Welcome to The University of Vermont's Perkins Museum of Geology

Courtesy of University of Vermont Department of Geology
Trinity Campus, Delehanty Hall, ground floor, 180 Colchester Ave., Burlington, VT 05405
* Email: geology@uvm.edu * See Website for visitor information: http://www.uvm.edu/perkins/

LIST OF EXHIBITS
THE UNIVERSITY OF VERMONT PERKINS MUSEUM OF GEOLOGY

Exhibits 1-5 are in the front lobby of Delehanty Hall.

1. Dinosaur footprints
These dinosaur footprints are of the same approximate age (Jurassic period) as (Exhibit 4), but were formed on land rather than in the sea. They were collected from a famous footprint locality in central Massachusetts. Paleontologists cannot be sure exactly what dinosaur made the footprints because no bones have ever been found preserved with them, therefore, known as trace fossils.

2."Emerging Ammonite"
This sculpture is a larger-than life model of an ammonite, a prehistoric marine organism. The sculpture was carved in Champlain Black Marble by sculptor James L. Sardonis.

3. Red slate benches
The red benches are made of slate, a metamorphic rock formed by subjecting mud and shale to high heat and pressure. The red color is due to oxidized iron-rich minerals in the rock. The slate is from the Indian River formation of the Taconic Mountains. (Gift of Tatko Brothers Slate Products, Middle Granville, New York).

4. Ichthyosaur
This is a plaster cast of an Early Jurassic marine reptile that lived near present day England 150 million years ago. The original fossil from which this cast was made is housed in the British Museum of Natural History.

5. Fossil cast
This is another plaster cast of a prehistoric reptile, crocodilian in appearance.

Exhibit 6 is on the wall opposite the museum entrance.

6. Centennial Geologic Map of Vermont (1961) and the Hitchcock Map of Vermont (1861)
By making a series of 13 traverses through the Green Mountains, Edward Hitchcock and his sons produced the first geologic map of Vermont in 1861, which stood as the standard for 100 years. In 1961, a group of geologists led by Charles Doll created a commemorative and updated version of the initial Hitchcock map: the Centennial Geologic Map of Vermont. This map was constructed in the context of the then newly proposed (late 1950s – early 1960s) concept of ***seafloor spreading***, which was used to support the idea of ***continental drift*** and the theory of ***plate tectonics***.

Exhibits 6A-38 are in the museum, beginning with Bedrock Geologic Map of Vermont.

6A. Bedrock Geologic Map of Vermont
Researchers from the U.S. Geological Survey, Vermont Geological Survey, UVM Geology faculty member, Char Mehrtens and UVM emeritus Barry Doolan and contributions from 66 UVM geology alums, and others created the map that was unveiled at the State House on April 11, 2012. Installed May 30, 2013, it is the only permanent large exhibit of the map in the state at 96% of the 2012 version.

7. The Vermont Collection: Rocks, Minerals, and Fossils
These wooden cabinets, hand-crafted by Robert Trithart in 1993, house a collection of *rocks, minerals, and fossils* from Vermont; the collection features:

- Minerals from Eden Mills, Vermont: a classic mineral-collecting locality that contains grossular garnet, vesuvianite, diopside, and other minerals
- Ordovician fossils: gastropods, trilobites, cephalopods, and other inhabitants of the reefs and shallows of the ancient Iapetus Ocean Brandon lignite: the best example of flora (plants) from the Tertiary Period that exists in New England.
- Pleistocene and recent fossils: post-glacial fossils including elk and caribou antlers; Champlain Sea fossils; and the cast of a mammoth's tooth.

8. Polished Cephalopod Slab
Coiled and uncoiled cephalopods are seen in a slab of polished limestone from the quarries on Isle La Motte, Vermont. It is of Middle Ordovician age: approximately 460 million years old.

9. Petrified Tree Stump
Petrified wood forms when wood is buried in mud and water, such as in a swamp. Over time, minerals precipitate out of the water and fill in spaces in the wood. The wood eventually decays, leaving it its place hardened minerals that look like wood! This process is known a permineralization. Another piece of petrified wood can be seen at the back of the museum.

10. The Paleozoic Era
The Paleozoic Era of geologic time (570 million years ago (mya) to 230 mya) spanned the time from the first appearance of fossils with preservable hard parts at the beginning of the Cambrian Period until the mass extinction at the end of the Pennian Period. The Paleozoic was marked by the rapid expansion of invertebrate (spineless) life forms, the evolution of vertebrate life fonus, and the movement of life from the seas to terrestrial (land) environments.

