

Pennsylvanian
Field
Trip

16th February, 2008

- We will leave promptly at 8am
- Bring any snacks or drinks you want
- We will eat lunch at a diner in Jacksboro (great BBQ and other food)
- Depending on conditions we will be home between 3 and 4
- Forecast is now (Tuesday am) for a high in the low 40's, starting out about 28°! Dress warmly.

On this trip you will make a collection of fossils at several stops in Pennsylvanian-aged rocks and produce a report on the collection that is due at the end of the semester.

This report will include information about the fossils you found, the type of rock they were in and your 'reconstructions' of the environments that are represented.

Bring: Notebook, pencils, water, snacks, hand lens, appropriate gear for the weather, camera (if you want to take pictures rather than sketch the outcrop) and bags to store specimens.

Field Objectives

1. Make a representative collection of Pennsylvanian fossils from several different areas in north-central Texas. At each stop fossils should be collected and care should be taken not to mix fossils from different localities. At each stop you should:
 - A. Make a sketch (or take a photograph) and a brief written description of the lithology at each stop. If you have not described sections before I will help you. Your sketch should show any different lithologic units and should include fossiliferous horizons if such can be detected.
 - B. You should collect one representative member of each different species at each outcrop. There will be a certain temptation to collect duplicates of a species, especially if they are present in large numbers, but there is really no need to collect more than one of each species from each outcrop (*if you have any doubts about a specimen being a new species then collect the specimen and worry about tossing it later if you were wrong*). You should bring along some kind of collecting bags for specimens. I suggest plastic zip-lock bags with some kind of water-proof marker.
 - C. Once you have accomplished **A** and **B** above, you need to make a census of the fauna. Given the expected temps, rather than taking a census in the field, you may find it easier to collect everything you can in a sample area, put it in a bag, then bring it back and take the census in the lab. We will use the data obtained from the census to calculate a Simpson's Index of Comparison between each outcrop.

Lab Objectives

2. Identify all the fossils collected at each stop. In lab there are aids to assist you in identifying the fossils you collected. These are in the form of reference collections and xeroxed photographs.

As each fossil is identified you should give it some mark to key it into your list of fossils. One way of doing this is to enclose them in small plastic bags that have been marked or to mark the fossil with a waterproof marker. These fossils will eventually be turned over to Dr. B who will compare the fossils with their identifications. A handy way of presenting the fossils is to paste them to pasteboard or to enclose them (in their bags) in a box with the sheet that identifies particular fossils according to the taxonomic scheme described below.

Stats to calculate for fieldtrip data

- Simpson's Index of Comparison
- Total by 'Group'
- Percentage of fauna

Simpson's Index

$$D = \frac{C}{N_s}$$

D = Simpson's Index

C = Number of common taxa

N_s = Number of taxa in smaller fauna

$$D = \frac{C}{N_s}$$

So, suppose I have two faunas. In the first I collected 6 genera and I collected 20 in the second. There are three genera in common between the two. Then:

$$D = \frac{3}{6} = \frac{1}{2} = 0.5$$

Total by Group

For each stop plot the total number of
genera in each group

Percentage of fauna

For each stop plot the percentage of each
group found

Porifera

Fusulinidae

Bryozoa

Brachiopoda

Gastropoda

Cephalopoda

Cnidaria

Crinoidea

Echinoidea

Report Format

3. Write a report detailing the results of your study. It should be in the following format:

A. Introduction

This section should include information on the day and conditions of the trip, the purpose of the trip, geographic locality information and background geological information (this you may obtain this from library sources).

B. Data

This section should include a tabular list of identified taxa and outcrop description for each outcrop. The phyla should be in the same rank order as they appear in your course syllabus for labs. If you identify an organism from a phylum not covered in lab consult Dr. B as to its correct place. The following example should be followed for correct listing of identified species; please keep in mind that what follows is an example and does not necessarily reflect any organisms found on this particular trip:

```
Phylum Mollusca
  Class Bivalvia
    Order Halvingi
      Family Hobbiti
        Genus Bagenensis
          species bilbo
            frodo
          Genus Kilroyensis
            species washereei
    Order Butleri
      Family Fahrvernugeni
        Genus Pitleroceras
          species dumbei
```

At this point you should get the general idea about the organization of the key to the identified taxa; if not ask me for additional examples. Ask me about what to do with unidentifiable taxa.

