

Glossary of Technical Terms¹

abrasives Gritty materials used for grinding, polishing, or cutting. They are also used in common household products like sandpaper, fingernail files, and nonslip surfaces for floors and stairs.

Acadian Mountains The mountains built by the Acadian Orogeny.

Acadian Orogeny A mountain-building event that happened about 410 to 380 million years ago, when the eastern part of the Iapetus Ocean closed and the small continent of Avalon was attached to proto-North America.

“Acadian Plateau” The high plateau that formed behind the mountains built by the Acadian Orogeny.

acid rain Rain that is so acidic that it damages the environment; caused by pollution from industry and automobiles.

accretion The addition of new crust to a continent.

accretionary prism A wedge-shaped pile of contorted rocks and sediments that are scraped off the down-going plate and added to the edge of the overriding plate during subduction.

adjacent Next to.

aeromagnetic map A map of the earth’s magnetic field made with a special instrument carried in an airplane.

aftershock An earthquake that occurs after a larger earthquake and originates at approximately the same place.

Age of Fishes An informal name for the Devonian Period, when fish thrived in the world’s oceans.

aggregate One of the ingredients that, together with cement, makes up concrete. Gravel and crushed stone are both used as concrete aggregate.

agnostid A kind of small trilobite with head and tail almost alike; one group of agnostids lacked eyes.

Alleghanian Orogeny A mountain-building event that happened about 330 to 250 million years ago, when the continents of proto-North America and proto-Africa collided along a transform margin.

alluvial fan A large fan-shaped deposit of coarse sediments made by a stream at the foot of a steep slope.

alluvial plain A flat land surface formed from deposit made by a river.

alluvial sediments Sediments deposited by a stream or flowing water.

alumina Aluminum oxide (chemical composition Al_2O_3). It is found naturally as the mineral corundum.

ammonoid An extinct kind of shelled cephalopod; important in determining the age of sedimentary rocks.

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amphibian A cold-blooded vertebrate that is able to live both on the land and in the water.

amphibolite A dark-colored metamorphic rock composed of the minerals amphibole and plagioclase.

amplitude The height of vibration of a wave.

ancestral Adjective describing a feature that existed in the past.

anhydrite A light colored mineral found in evaporate deposits. Its chemical composition is CaSO_4 .

anorthosite An igneous rock composed almost entirely of the mineral plagioclase.

anthracite grade The metamorphic grade that produces the highest quality of coal.

anthraxolite A black substance similar to hard asphalt found in veins in sedimentary rocks.

anticlinal trend The map direction of the long axis of an anticline.

anticline A fold in rock that is convex upward.

anticlinorium A large anticline

Appalachian Basement Rock in eastern New York that lies below younger rock that was deformed during the formation of the Appalachian Mountains.

Appalachian Basin A basin that held a shallow inland sea during most of the Paleozoic Era. Many of the sedimentary rocks exposed in New York State were deposited in the Appalachian Basin.

Appalachian mountain-building episodes The Taconian, Acadian, and Alleghanian Orogenies.

Appalachian Upland An area of high elevation in the Appalachian Mountains.

aqueduct A structure that carries a large quantity of flowing water.

aquifer An underground body of saturated rock or sediment that is both porous and permeable enough to provide useable quantities of water.

archaeocyathans Sponge-like creatures that built reefs in the Early to Middle Cambrian seas. Note: *Archaeocyathans* is the plural of *archaeocyathid*.

Archean Adjective referring to the oldest part of geologic time, from the formation of the earth up to 2.5 billion years ago.

arctic climate A very cold climate found north of the arctic circle.

arête A sharp ridge in rugged mountains, formed by glacial erosion.

arkose A sandstone rich in the mineral feldspar, commonly pink or red in color.

arkosic sandstone A coarse-grained sandstone rich in the mineral feldspar.

arthropod An invertebrate animal with a jointed body and limbs, usually with a hard covering. Insects, spiders, lobsters, crabs, barnacles, and the extinct trilobites are all arthropods.

asthenosphere A soft, flowing layer of the upper mantle; it lies under the lithosphere.

at depth Deep below the earth's surface.

