

RENFREW INSTITUTE GEOLOGY FIELD TRIP MARCH 18, 2006 OUTLINE

SCHEDULE:

9:15	Depart Renfrew Institute
	Part 1 – Rodinia and the Iapetus Ocean
9:45 – 11:00	Stop 1. Cydonia Sand Company
11:00 – 11:20	Travel
11:20– 11:40	Stop 2. Rhyolite Exposure in Buchannon Valley
11:40 – 12:00:	Travel
12:00 – 12:30	Lunch - Ardrentsville
	Part 2 - Pangaea
12:30 – 12:40	Travel
12:40 – 12:55	Stop 3. Border Fault
12:55 – 1:10	Travel
1:10 – 1:30	Stop 4. Gurseys Railroad Cut
1:00 – 1:45	Travel
1:45 – 2:15	Stop 5. Aspers Basalt
3:00	Arrival back to Renfrew Institute

1. Cydonia Sand - Valley Quarries, Inc., Fayetteville, PA
 - Working 2 pits, we will visit Pit 2
 - Rock exposed is the Antietam formation composed of sandstone
 - A fossil in this rock is known as *Scolithus lineraris*, a worm tube that lived at the beach 600 million years ago (mya)
 - This fossil is known as an index fossil – meaning the species lived for a short time (several millions of years). Any rock around the world containing *Scolithus* is considered to be 600 my old.
 - In which direction are the rocks dipping (tilting) into the earth?
 - Can you see any folding or faulting within the quarry?
2. Buchannon Valley Fire Department metarhyolite exposure
 - This rock originally known as rhyolite was lava about 620 mya.
 - With the orogeny(ies) that affected the rhyolite, this rock has been metamorphosed (mineral content), thus the “meta” in front of the name.
 - This rock formed on the edge of Rodinia as the supercontinent rifted apart.
 - Rhyolite has the same minerals as granite, the other difference on how the rocks were formed.
 - This rocks belongs to the Catocin formation of Proterozoic age.
 - As you walk this small exposure, look for rhyolite that might have flow lines or some indication of lava flows.

3. Quaker Valley - The Border Fault
 - This valley represents the border between rocks of South Mountain (about 600 mya) to those of the Piedmont Gettysburg-Newark Section containing rocks about 200-170 mya. We are standing on the younger side.
 - This fault was active in at least the Mesozoic Era as Pangaea was rifting apart.
 - This is the western side of what is called the Gettysburg Basin, a downwarped piece of crust that had much erosion of sediment in and the intrusion of magma up through the rifting crust.
 - Quaker Valley is a valley because rocks in a fault area have been previously fractured and crushed, allowing quicker weathering and erosion to take place.

4. Guernsey Railroad Cut – Triassic Sedimentary Rocks
 - Exposed here are sandstones and siltstones of the Gettysburg formation about 209 mya.
 - Which rock is finer-grained – siltstone or sandstone?
 - Which rock forms in thicker layers - siltstone or sandstone?
 - What do you think makes this rock appear reddish?
 - In what direction are these rocks dipping?
 - Dinosaur foot prints, petrified wood, fern fossils, rain prints, ripple marks and mud cracks are been seen within this formation.
 - Based on all of the evidence, these rocks were deposited in a swamp, shallow rivers or lake environments.
 - During the Triassic period, we had highlands both to the east and west of the Gettysburg Triassic Basin. With periodic abundant rainfall, a lot of sediment got washed into this rift valley.
 - Combined thickness of the Triassic formations in this area is at least 25,000 feet thick.

5. Main Street, Bendersville Road Cut – Aspers Basalt
 - Most magma that intruded into the Triassic rocks and older rocks cooled inside of the earth as the rock diabase.
 - All of these intrusions are Jurassic in age.
 - The Aspers Basalt is the only evidence in this region that was an actual lava flow – a very small flow but it did exist.
 - There may had been additional flows, but these may have been eroded away.
 - This exposure shows you just how difficult it is sometimes for a geologist to interpret the geology. This rock is concealed and only can be found when you dig into the hillside or walk into the orchard.
 - Look for a light-brownish rock that is potted with cavities. These cavities were like “gas pockets.”

