

Field Guide to “Ice Age” Geology of the Laurel Highlands

Presented for the Galey Geology Excursion -2004
Powdermill Nature Preserve



by
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PAIS Publication Number 2

2004

YELLOWSTONE



IMAGING

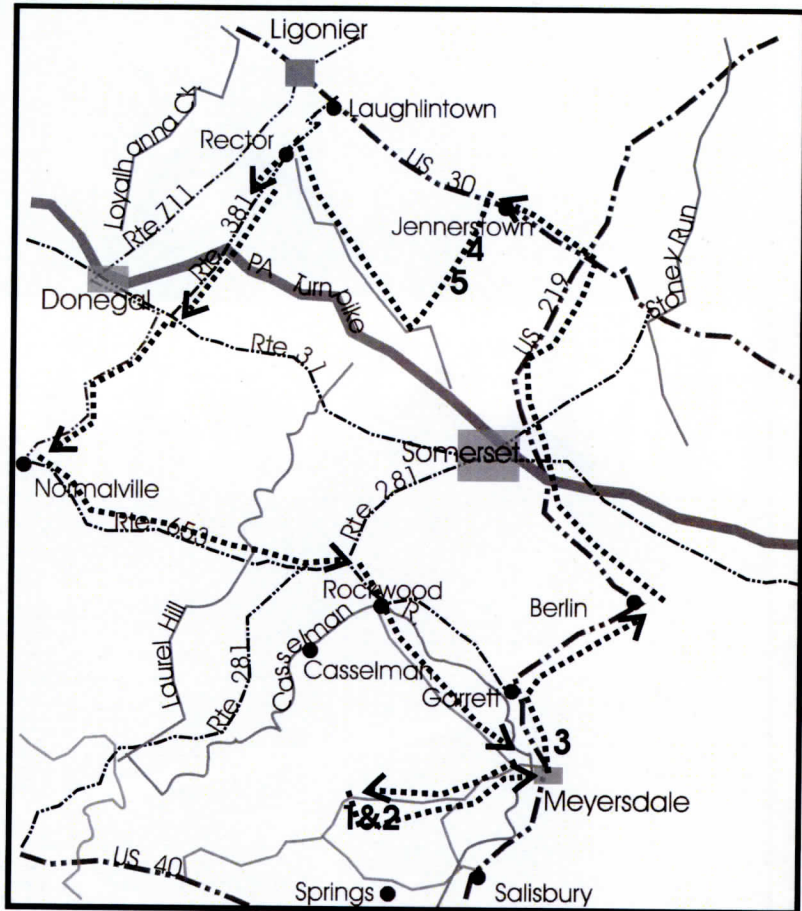
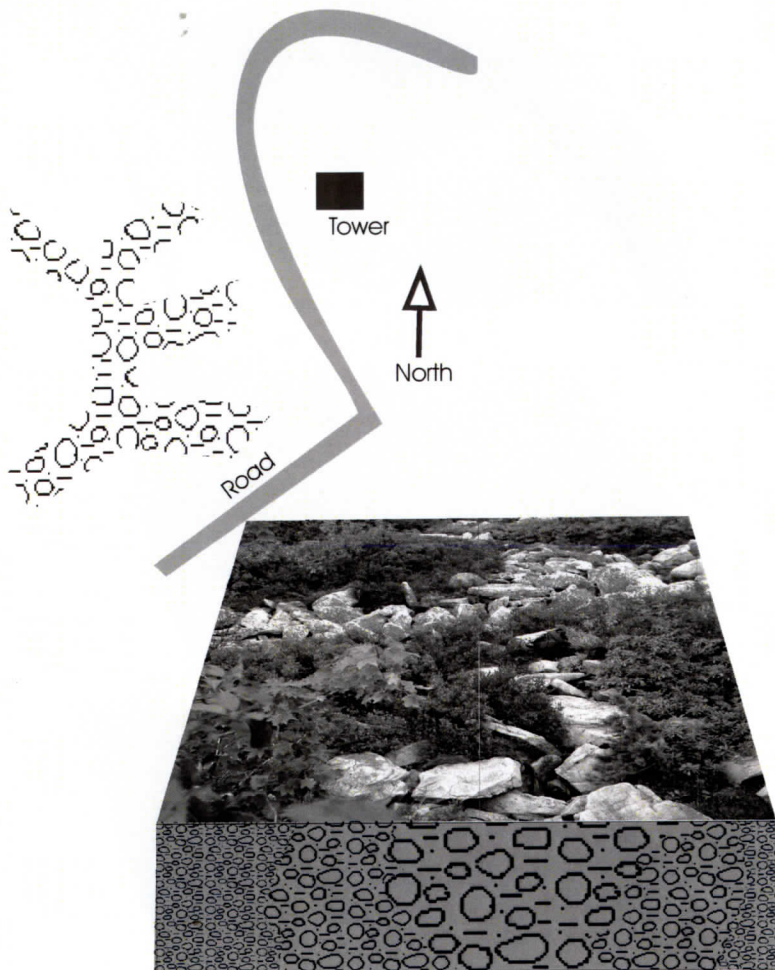


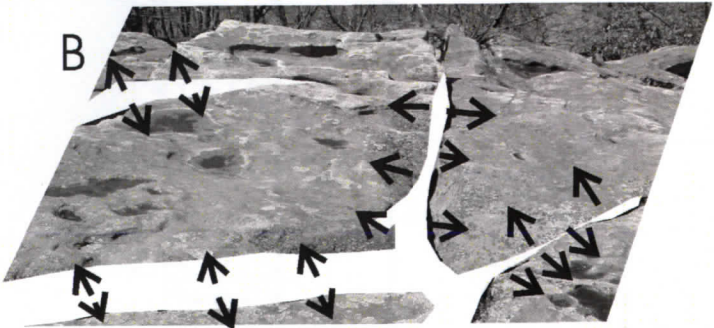
Figure 1.--Location map for field trip route through the Laurel Highlands, with numbered stop locations.