Atlantic Coastal Plain The low, wide plain along the east coast of North America.

attached echinoderms An echinoderm that grows attached to the sea bottom.

Avalon A small continent that was attached to proto-North America during the Acadian Orogeny.

axes The plural of *axis*. An axis is a string line that divides a shape into two symmetrical halves.

Baltimore Canyon Trough A large buried basin on the continental shelf south of Long Island.

bar A bank made of sand or other sediments, at least partly underwater, along the shore or in a river.

barrier island A long narrow, sandy island, built by waves near a beach.

barrier shoal An underwater sandbank or sand bar roughly parallel to the shoreline.

basalt A dark-colored, dense rock formed from molten rock. Oceanic crust is made of basalt.

basalt flow Basalt formed from molten rock that flowed out onto the surface of the earth and hardened.

basaltic lava Molten rock that flows out onto the earth's surface, where it cools and hardens to become basalt.

basaltic volcanism Volcanic activity that produces basaltic lava.

Basement Hinge Zone The zone in an offshore sedimentary basin where the depth of the basement increases rapidly.

basement rock The deeply eroded metamorphic bedrock that is usually covered by younger sedimentary rocks.

basin A depression or low area that holds (or once held) a lake, sea, or ocean.

Bass Island Structural Trend A complex anticline found below the earth's surface in western New York. It is a structural trap that contains oil and natural gas.

beach ridge A long sandy mound on a beach, beyond the reach of storm waves or high tide. It was built by waves and currents when the water level was higher.

bed A layer of rock, usually sedimentary rock.

bedding Layers in sedimentary rock.

bedding plane The flat to undulating surface that physically separates layers of sedimentary rock.

bedding surface A surface within a layered sedimentary rock that represents the original surface where sediments were deposited.

bedrock The solid rock that lies under the soil.

bedrock geology The solid rock of the earth's crust exposed at the surface of the earth; also, the study of that rock. It may be covered by surficial geology.

benchmark A mark on a permanent object indicating elevation; used as a reference in topographic mapping.

bentonite a clay-rich rock that is made from volcanic ash.

biotite a dark brown to black mineral found in both igneous and metamorphic rocks.

bioturbation Churning and stirring of sediment by living things.

birdseye A cavity in limestone or dolostone filled with the mineral calcite or dolomite.

bison Buffalo.

bivalve mollusk An invertebrate animal with a soft body and a shell made up of two parts.

black mica A dark-colored mineral of the mica group, usually biotite.

blast furnace The type of furnace used to refine iron ore.

blastoid A kind of stalked echinoderm

blind thrust Thrust fault in rocks below the surface of the earth, where it can't be seen.

block diagram A diagram that shows three dimensions; for example, geologic cross sections (as in Figure A-4) that also include drawings of the land surface.

bluestone A fine-grained kind of graywacke, bluish gray to olive green in color. It splits into thin slabs and is used for building and paving stone.

bluff A high steep bank or cliff.

body fossil Fossils that represent the mineralized or organic internal or external skeleton of organisms or the impression of the form of the organism. Shells, bones, petrified wood, leaves, and body impressions are types of body fossils.

bog Wet, spongy ground, frequently surrounding a body of open water.

brachiopod An invertebrate sea animal with a two-part shell. Brachiopods have existed from the Cambrian Period to the present and are an important fossil in the correlation of marine sedimentary rocks.

brackish water Water that is somewhat salty.

braided streams Streams that divide into a number of smaller channels that reunite farther downstream.

breccia A rock made of sharp-edged pieces of other rocks that have been cemented together.

brine Water with a high amount of dissolved salts.

brittle deformation The breaking of rock by faulting or fracturing. Brittle deformation takes place in rock at or near the surface of the earth.