C. Results

This section should include an outcrop by outcrop description of the geology, sketches or photographs of the outcrops and a brief discussion of the few most abundant taxa at each outcrop. It should also include the Simpson's index table (matrix) comparing each stop.

D. Conclusion

This section should include your conclusions about the environments of each outcrop and your conclusions about the similarities between the outcrops based on the similarity indices you calculated in part C. You should feel free to use any references here you can to help support your conclusions.

E. References Cited

This should contain an alphabetical listing of each of the references you cited in the body of the paper. These will usually be sources used for identifying fossils and references to the geology of the area.

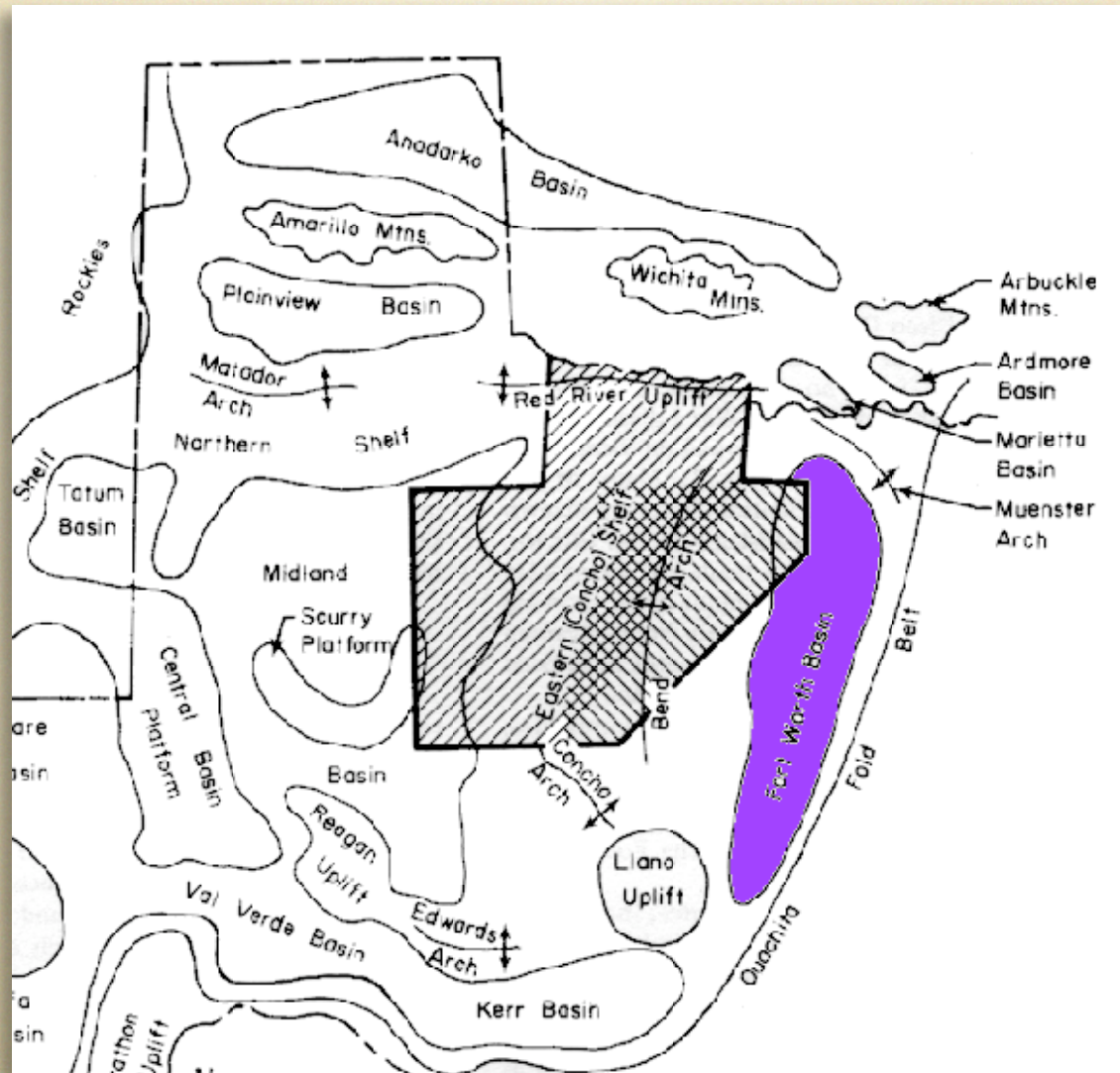
