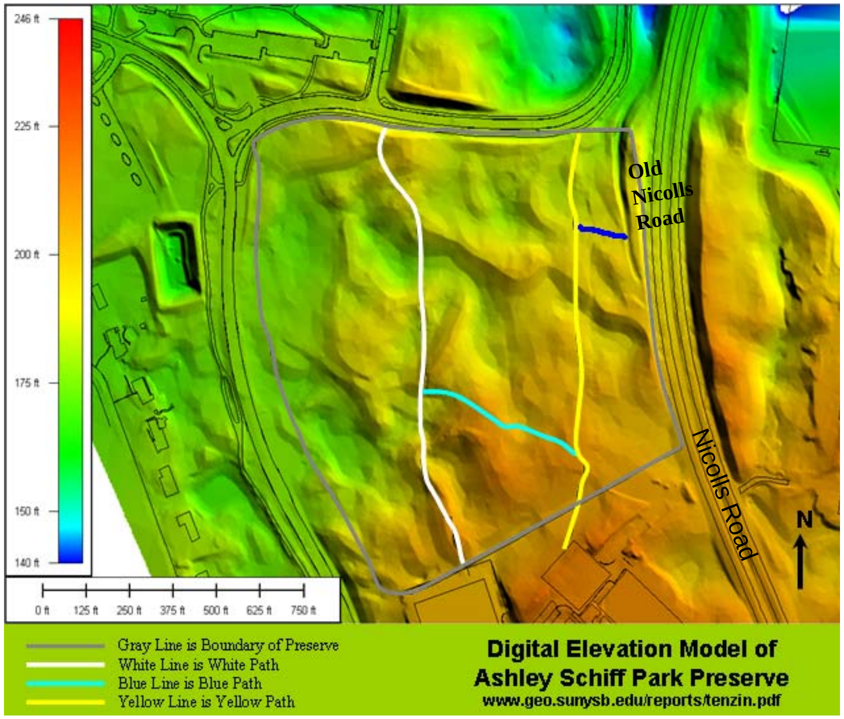

6. Fallen Trees

Look around and you will see many trees that have fallen and are now resting on the ground. Like all living things, trees eventually die. When this happens, the properties of the wood are transformed. Take a look at the rotting wood at this station. Use your sense of touch to compare this wood with that of a living tree. What role do you think insects and microorganisms have in changing the wood's properties? Do you think that all wood decomposes at a similar rate? Dead trees form an important part of a forests ecosystem. Providing homes for birds and small mammals. Grubs and beetles in the decomposing wood provide food for many birds, especially wood peckers.

7. Where Do Leaves Go?

Every year, the trees in this deciduous forest lose their leaves. One would expect that the pile of leaves on the forest floor would grow thicker each year. If this is actually happened, would you be able to walk the forest easily? Dig down through some of the litter you see around you. Notice how the character of the litter changes with depth. So what is happening to the forest leaves? What are the processes involved? Finally, who are the major players of these processes? Earth worms greatly increase the rate of decomposition of litter. Earth worms are not native to Long Island. During the glacial times the ground was permanently frozen which killed off the worms. The worms were first introduced by the colonists who brought potted plants from Europe.

8. Development

We have left the Ashley Schiff Park Preserve and are in a developed part of the area. Picture how the area may have looked before the development and how the preserve may look if it were to be developed. Many of the topographic features which tell us so much about the glacial history would be destroyed.

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Ashley Schiff Park Preserve Science Walk

Take only pictures. Leave only footprints

STONY BROOK
STATE UNIVERSITY OF NEW YORK

Introduction

Stony Brook campus is located on the Harbor Hill Moraine, which was formed approximately 20,000 years ago during the last glacial advance. The ridges and valleys found in the Ashley Schiff Park Preserve were developed by folding and faulting as a result of the pushing action of the glacier from the north to the south-- a glacial tectonic process. This is a process similar to that found in plate tectonics, where one plate pushes against another.

1. Exposed till

As the glaciers that once covered Long Island receded, they left behind till. Till is an unsorted mixture of compacted clay, silt, sand, gravel, cobbles and boulders found at the base of a glacier. A one-meter thick surface layer of erosion resistant till is found near the surface at most places on campus. Till has preserved the glacial topographic features on campus from natural erosion.

The glacier as it moves forward over sediments or basement rocks picks up some of the underlying material and transports it in a very active interface. In the interface the fragments are subjected to abrasion and fracturing. Some of the fragments may be carried 100's of miles in this interface. Most of the fragments are carried a significantly shorter distance. Observe the shape of the cobbles exposed here. Notice that some are rounded while others are quite angular. What caused them to be shaped this way? Did the rock fragments all come from the same rock?

2. Garnet bearing rock

Look down on the path. You will see a cobble of schist, which is a metamorphic rock. This rock formed by subjecting mud to intense heat and pressure deep within the earth's crust. A close look reveals larger crystals on its surface. These are garnets, a semi-precious stone. You may also see mica along with other minerals. How did this rock get to the surface of the earth after being formed far below the surface?