Stop 1

Here at Mt. Davis we can observe a number of preserved periglacial (near glacial) features. These features formed within tundra conditions that were not in ice contact

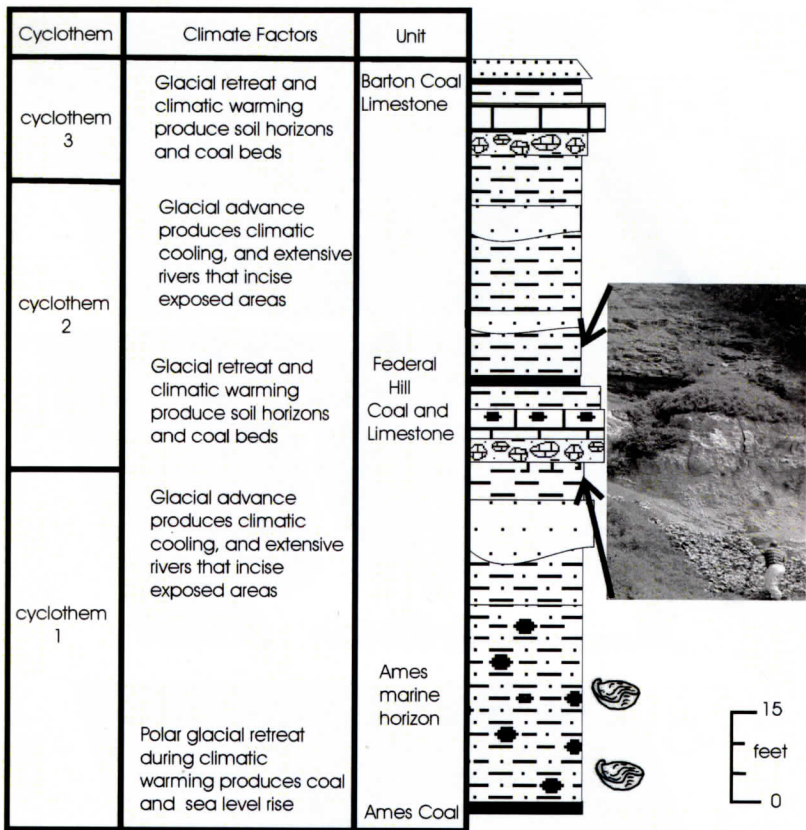
At Stop 1 we will examine patterned ground or frost polygons. Such features are formed in soils that are permanently frozen (permafrost). The repeated freezing and thawing of the surface of the permafrost. This process tends to sort loose boulders according to size. The significance of these features is that while we are located well over 100 miles from the edge of the Pleistocene ice sheet, deep freezing conditions existed even at this distance. Please see wayside diagram at base of tower for further illustrations.



Stop 2

At Stop 2 we will see an example of a “rock city” at Baughman Rock. These features occur throughout the Appalachian Plateaus Province of western Pennsylvania. They are the result of intense freezing conditions that occurred in the tundra conditions during the Pleistocene (Ice Age). These features get their name because the blocks of sandstone appear to be buildings separated by the alleyways of the intervening fractures.

Prior to the Pleistocene this rock ledge had fractures developed in it, but they were closely spaced. As water and ice filled these cracks during the cold conditions of the Pleistocene the freezing wedged apart the individual blocks of sandstone and formed the rock city.

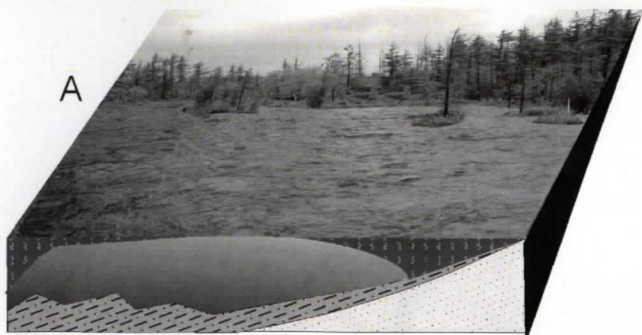


Stop 3

At this stop we will examine the relationship between cyclothem (cyclically deposited intervals of rock) and the waxing and waning of continental glaciers during the Late Paleozoic Ice Age, some 300 million years ago.

During the geological time interval known as the Pennsylvanian Period, Pennsylvania was located at between 10 to 15 degrees below the equator. In the high latitudes ice sheets regularly advanced and retreated during repeated climatic cycles.

These climatic cycles produced major drops in sea level when ice advanced, and major rises in sea level when the ice melted. These fluctuations in sea level produced the cyclothem that characterize the rocks of the Pennsylvanian Period throughout the world.



Stop 4

At stop 4 we will discuss the significance and origins of bogs.

Most bogs found in western Pennsylvania owe their origins to the climates of the Pleistocene (i.e., Ice Age). Increased rainfall during ice advances inundated low, poorly-drained areas that formed glades (A). The cold climate prompted the growth of such plants as sphagnum moss (B). Mats of such plants grew on the surface of the bog, producing low oxygen, acidic conditions in the water below. Thus, the sphagnum mat covered the glade while open water existed beneath it (C). The bog subsequently filled from the sides and top down rather than from the bottom up.

Such bogs are interesting ecological features, supporting unusual acid-loving plants that are rare elsewhere.