

GL3442 Sedimentation and Stratigraphy
Laboratory Exercise 4 (25 pts.)
Sedimentary Structures

PURPOSE: To acquaint you with some of the more common sedimentary structures, and their applications as environmental indicators.

PROCEDURE: The following questions correspond, by number, to the provided samples. Study each sample. Then answer the corresponding questions. You will be graded on completeness, so make your answers as complete as is appropriate. If a depositional history is requested, make sure that your interpretation addresses all structures and lithologic features present in the samples. If the concretion you are asked to identify is a special kind of concretion, specify it as such. The following references may be of use to you, and are in Rhodes Hall rm 114.

Blatt, H., Middleton, G., and Murray, R., 1980, Origin of Sedimentary Rocks: Prentice-Hall, Inc., Englewood Cliffs, New Jersey, 782 p.

Fritz, W.J., and Moore, J.N., 1988, Basics of Physical Stratigraphy and Sedimentology: John Wiley and Sons, Inc., New York, New York, 371 p.

Friedman, G.M., Sanders, J.E., and Kopaska-Merkel, D.C., 1992, Principles of Sedimentary Deposits: Macmillan Publishing Company, New York, New York, 717 p.

Moore, R.C., and Teichert, C., 1975, Treatise on Invertebrate Paleontology (Supplement W; Trace fossils): Geological Society of America, Boulder, Colorado, 269 p.

Questions Corresponding to the Provided Samples

1) Under what flow-regime conditions were the sediments in this rock deposited? How can you tell?

2) Identify the encircled features. Support your interpretation.

3) Identify the bedding-plane structures on side 'A' of this sample. Describe the current direction(s) at the time these structures were formed. Give specific directions (e.g. NE, SW, etc.). Support your interpretation. Which side is the top of the bed, side 'A' or side 'B'? Support your answer.

4) Identify this structure. How was this structure formed? In what environment was this rock most likely formed?

5) Offer an interpretation for the deposition of this rock. Be complete, including in your interpretation all lithologic and structural features.

6) Classify the laminated structure which dominates this sample.

7) Identify the structures indicated by the black arrows. What do these structures tell you about the diagenetic history of this rock?

8) Offer an interpretation for the depositional history of this rock. Be complete.

9) How did the organism(s) which generated these trace fossils make a living?

10) Identify the structure labeled 'A'. Identify the structures labeled 'B'. What can be said about current direction(s) (NE, SW, etc.) based on these structures? Which side is up, side 'X' or side 'Y'? How can you tell?

11) Identify the predominate laminated structures in the sample.

12) Identify the structures dominating the top surface of this bed. What do these structures tell you about the history of this deposit?

13) Identify the encircled trace fossil to the level of genus. What does presence of this trace fossil tell you about the depositional conditions which produced this rock?

14) Identify the laminated structures indicated by the black arrow. Which side is the bed top, side 'A' or side 'B'?

15) Identify the trace fossil indicated by the two black arrows to the level of genus. How did the organism which generated this trace fossil make a living? How can you tell?

16) Identify the red-colored structures. How well do these structures follow primary lamination?

17) What mode of fossil preservation is represented by this sample?

18) Identify the structures indicated by the black arrows. What were the energy conditions in the environment which produced this sample?

19) Identify this structure. How was this structure formed?

20) What structure is represented by the area enclosed in rectangle 'A'? What can be said about the energy conditions under which this sample was deposited?

21) Identify the predominate structure in this sample. What can be interpreted regarding the flow regime of the environment which produced this sample?

22) Identify the secondary structure represented by this sample. What can be determined about the depositional environment of this sample?

23) Identify the encircled structures. What is the probable depositional environment for this sample?

24) Offer an interpretation for the size distribution of fossils in this sample.

25) Identify this structure. Offer a brief history for the formation of this structure.

26) Identify the indicated trace fossil. Which ichnofacies does this rock represent.

27) Identify the structures indicated on side A of this sample. Is side A the top or bottom of the bed.

28) What type of feeding activity is represented by the indicated traces?

29) Offer and interpretation for the strange texture of the bed surface on side A.
Be complete.

Bonus

30) Any ideas on what these strange trace fossils represent?