brittle structure A break in rock caused by faulting, fracturing, or jointing.

bryozoan An invertebrate sea animal that lives in permanently attached colonies.

buoyant Adjective referring to crust that is lighter than the surrounding crust.

calcareous Composed partly or completely of calcium carbonate. Used to describe sediments, rock, or shells of organisms.

calcareous nodules Lumps of limestone that form within sediments.

calcite A white to colorless mineral (chemical composition CaCO_3). One of the two carbonate minerals; the other is dolomite.

calcitic Containing the mineral calcite.

calcium carbonate A substance (chemical composition CaCO_3) found in the mineral calcite and in animal bones and shells.

calcisilicate rock A metamorphic rock formed from impure limestone or dolostone.

“Cameron’s Line” A major geologic boundary in southeastern New York and New England. It separates rocks formed as part of North America from rocks formed elsewhere.

Canadian Shield The large area of eastern Canada where the oldest rocks in North America are exposed at the surface.

caprock A hard rock layer, usually sandstone or carbonate, that forms the top of a cliff. Also refers to an impermeable rock layer that traps oil or natural gas in the permeable rock layer below it.

carbon-14 A naturally occurring radioactive isotope of the chemical element carbon.

carbonate environment An environment in which carbonate rock is deposited.

carbonate minerals The minerals calcite and dolomite.

carbonate rock Sedimentary rock (like limestone, dolostone, and marble) that was originally formed from sediments rich in carbonate minerals.

carbonate sediments Sediments rich in calcium carbonate.

carbonate sequence Strata of carbonate rock.

carbonate shelf A flat, shallow area where carbonate rock is deposited.

caribou A kind of deer related to the reindeer.

carnivorous Meat-eating

Carthage-Colton Mylonite Zone A narrow zone of intensely deformed rocks in the Adirondack region; it separates the Northwest Lowlands from the Central Highlands.

cascade A small waterfall, especially one in a series.

casts of grooves, tracks, trails, and flutes Bulges formed on the bottom of a sedimentary layer when the sediment fills in various kinds of depressions in the underlying layer.

“Catskill Delta” A huge wedge of sedimentary rock formed in eastern proto-North America during Devonian time. The sediments of the “Catskill Delta” were eroded and transported westward from the mountains built during the Acadian Orogeny.

cementation the process by which loose sediments become consolidated into hard rocks.

Central Highlands The largest part of the Adirondack region; includes the High Peaks region.

cephalopod A group of marine animals that have well-defined heads. Includes squid, octopus, ammonoids, and nautiloids.

Champlain Sea The sea that formed when marine water flooded parts of the St. Lawrence and Champlain valleys after the last Pleistocene ice sheet had retreated from the region.

chain coral A kind of coral that grows in a branching, chain-like form.

channelization Straightening of stream channels to reduce flooding upstream.

charnockite An igneous rock that is similar in composition to granite but also contains the mineral pyroxene.

chemical composition A description of the chemical elements that make up substance. It is usually represented by abbreviations for the elements and numbers that show the number of atoms of each element. For example, water has the chemical composition H₂O; this means that a water molecule is made of two atoms of hydrogen and one of oxygen. The abbreviations for elements used in this book include: Ag=silver, Al=aluminum, C=carbon, Ca=calcium, Cl=chlorine, Fe=iron, H=hydrogen, K=potassium, Mg=magnesium, Na=sodium, Ni=nickel, O=oxygen, Pb=lead, S=sulfur, Si=Silicon, Ti=titanium, Zn=zinc.

chemical element A substance that consists of only one kind of atom.

chemical weathering The breakdown of rock by chemical action.

chert A hard, dense sedimentary rock made of microcrystalline quartz. Flint and jasper are varieties of chert.

chlorite A green-colored mineral found in many metamorphic rocks.

“Christmas tree” Informal name for the complex structure of valves, pipes, and gauges on top of an oil or gas well.

chromite An unusual brown-black to black mineral; it is the major ore of chromium.

cirque A large bowl-shaped area dug out of bedrock at the head of a mountain glacier.

