Name:_____ Date:_____

Bedrock Correlation in the Hudson Valley Worksheet

Read the paragraph below discussing the regional geology of New Paltz and the Shawangunk Mountains.

> Exit 18 on the Thruway leads to the town of New Paltz, gateway to the Shawangunk Mountains. Rt. 299 west passes through the center of town and crosses over the Wallkill River and its broad floodplain eroded into the Normanskill Shales. These shales were deposited in the Late Ordovician during the Taconic Orogeny as high mountains to the east eroded and the sediments were swept into a deep foreland basin that subsided adjacent to the uplift. By the end of the Ordovician thousands of feet of sediments filling the basin were themselves caught up in the Taconic collision and uplifted. Exposures of dark Normanskill shale can be seen along Rt. 299 approaching the base of the Shawangunk Ridge. At the intersection of Rt. 299 and Rt. 44/55 the road begins its climb up the face of the ridge. Midway up the ridge front is a hairpin turn in front of a large exposure of Normanskill shale. The bedding of the shale appears to be horizontal at this spot, but keep looking as we continue to climb the hill. Not far uphill from the turn the shale beds are steeply tilted and can be seen to be overlain by beds of white conglomerate outcropping farther up the hill. Unfortunately, the contact between the Normanskill shale and Shawangunk conglomerate (an angular unconformity) is not visible at road level.
> *From The Regional Geology of Southeastern New York State for Teachers and Travelers Field Guide.*

Questions – Use your reference tables as you answer the following questions.

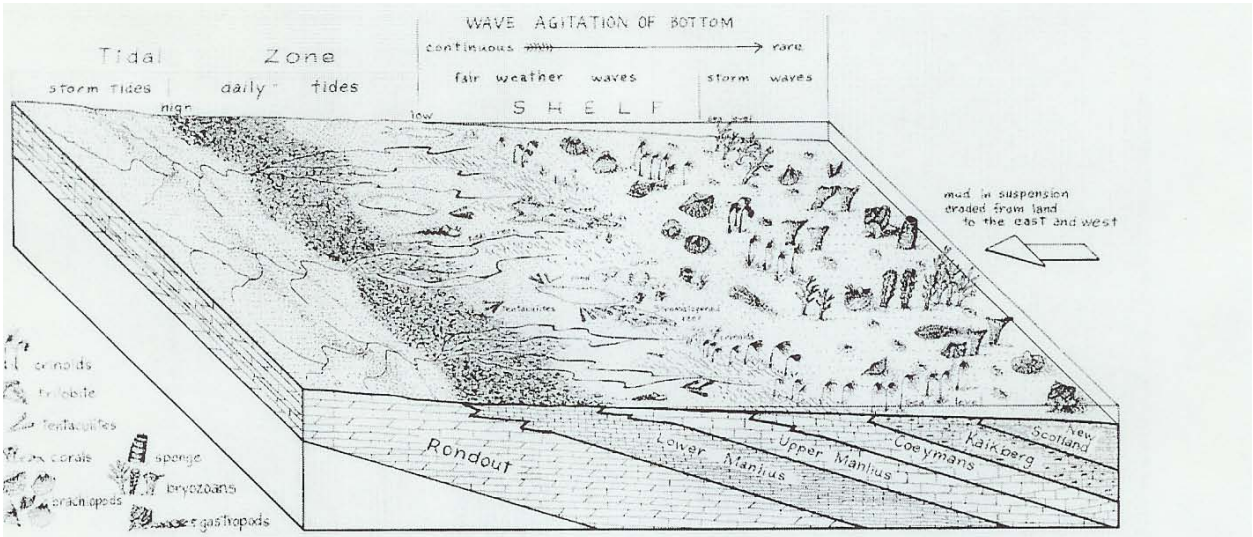
1. The paragraph above mentions the Taconic Orogeny. How did the Taconic Orogeny occur (use the reference tables)?

2. The person who made this trip was tracing the layer of Normanskill shale across the Walkill floodplain all the way up to the Shawangunk Ridge. What method of correlation is this?

The diagram at the top of the next page shows the shallow sea environment that existed in the Hudson Valley during the Lower Devonian Period.

3. What kind of trilobite might you find alive during this time?

4. What kind of brachiopod?



ure 8.5. Diagram relating depositional environments to the different facies of the Helderberg Group. The water depth increases from left to right. The arrangement of the facies—ndout through New Scotland—indicates that the depositional environments have been moving from right to left as the deposits accumulated. You can verify this fact by drawing a through the facies below and parallel to the sea floor. This line will represent the sea floor at an earlier time. Notice that the depositional environments on that earlier sea floor were he right of the present ones. Compare this figure with Figure 8.6.

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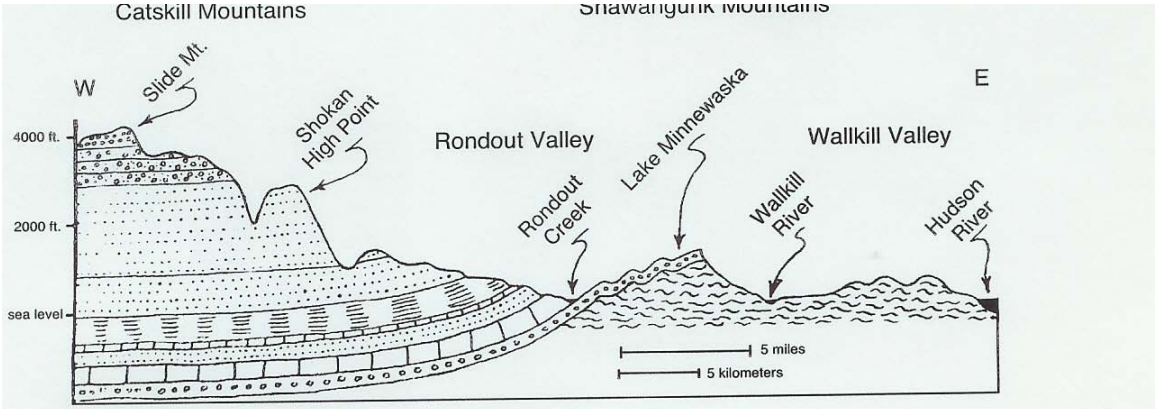
5. What kind of unconformity exists in the diagram above?

6. In the diagram above, what is the name of the layer that was laid down first?



Cross section showing orientation of strata from Hudson River west to the Catskill Mountains.

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7. Using the diagram above, what is the elevation gradient between Slide Mountain and Rondout Creek? Show your work.

8. On the left side of the diagram, write out the order of the layers making up Slide Mountain with 1 being the oldest and increasing in number as the rocks get younger.

9. What geographic area in the diagram is a perfect example of the law of superposition?

10. The youngest rock layer covering the Shawangunk Mountains and Lake Minnewaska is a quartzite conglomerate, a type of rock made of older pebbles cemented together to make a new rock. What law of correlation does this type of rock illustrate?