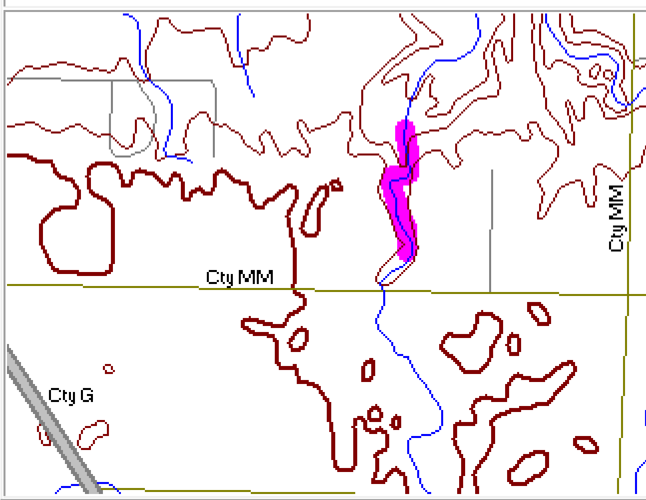
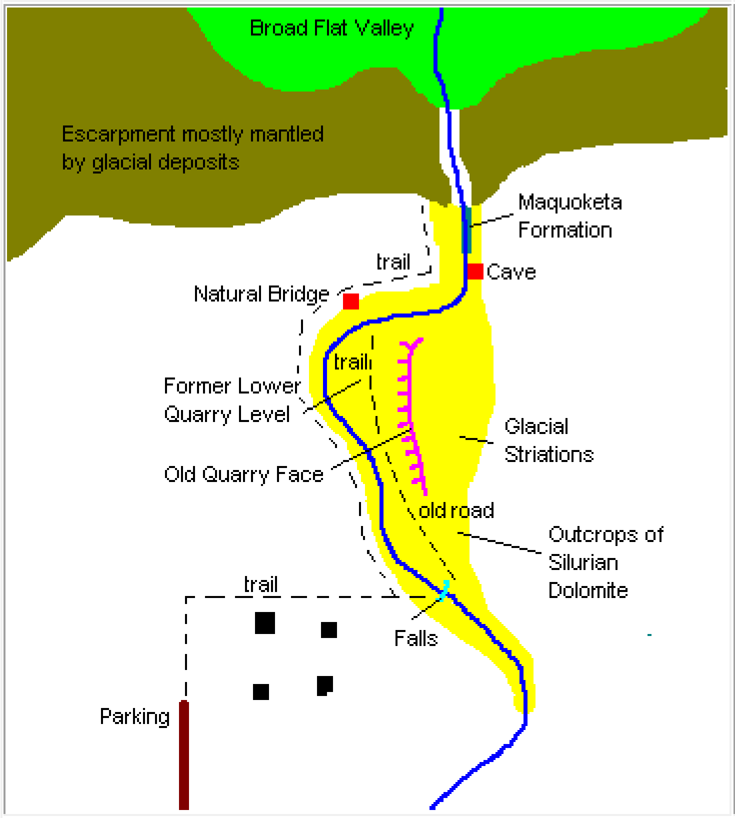
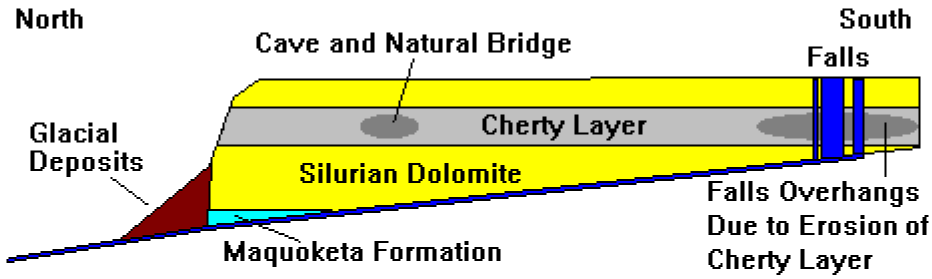
Fonferek Glen

Steven Dutch, Natural and Applied Sciences, University of Wisconsin - Green Bay
First-time Visitors: Please visit Site Map and Disclaimer. Use "Back" to return here.