Important Deadlines

1st Draft - March 24th

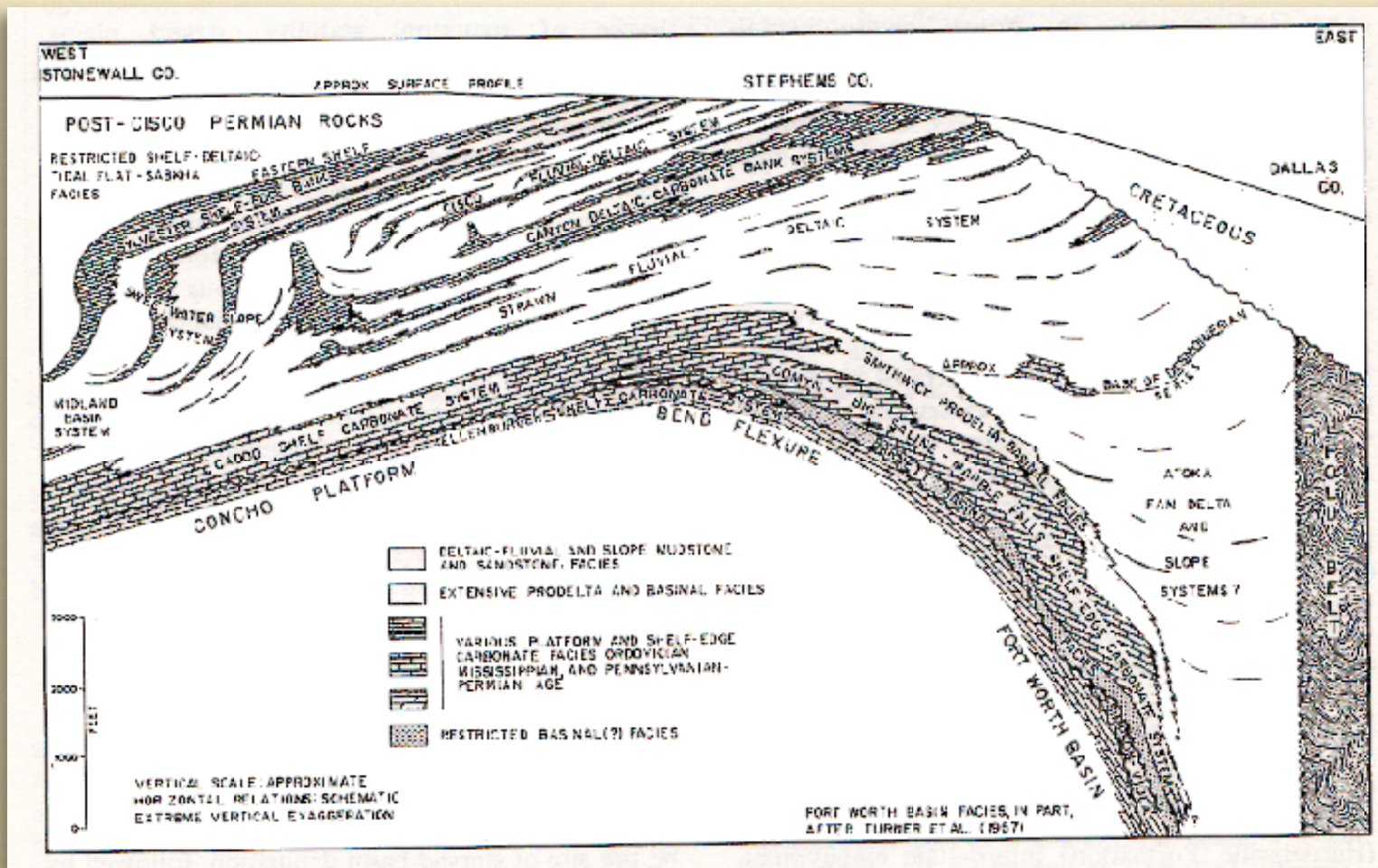
Reports & Collections - April 29th

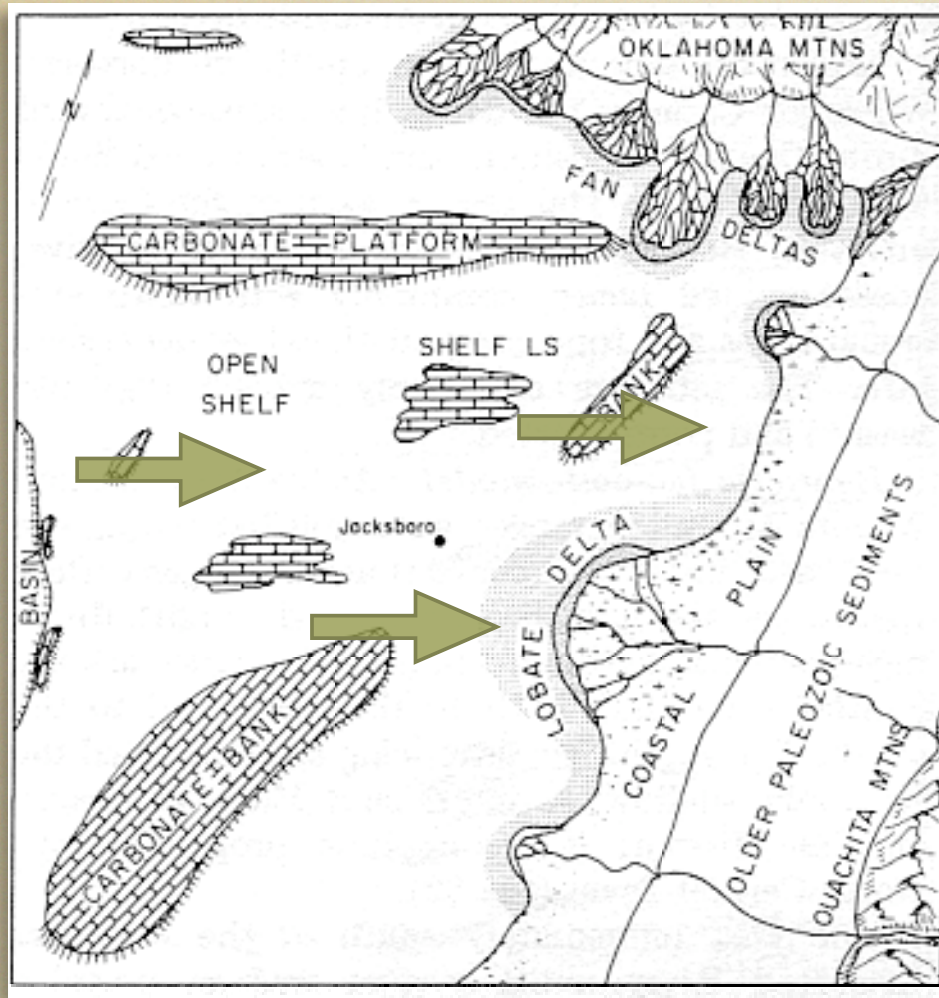
I will be glad to review reports at any time.

Structural Features - North Central Texas



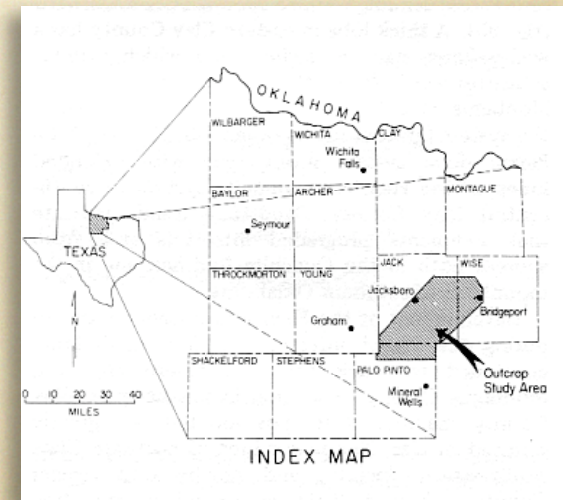
Eastern Shelf Cross Section





“Crude” Paleogeographic Reconstruction

Open Shelf
Interdeltaic Bay
Near Delta



Deltas

