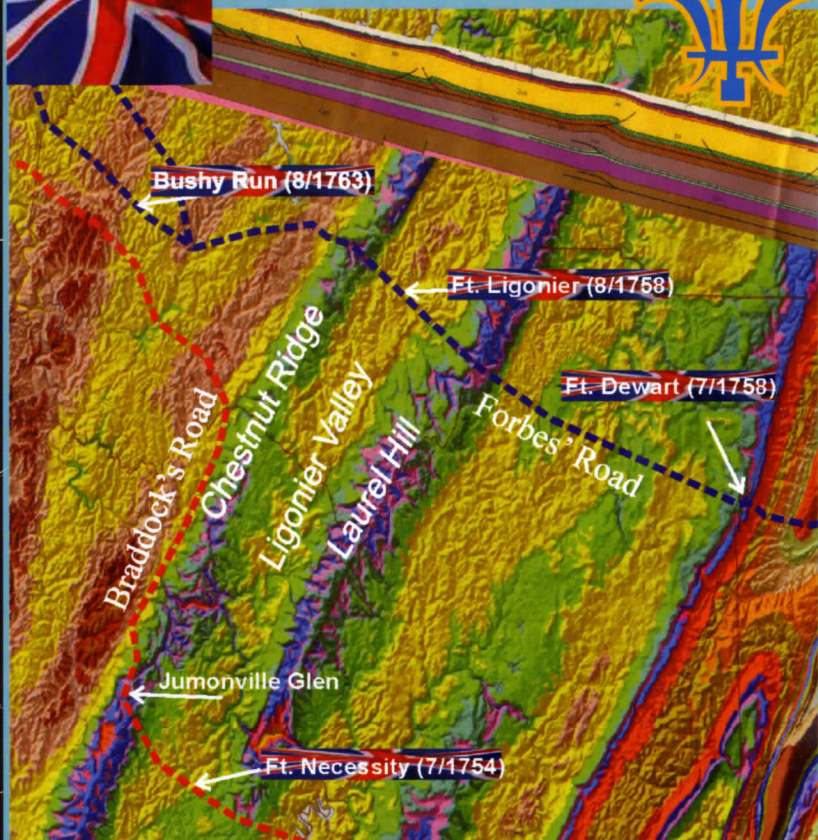


Geology and the French and Indian War in Western Pennsylvania



base map-Pennsylvania Geologic Shaded-Relief- PaGS, 2003

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PAIS Publication Number 4

2005

YELLOWSTONE



IMAGING

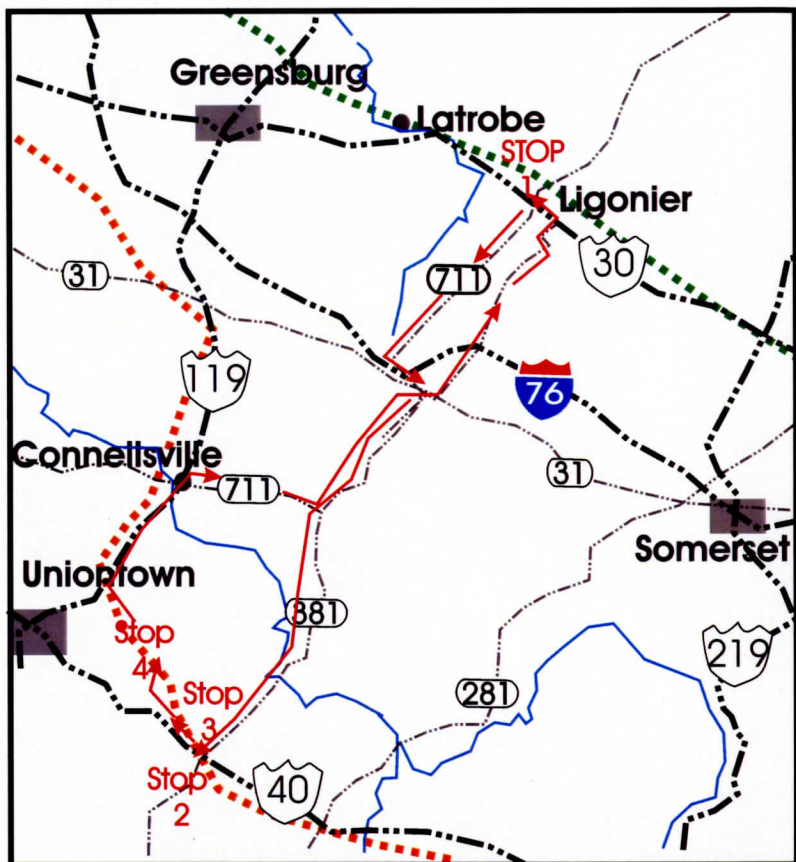
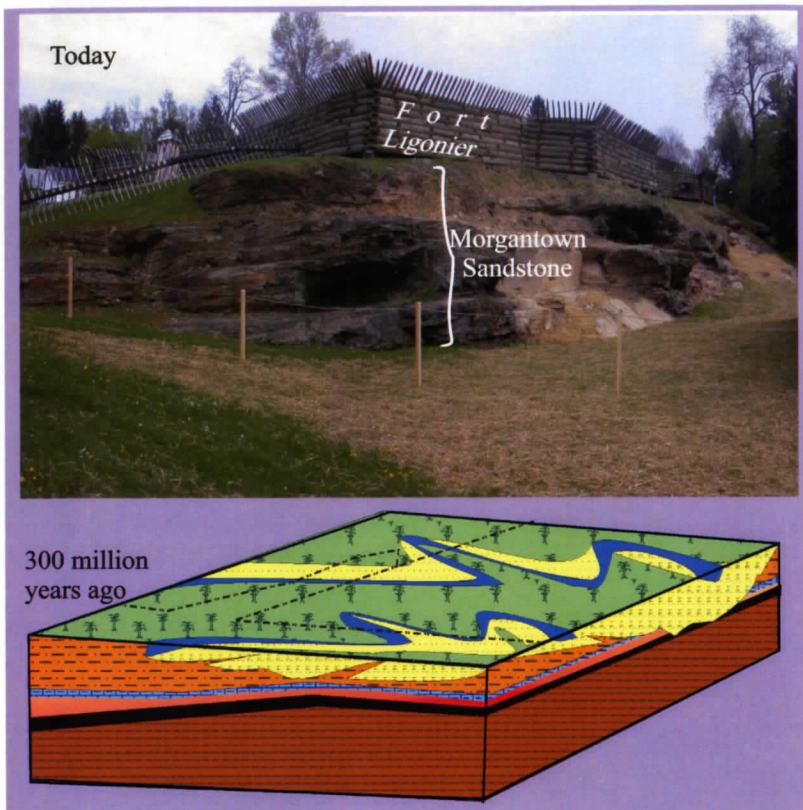