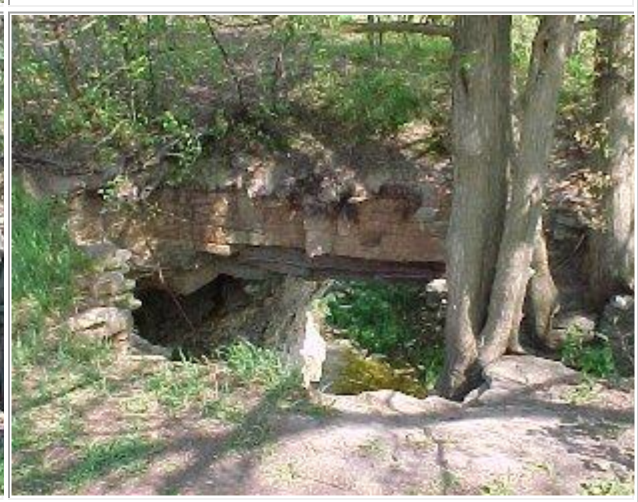
	Fonferek Glen is part of the Brown County Park System, with access made available through the generosity of the Fonferek family. The Silurian Escarpment here runs east-west roughly along the 800-foot contour. This is the southern edge of a deep buried valley that cuts the escarpment. The northern edge of the valley begins just south of the University of Wisconsin-Green Bay campus. In the intervening 12 kilometers there are no Silurian outcrops.
	Sketch map of Fonferek Glen. The map area is about 1/4 mile long from north to south.



A cross-section along Fonferek Glen. Because the glen is located in a deep re-entrant more than 5 km east of the edge of the Niagara Escarpment, and because the layers in this region slope very gently to the east, the Silurian dolomite is much thicker here than at Wequiock Falls or Kittel Falls. The underlying Maquoketa Formation is only exposed in a very small area at the extreme north end of the gorge at the very base of the bluffs. The falls retreat not by undermining the Maquoketa formation as at Wequiock Falls or Kittel Falls, but by undermining a weak cherty layer in the dolomite itself. This weak layer is also attacked by weathering to form the small cave and natural bridge downstream.

Fonferek Falls

The Natural Bridge

	According to one account, the initial opening of the bridge was made by a cow who stepped on a thin spot in the roof of a small cave. There is surprisingly little geologic literature on the role of cows in forming natural bridges.
	At left and below are two views from the north side of the bridge looking down through it.
	

The Lower Gorge

The Cave

	Viewed from the west. Note the prominent joint extending from top to bottom of the cliff and through the cave. Seepage along this joint probably speeded up weathering of the cherty layer and was responsible for creation of the cave.
	A view of the lip of the gorge. Note how the overlying layers collapse by breaking along joint planes.
	A view from just north of the cave

	A view from the north end of the gorge

The Maquoketa Formation

	The north end of the gorge. The cliff is Silurian dolomite, but Maquoketa Formation is exposed under the overhang.
	Maquoketa Formation is barely visible under the overhang. It is distinguished from the Silurian dolomite by its bluish color (compared to the buff dolomite) and its thin bedding.

The easiest way to collect samples is to go north (downstream) and watch for patches of bright blue-gray material in the stream bed, eroded from under the overhang and carried down by spring floods.

Beyond the Gorge

Views of the gorge from above, looking north. The bluffs are banked with talus and glacial deposits. North of the bluffs the valley opens into a wide glen.

	
	West of the stream, showing the beginnings of the gorge. Bedrock occurs in the hill in the foreground. Note the distant wall of the lower gorge, cut into Pleistocene deposits.

Jointing

The Niagara Escarpment is so straight that a geologist's first suspicion is that the escarpment was shaped by joints. However, joints of the right trend (about 020-030 degrees) are uncommon in this region, and in most places the escarpment is not a smooth joint surface. However, here joints of the right orintation are common. One is shown here, looking north. Note that one side of the joint appears to have been uplifted slightly. It's not clear whether the movement is due to crustal movements or just local settling of the rock due to quarrying and erosion of the gorge. Also the joint appears to be made up of staggered, or *en echelon* segments, each offset to the right from the next. This pattern suggests *left-lateral* shear, that is, if you face the joint, the stresses would tend to push the opposing side to the left.

There are several joints like the one shown above, all uplifted a few centimeters to the west and indicating left-lateral shear. It is not known if the uplift is tectonic, related to loading by ice, or purely local shifting related perhaps to the quarrying.

Rare but very long joints with trend 020 degrees suggest that the escarpment was joint controlled but that once the bedrock was scoured away on one side of the joint by the glaciers, erosion and fracturing along other joints created the irregular face we see today.

Ice-Flow Indicators

Adjacent to the old quarry are smooth, glacially-polished outcrops with striations in several directions. There seem to be two sets of striations, one trending about 210 and the other about 160. Some striations may have been made by machinery but these two sets seem consistent enough to have been made by ice flowing in two different directions.

Created by Steven Dutch, Natural and Applied Sciences, [University of Wisconsin - Green Bay](#) *19 June 1999, Last Update 14 April 2000*