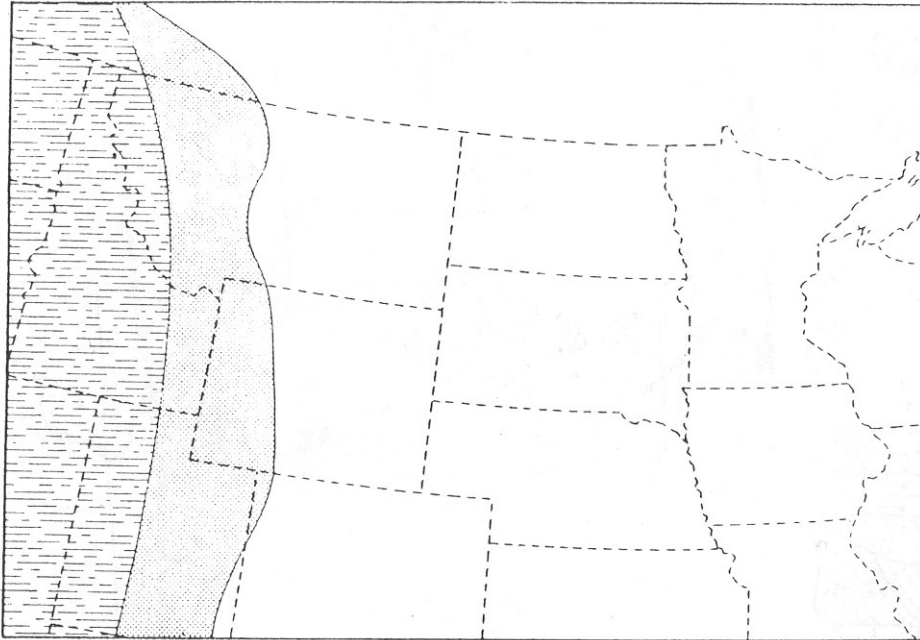
4. (8pts) Examine the following stratigraphic column. Rock types are indicated to the left of the column.
- Label whether each unit represents a transgression (T) or regression (R).
 - What is the nature of the contact between units A and B?



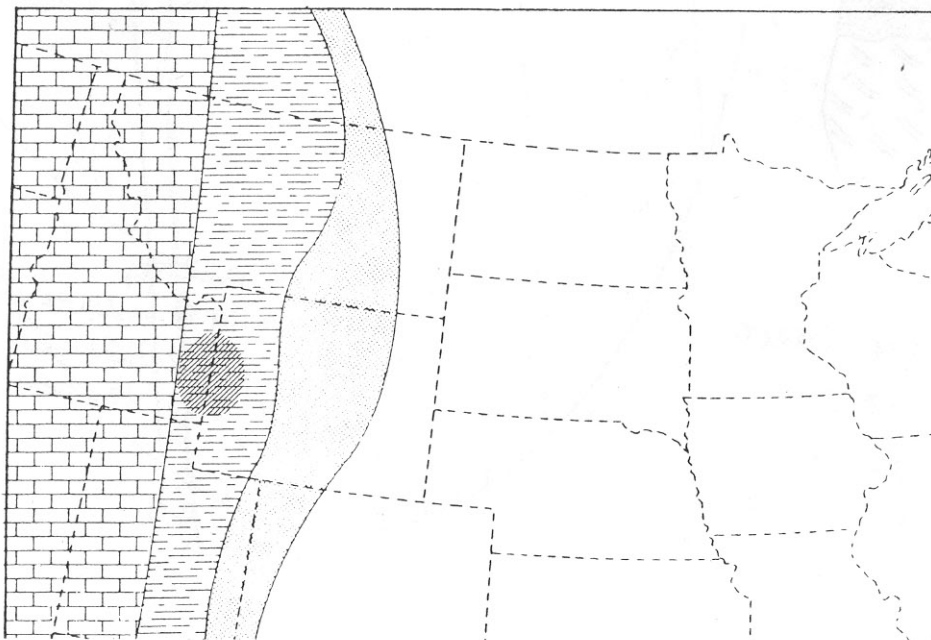
5. (2pts) Geologists refer to Hudson Bay, Canada, as an example of a modern epeiric sea. What is an epeiric sea?

5. Shown on the following page are two lithofacies maps. Map one is older than map two.
- on Map one, label where you believe that land would be found, and use an arrow to indicate the direction towards the basin (2pts)
 - Does Map two indicate sea level has risen or fallen in the interval of time between maps one and two? (2pts)
 - What two lines of evidence do you see that support your answer to question 5b? (4pts)

FACIES MAP ONE



FACIES MAP TWO



6. (9 pts) What are the three components of Milankovitch cycles and on what frequency does each vary?
7. (10pts) If measurements of the O_{18}/O_{16} ratio in a marine fossil shell show a decrease in value (O_{18}/O_{16} decreases), would this be characteristic of an interglacial warm period in Earth history, or a cool down? Explain your answer.
8. a. (4pts) Explain why Apparent Polar Wandering curves demonstrated that the plates moved over time.

- b. (2pts) What relationship of the Earth's magnetic field to the Earth's surface enables geologists to determine the latitudinal position of various plates in the geologic past?
9. a. (10 pts) Demonstrate that you understand how extensional, collisional and transform plate boundaries differ by listing at least one characteristic of each, in terms of their seismicity, volcanism, and topography.
b. (2pts) of all the characteristics you just listed, which is/are the one(s) most likely to be preserved in the geologic record (*i.e.* will be the best record of that type of ancient plate boundary)?

10. (4pts) Complete the following sentence: "Determining the grain size of a sedimentary rock enables us to draw conclusions about _____

_____.

Because this varies inversely with _____, grain size can be used as a proxy for bathymetry of the depositional environment."

11. (7pts) To demonstrate that you understand what these terms mean, provide a modern example of each of the following; you may not use the same organism twice.

- a. vascular plant
- b. echinoderm
- c. cnidarian
- d. angiosperm
- e. pelecypod
- f. non-vascular plant
- g. gastropod
- h. arthropod

12. (12 pts) List the geologic periods of the Phanerozoic, from oldest to youngest, and their ages.

13. Paleogeography is determined by examining the distribution of various rock types. What can you infer about the presence of mountains, shallow seas, shorelines, lagoons or bays, lake vs ocean, etc. from the following rock types:

- a. mica- rich sandstone
- b. limestone

- c. granite
- d. mudcracked shale
- e. well sorted, quartz-rich sandstone
- f. conglomerates
- g. vesicular basalt
- h. symmetrical rippled sandstone