A TRIP THROUGH TIME BENEATH OUR FEET

Standing on the soil here at Hard Bargain Farm one tends to think of history, of land made old by centuries of people working it. But the land is young, geologically speaking. You could drive 45 minutes north to Baltimore and stand on a part of North America that is 500 times older.

Hard Bargain Farm lies on the part of our continent called the Atlantic Coastal Plain. This is the geologist's descriptive way of noting that the region sits along the coast of the Atlantic Ocean, and is for the most part a relatively flat plain, carved up here and there by rivers.

The Coastal Plain is a recycled stretch of continent, made up of worn down bits of the Piedmont and mountain regions to the west of us. What were once the heights of Montgomery and Frederick counties now lie beneath us, as most of the coastal counties from Cape Cod to Georgia have been formed from the debris of their inland neighbors.

Our land is so young that the sediments deposited here have not yet formed new rock.

A well-driller's log tells the local story.

Dig down into the ridge where the farmhouse stands, and you'll find a layer of coarse gravel, made up of rounded stones, yellow, pink, orange and grey in color, interbedded with layers of sand. This gravel was left here about 2 million years ago, when the Atlantic Ocean lapped along its coast at approximately the Prince George's-Charles County line. Hard Bargain Farm would have been beachfront property back then. A delta formed where the Potomac River emptied into the ocean. Here the river dropped its load of bits and chunks of rock eroded from the highlands upstream.

This gravel terrace is only about 20 feet thick. The well driller who dug the new farmhouse well in 1940 recorded the sequence of sedimentary layers through which he drilled. Below the gravel is a layer of pink clay mixed with some fine sand. This stuff is about 80 feet thick. Underneath this is a bed of greenish sand and clay about 40 feet thick.

This "greensand" (which turns rusty brown when exposed to air because bits of it are indeed rusting) is about 60 million years old. Mixed in with all this clay and sand are the fossil remains of clams, snails and other creatures that lived back when all this sand and mud was settling to the bottom. The nature of the sand, and the types of creatures that left the fossils, tell us that the bottom on which they settled was ocean bottom. What is now a farm was once part of the continental shelf, covered with the waters of the Atlantic Ocean.

Below the greensand (we are now at a depth of 140', about 10 feet above the level of the river at the edge of the farm) is a very thick and mixed up layer made up of sands, clays and gravels. These sediments were laid down about 100 million years ago, sometime during the last days of the dinosaurs. These beds are about 400' thick, down

another 390' below the level of the river. The sediments here are no marine in origin, but were laid down along the flood plain of a river. The history of the coastal plain is a story of rising and falling sea level. During the time when the dinosaurs were enjoying their last years on earth sea level was low enough to leave what would become Hard Bargain Farm far enough ashore to be a swampy floodplain.

At this point, or rather depth, in the well driller's log he has struck a good source of water, and his notes end. That is because below this thick bottom layer of sediments lies the hard crystalline rock of an older part of the continent. Water cannot flow through this "basement" rock, but collects and saturates the more porous sediments above, supplying the farmhouse with a good source of well water.

The sediments at the top of the ridge at Hard Bargain Farm are about 2 million years old. There are places around Baltimore where you can stand on rocks over a billion years old. That makes us pretty youthful, a part of the continent just settling down as it were. But each rounded piece of gravel we step on, brought here and deposited 2 million years ago by an ancient river, is hundreds of millions of years old, coming here from an ancient landform upstream. The worn and rounded shape of each piece of gravel tells of many miles of tumbled travel along some streambed. The history of each piece of coastal plain is older than the coastal plain itself.

The sedimentary layers below us have names. The topmost layer is Sunderland gravel. Below it lies the pink clay of the Nanjemoy formation, and the greensand and clay of the Aquia formation. The thick bottom layer of sediments is the Potomac formation.

The recent history of Hard Bargain Farm has been one of erosion. Sea level has been low, and the river and its creeks have been carving valleys into the land. But sea level is rising again. It can be surmised that, in the not too distant geologic future, new layers of marine sediments will cover the farm fields we have etched onto our piece of the coastal plain.

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