Figure 1.--Location map and field trip route through the Laurel Highlands, with numbered stop locations. Braddock's Campaign route of 1755 is illustrated by, and Forbes' route of 1758 is indicated by

The French and Indian War (1754-1763) or the Seven Years War as it is known in Europe, embroiled much of the world in what some historians have termed "the first world war." Battles during this war were fought, in addition to North America, Europe, Africa, and Asia. Although many of the greatest battles of this war were fought elsewhere, much of the origins of this conflict are owed to events that transpired in western Pennsylvania.

On this field trip it will be illustrated how the geology of the bedrock played an important role in the initiation of this war as well as the major campaigns that were to follow in western Pennsylvania.



Stop 1- Fort Ligonier

Along Forbes' Road in the center of the Ligonier Valley syncline, Bouquet built, in the summer of 1758, a fort along the banks of Loyalhanna Creek. This was the last of numerous forts constructed in the campaign to take Fort Duquesne. Unlike Braddock three years earlier, the Forbes' campaign advanced westward in Pennsylvania in a slow and methodical way as he built defensive fortifications approximately a day's march apart. Fort Ligonier was attacked on a number of occasions during the conflict and was manned for the remainder of the war. Most other fortifications were almost immediately abandoned.

Fort Ligonier was constructed in a defensive position along the banks of Loyalhanna Creek. The site occupies a promontory situated between Loyalhanna Creek and a small tributary to the north. The resistant sandstone ledge on which the fort was constructed acted as additional defensive fortification. This sandstone unit at the site of the fort is assignable to the Morgantown Sandstone of the Conemaugh Group.

The Morgantown Sandstone is an ancient river deposit formed more than 300 million years ago. At that time all of western Pennsylvania was at or near the equator and covered by tropical forests and swamps. Flowing through these forests and swamps were immense river systems that carried sand from the eroding Appalachian Mountains in eastern Pennsylvania. The sandstone layers were bent into the Ligonier Valley syncline approximately 250 million years ago.



A



B



C

Stop 2 - Fort Necessity

Along the trail constructed by General Braddock during his campaign against Fort Duquesne in 1755 is the site of George Washington's first military defeat. The Great Meadows in which Fort Necessity was constructed is one of many "meadows" of the Appalachian Plateaus Province. Most of these meadows represent sites of Ice Age bogs. Remnants of bogs are found throughout western Pennsylvania, but are more common in the Laurel Highlands. They owe their origins to the wet and cold climates of the Pleistocene Period (i.e., Ice Age). The increased rainfall seen during the Ice Age inundated low, poorly-drained areas forming glades or shallow lakes (A). The cold climate prompted the growth of sphagnum moss and other acid-loving plants which produced thick accumulations of peat that soon filled the bog (B). Bogs are interesting ecological features in that they support unusual acid-loving plants that are rare elsewhere. Such swampy conditions tend to inhibit tree growth and thus create a meadow.