11. The Mesozoic Era
The Mesozoic Era of geologic time (230 mya to 65 mya) is known as the "Age of Dinosaurs". During this time a large, diverse, and highly adaptable group of reptiles (dinosaurs) developed and spread rapidly into a number of environments. Significant events occurred, such as radical climate changes, extensive volcanism, the disappearance of many ecological niches, and the evolution of flowering plants. The era ended with the great "Cretaceous Extinction" 65 mya.

12. The Cenozoic Era
The Cenozoic Era of geologic time (65 my a to present) is known as the "Age of Mammals". The rapid spread and diversification of mammals, the development of grassland environments, and the slow cooling of the environment have characterized the Era. Although humans are mammals, human evolution can be traced back only about 2.5 million years!

13. Wilson A. "Snowflake" Bentley print is located around this corner
The light box contains an enlargement of one of the photographs of snowflakes taken by this Vermonter in the late 1800's. (Produced from an original glass lantern, this slide was provided by the Jericho Historical Society).

14. **The Dark Room**
See minerals in a new light! This darkened room allows the display of minerals whose finer qualities would not be evident in regular light. The collection includes:

- Prime specimens: some of the finest mineral specimens from our collection - Agate slab: a backlit slab of agate. The bands are caused by slight mineral impurities in the crystalline silica structure.
- Quartz: a large chunk of quartz (crystalline silica) containing inclusions of the mineral biotite.
- Fluorescent minerals: when subjected to invisible, ultraviolet light, these minerals emit energy in the form of visible light that we see as a variety of unusual colors.

15. Rock Processes display case is against the glass wall of the triceratops skull room.
Specimens of many varieties of the three basic types of rocks: igneous, metamorphic, and sedimentary are exhibited with a brief description of the processes involved in their formation.

16. Glacial Processes
For hundreds of thousands of years, great ice sheets have repeatedly covered Vermont: the ice has shaped much of the landscape. The record of humans in Vermont did not begin until after the most recent ice sheet retreated, approximately 10,000 years ago. This exhibit includes:

- Examples of rocks showing glacial polish and striations, caused by the pressure exerted on the rocks by the great masses of ice.
- Maps of glacial lakes and the prevailing direction of glacial ice flow across Vermont
- Fossilized remnants of Ice Age mammals such as mammoths, mastodons, and caribou.
- The Reagan site: although the exact date is uncertain, this site from along the Lamoille River is regarded as one of the earliest human sites in Vermont.

17. The Charlotte Whale: Vermont State Fossil (declared in 1993)
This is the skeleton of an 11,000 year-old beluga whale, found in Charlotte, Vermont in 1849 by a railroad construction crew. The whale was preserved in the blue clay and mud of the Champlain Sea, and of the ocean that covered this area for over 2500 years. Zadock Thompson and A.D. Hagar in the 1850s and 1860s reconstructed the skeleton.

18. Hands-on Exhibit
In the wooden boxes you can find samples of the three main rock types: Igneous, sedimentary, and metamorphic. A variety of schists, slates, gneisses, marbles, and phyllites may be observed in the metamorphic box. The sedimentary box holds sandstones, dolostones, mudstanes, conglomerates, and limestones. You can also find samples of gabbro, basalt, diorite, andesite, granite, and rhyolite in the igneous crate. Using the "Rock Cycle" handout for guidance, see if you can identify some of these rocks. Please put the samples back when you are finished. Please keep the rocks in the box or on the mat. Parents, teachers, and chaperones please supervise children.

19. Cephalopod located next to the Dark Room.
This is a large cephalopod, a prehistoric marine organism. It was found on Isle La Motte, Vermont and later restored by Frank Zaske in 1993.

20. History of Biosphere: Examples of Evolution in the Fossil Record
View the selection of fossils - from the Vermont State collection - that show the evolution of the horse and the shark by examining their teeth, some as old as 50 million years before present.

21. The Fossil Records

22. Hologram
This exhibit is best viewed by standing between exhibits 23 and 24, or from further back by the Triceratops excavation room. Refrain from touching the image or the screen; it damages the quality of the projection.