3. How large is this rock?

The rock exposed here is pegmatite. An igneous rock is a pegmatite if it consists of large crystals of quartz and feldspar. Look closely for visible crystal shapes on its surface. Most of this rock is buried. How large is it? What force of nature could move a rock of this size? If it had been a block of ice and melted, it would create a depression known as kettle hole.

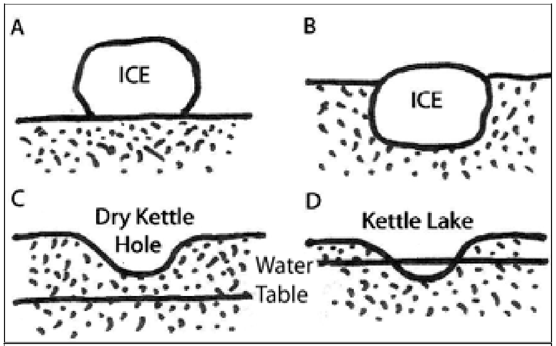

Fig. 1 A block of ice from the glacier is left by the glacier (A). The block is buried by glacial sediment (B). After the block of ice melts it leaves a depression, a kettle hole. If the bottom of the kettle is above the water table the kettle hole will be dry most of the time (C). The water table at this location is 140 feet below the surface. Thus, there is no standing water in this kettle. If the bottom of the kettle hole intersects the water table the kettle hole will contain a lake or pond (D). (Drawing by David Altizio.)

4. Kettle hole

You are now standing in a kettle hole. This was a place where a large block of glacier ice was buried in the surrounding sediments and melted leaving a depression. Would you expect all kettle holes to be of the same size or shape? Once ice melts, where does the water go?

5. Topography

Note that the topography in this part of the Ashley Schiff Park Preserve is very irregular with many small ridges and valleys. These small ridges and valleys formed when the glacier, like a bulldozer, pushed the underlying sediments (Fig. 2). As the pushing continued faulting occurs and the layers rise towards the surface. The result is a fold and thrust belt. This process is similar to the formation of the Allegheny Mountains, except that this is glacial tectonics not plate tectonics. Ground penetrating radar studies of this ridge (Fig. 3) show that the underlying sediments are folded and faulted in a manner similar to that shown in Fig. 2.

As you go over a ridge, the underlying sediment is exposed. What properties tell you that this sediment is the same as at stop 1?

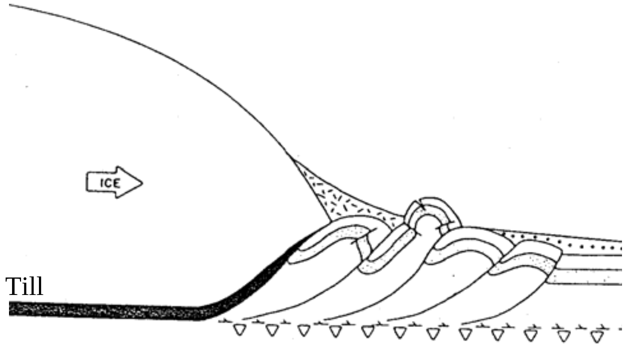

Fig. 2 Cross-section showing a glacier pushing the underlying sediments into folds and faults. The thick black line at the base of the glacier is till.

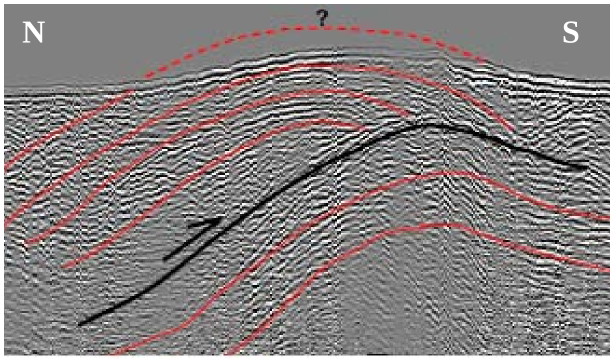

Fig. 3 This cross section determined by ground penetrating radar exposes folds and faults extending some 50 feet below the surface. Compare the features shown here with those in Fig. 2. Part of the fold has been removed by erosion. (Figure from C.W. Tingue)

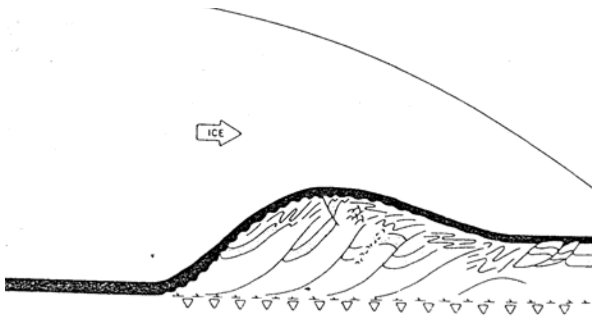

Fig. 4 The removal of the top of the folds as shown in Fig. 3 and the presence of till at the surface throughout the park preserve suggest that the glacier continued over this area as shown in this figure.