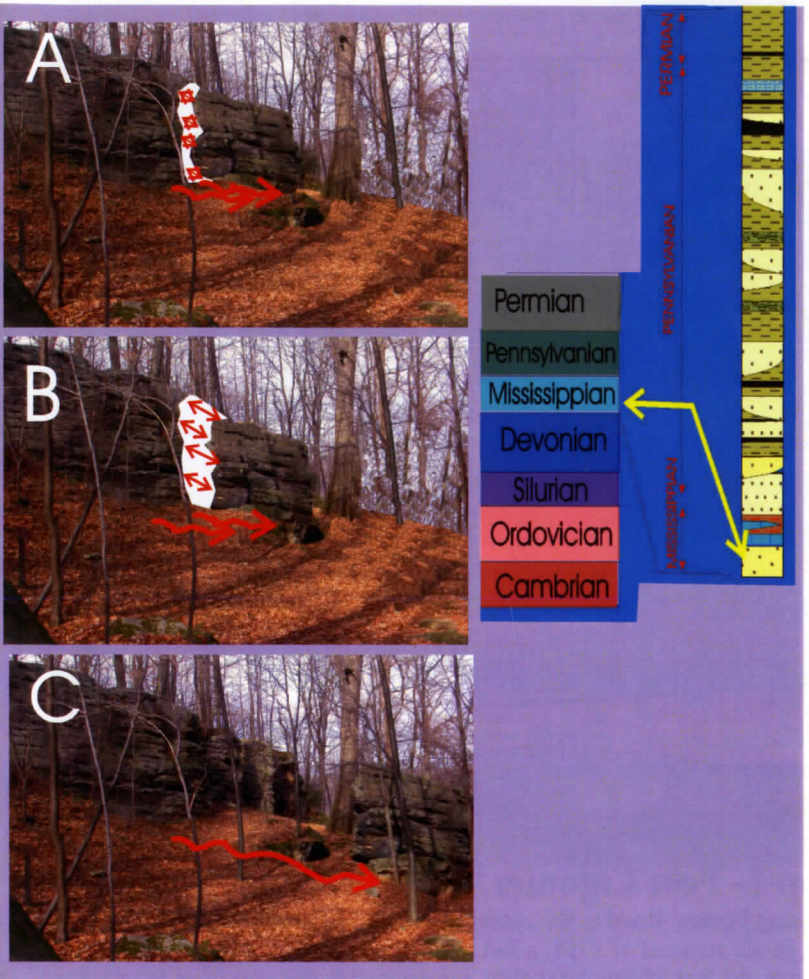
Here on July 3-4, 1754, British and Colonial troops under George Washington fought a force of 700 French and Indians, that had pursued him here after the Jumonville incident.



Stop 3 - General Braddock's Grave

Stop 3 is of little geologic importance, but of great historical importance. This site is located on Braddock's trail as it veers north of Route 40. This site is located in the synclinal valley between the Chestnut Ridge and Laurel Hill Anticlines. These great upward bends in the earth's crust are locations where oil and natural gas tend to accumulate. The intervening valley is a downward fold called a syncline. While synclines are great places to drill for water, they rarely are sites of hydrocarbon accumulation. This synclinal valley is continuous with the Ligonier Valley along Route 30 and the site of Fort Ligonier.

It was here on July 14, 1755 that General Braddock, who had been wounded five days previously at the Battle of the Monongahela (Braddock, Pennsylvania), was buried. His original grave was placed in the middle of the road that bears his name. He was placed here to conceal the grave's location. Nearly half a century later his remains were disinterred and placed near the National Pike at the site of the stone monument (inset).



Stop 4 - Jumonville Glen

Some historians point to the happenings here on May 28, 1754 as a major factor igniting the French and Indian War. Here Washington's men fell upon an encampment of French soldiers led by Ensign Joseph Coulon de Villers, Sieur de Jumonville. The wounded Jumonville was killed by Indians accompanying Washington.

Jumonville Glen is on the crest of Chestnut Ridge Anticline. It exposes some of the oldest rocks that can be seen in western Pennsylvania. These rocks are assignable to the Mississippian age Burgoon Sandstone. The Burgoon was formed in an ancient river system about 340 million years ago. The ledges that we now see are the result of mountain building that uplifted and folded Chestnut Ridge and the rest of the Appalachian Mountains about 250 million years ago. Much more recently the sandstone blocks have been moved into their current position. Individual sandstone blocks became detached along fractures called joints(A). These fractures were wedged apart by ice during intense freezing of the Ice Age (B). The underlying permafrost allowed the blocks to move downslope by freezing and thawing (C).