This life-sized hologram of the skull of a Triceratops was produced for the St. Louis Zoo from an original skull. The skull of this Late Cretaceous dinosaur was found in Montana in 1908 and is housed in the American Museum in New York City. (Hologram is courtesy of Holographies North Burlington, VT).

23. The Mount Holly Mammoth Tusk
The tusk of a mammoth, a huge land mammal that lived during the most recent ice age, is on permanent loan to Mount Holly Community Historical Museum, Mount Holly, Vermont, because it is the location where the tusk was discovered. In 1848 a railroad construction crew found it in a bog in Mount Holly, Vermont. A smaller tusk is in the Glacial Processes Case in exhibition # 16.

24. Topographic Relief Map of Vermont.
This large topographic map, showing the differences in elevation of the Vermont landscape, was produced in 1931. The general north-south orientation of the physical features (the Green Mountains, Lake Champlain, etc.) can clearly be seen. A 3:1 vertical exaggeration makes the mountains appear three times taller in relation to the valleys than they actually are.

25. Marine Life, Modern and Ancient
This exhibit presents a variety of marine invertebrate fossils, many preserved in limestones of the Middle Ordovician Chazy Group, a fonnation observed on Isle La Motte, Vermont. On the other side of the exhibit, a variety of modern marine invertebrate organisms, particularly corals, are displayed.

26. Rock-forming minerals: The mineral collection is displayed in two cabinets.
See common minerals such as quartz, feldspar, mica, amphiboles, pyroxenes, calcite and sulfides, and some of the finest mineral specimens from the Perkins Museum collections. NOTE: *Hughesite*, a mineral discovered in 2008, is named in honor of UVM geology professor Dr. John M. Hughes for his life-long contribution to the study of mineral structures.

27. Mineral properties
Examples display basic mineral properties such as hardness, color, luster, cleavage, and others.

28. Projection Screen/Smart Board
This screen has been removed.

29. Granite benches with xenoliths
These benches of solid Barre granite (granodiorite) were cut and polished by the Densmore Stone Company of South Burlington. The large, irregular, dark chunks are xenoliths: pieces of bedrock that were incorporated into the slowly-cooled magma which formed the granite.

30. Exhibit in progress

31. Microscope
A variable magnification, binocular microscope is available, upon request, to examine the world of fossils and minerals. The images can be projected on to the Projection/Smart Board. Advanced request and supervision are required. Contact the UVM Perkins Geology Museum by leaving a message at 802.656.8694 or sending an email to: geology@uvm.edu. The pedestal is made of Bethel white granite, a TWO-mica granite composed of quartz, feldspar, and both muscovite and biotite mica. The pedestal and microscope were donated by Rock of Ages Granite Corp.

32. Stages of Lake Vermont/Champlain Sea/Lake Champlain
Redrawn from Chapman by UVM student Caroline Herzog, this series of illustrations depicts the changing levels of the succession of bodies of water in the Champlain Basin (Lake Vermont, the Champlain Sea, and Lake Champlain) following the retreat of the glaciers until the present day.

33. Triceratops Preparation Room
In this room, the skull of a triceratops dinosaur is being prepared for display. The protective plaster coating is carefully being removed as the bones are revealed.

34. Petrified Wood
This multicolored rock is a preserved section of an ancient tree. Although the wood has been replaced by a mineral, silica, the bark and growth rings can still be seen.

35. Unearthing Connections: The Use of Stratigraphy in Geology and Archaeology
Although entirely different disciplines, many people don't realize just how interconnected archaeology and geology truly are. Through exploring the concept of stratigraphy, and its use in a specific excavation done by UVM's Consulting Archaeology Program, we see how important these geological concepts can be to archaeologists in the field.

36. Structure of the Earth
What is the inside of the Earth? What is it made of? How do we know? This exhibit examines what is known about the Earth's Interior, in addition to processes such as plate tectonics and seafloor spreading-fundamental theories in geology.

37. Earthquakes and Volcanoes
Earthquakes and volcanoes are some of the more visible results of the interaction of the huge tectonic plates that make up the surface of the Earth. Sometimes subtle, sometimes spectacular, their causes and effects are depicted here.

38. Museum Floor
The floor under your feet is made of polished granite. The gray is the classic "Barre" granite, from Barre, Vermont; the white is the "Bethel" white granite. The granite flooring is courtesy of Rock of Ages Granite Corp., Barre, Vermont.