

Buttons and Other Concretions

Even the name Button Bay ties it to its unique geology. During glacial times, several types of clay were deposited here. The calcium which occurred naturally in the Champlain Sea cemented the clay into many interesting shapes. The most common concretion looked like an old-fashioned button mold. British soldiers during the Revolution were the first to call this "Button Mould Bay."

Today, button-like concretions are still formed in the waters around Button Bay. These modern buttons are created when clays are drawn together around a plant, small rock or other nucleus.

For more information visit the Nature Center and talk with the resident summer naturalist.

Other resources:
 Button Bay Fossil Sheet
The Nature of Vermont
 by Charles Johnson

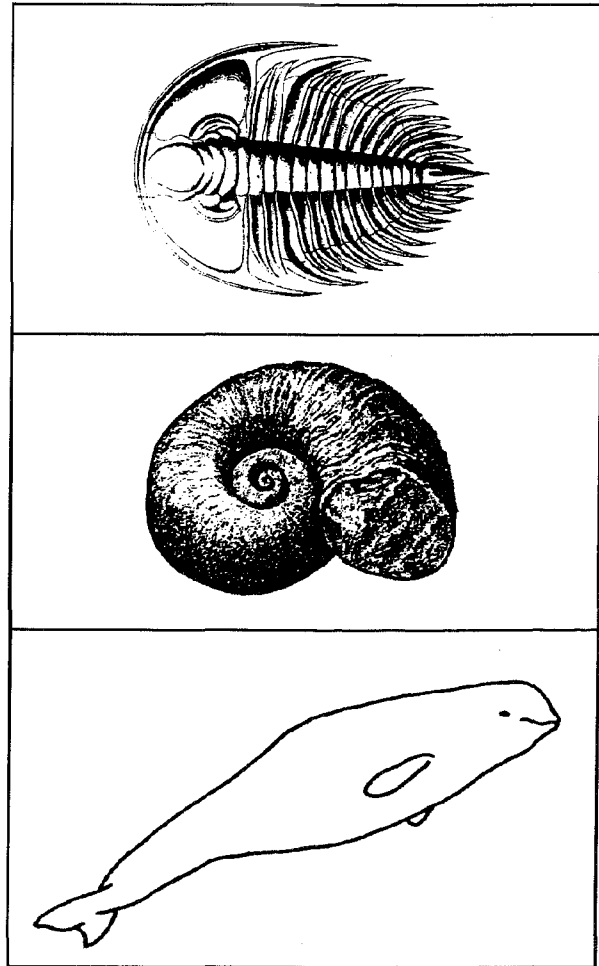
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J. Zarzynski



The Geology of Button Bay

A Unique Natural Area



Vermont Agency of Natural Resources
 Department of Forests, Parks
 and Recreation
www.vtstateparks.com



THE GEOLOGY OF BUTTON BAY

buttons



trilobite



Button Bay is an excellent place to study geology. The bedrock is very old and contains fossils from a time when life did not exist outside the primordial sea. The clays contain interesting "rocks" resembling buttons.

Because this is a state designated natural area, collecting of fossils is not permitted.

Introduction to Plate Tectonics

The earth's surface constantly shifts and changes. This is because it is made of large thin plates floating on hot magma. The magma bubbles and creates currents, causing the plates to move.

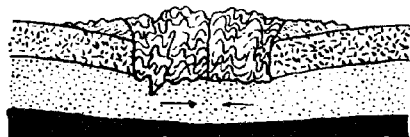
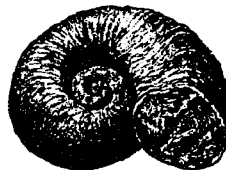


Plate Tectonics and Button Bay

500 million years ago, this area was a shallow shelf off the coast of an ancient land mass positioned near the equator. In the shallow tropical seawater, life flourished.

450 million years ago, the earth's plates began moving together. The shallow shelf was thrust above sea level when the plates collided. Here at Button Bay, ocean sediment, shells and organic debris cemented into limestone.

Button Island was part of a coral reef extending north through Grand Isle. This area now contains some of the oldest fossilized coral in the world. Ship Island has fossilized trilobites - a long-extinct crab-like creature - sandwiched between its shaly layers. Along the nature trail, look for large fossilized sea snails coiled next to a long cavity in the limestone.



Subsequent shifts, due to changes in the convective currents of the magma, have continued to separate and unite the world's plates. Throughout these movements, the Champlain Valley remained buffered from the intense heat and pressure shaping mountains further to the east. For this reason, its fossils are intact in sedimentary rock.

The Sculpting of Button Bay: The Ice Age

Five million years ago, the climate turned sharply colder. Ice and snow fell and accumulated year-round. As the collected ice mass increased, its great weight caused it to spread slowly southward. Like a monstrous snowball, the glacial ice gathered debris in its wake, transporting boulders as easily as pebbles to far off places.

The glaciers carved the soft sedimentary rock in the Champlain Valley. Large parallel grooves in the limestone at Button Point indicate where debris in the ice scoured the bedrock.

Until 10,000 years ago, ice covered Vermont, periodically melting back when the climate warmed for a while. The last warming trend began 12,000 years ago. As the ice melted, exposing the Champlain Valley, it acted as a plug at the northern end. A large lake formed as meltwater drained into the valley. This lake, named Lake Vermont, was 500 feet higher than the present day Lake Champlain.

Button Bay was again submerged, this time beneath chilly waters. Surrounding hills like Mt. Philo (a state park) were islands. Mt. Philo still has a sandy beach halfway up, indicating its former shoreline.



The Champlain Sea

Although the glacier was melting, it still held a lot of our continent's fresh water. The sea recovered at a much faster rate and slowly seeped down the St. Lawrence Valley in Canada, then through the ice plug into Lake Vermont. The lake became a sea, its chilly arctic waters hosting a second wave of marine life in the Champlain Valley.

In the thick clays deposited by the glacier at Button Bay, geologists have found clam shells related to arctic species living today. In nearby Charlotte, railroad workers found a complete whale skeleton.

Many fish species like sturgeon also entered into the sea. And for those with imagination and scientific hope, the great grandparents of Champ - Lake Champlain's famous sea monster - came to reside here. Champ's history parallels that of his more famous cousin, Nessie.