Clarenton-Linden structure A prominent structure on the Allegheny Plateau. At the surface, it is a north-south-trending fold. Below the surface, it is a found zone made up of three or more separate faults.

clast An individual grain or piece of a larger rock mass that has been broken apart by weathering.

cleavage The surface along which a rock or mineral tends to break.

coastal plain A gently sloping plain at the edge of a continent.

cobble A rock fragment bigger than a pebble and smaller than a boulder.

Coelophysis A meat-eating dinosaur. Its footprints have been found in the Newark Lowlands of New York State.

commercial quantity The amount of a mineral resource needed to make it profitable to use or produce the resource.

commodity A produce of mining or agriculture that can be sold for profit.

compaction The reduction in volume of a sedimentary rock due to the weight of the overlying sediment.

composition The minerals a rock is made of.

compression Pushing together

concrete A building material made of an *aggregate* (for example, gravel or crushed stone) and a cement that holds the aggregate together.

concretion General term for a hard, dense mass made of calcite, pyrite, silica, or other minerals that forms within sediments or sedimentary rock.

conglomerate A coarse-grained sedimentary rock with large rounded pebbles or boulders surrounded by finer grained sediments.

conodont An extinct swimming animal known only from small, tooth-shaped fossils. Conodont fossils are important in determining the age of Paleozoic-age sedimentary rocks.

contact The surface between two different types or ages of rock.

continent-continent collision A convergent margin at which continental crust collides with continental crust.

continental crust Thick and relatively light crust that floats high on the asthenosphere and commonly forms land.

continental glacier A thick ice sheet that covers a large area.

continental ice sheet A large glacier that forms on relatively flat land and flows out from its center.

continental rise The relatively smooth, gently sloping offshore area between the continental slope and the deep ocean floor.

continental shelf The gently sloping (less than 1°) edge of a continent that extends into the ocean as a relatively shallow underwater platform.

continental slope The steeper (3° to 6°) underwater area between the continental shelf and the continental rise.

contour Contour line

contour line A line on a topographic map connecting points of the same elevation.

convection cells A system of convection currents in the earth's mantle where hotter material slowly rises and cooler material sinks.

convection currents The circular motion within a fluid created when warmer, less dense material rises and cooler, more dense material sinks.

convergent margin The boundary between two tectonic plates that are being pushed together.

converging Moving closer together at a convergent margin.

convoluted bedding Very thin crumpled or folded sedimentary layers that occur within a bed that is otherwise undisturbed.

cordierite A blue-colored mineral found in some metamorphic rocks.

core The center part of the earth; it is divided into a solid inner core and a liquid outer core.

corona A ring of minerals that surrounds another mineral or minerals.

correlate To match up two rock units as being of the same age.

correlation chart A diagram that shows the sedimentary rocks that are present in one or more regions, their general arrangement, and their ages. The columns on the chart represent geographic areas; older rocks are shown at the bottom and younger rocks at the top of a column. The legend on Plate 3 of the *Geological Highway Map* is an example of a correlation chart.

Cortlandt Complex A large body of mafic rock found in Westchester County in southeastern New York.

craton The oldest and most stable part of a continent.

crinoid A kind of marine invertebrate that grows fastened by a stem to a firm surface, usually the sea floor. Also called *sea lily*.

crinoid columnals One of many disk-shaped pieces that make up the stem of a crinoid.

crop out To appear at the earth's surface; applies to a geological formation.

cross-bedding Thin, inclined sedimentary layers deposited by wind or water currents (see Figure 7.1).

cross-lamination Cross-bedding.

cross section A drawing of what something would look like if it were sliced through the middle.

crust The thin, solid shell of rock that forms the outer-most layer of the earth.

crustacean A type of arthropod. Most are marine. Some modern examples are lobsters, shrimp, and barnacles.

crustal blocks Blocks of crust

crustal rupture The breaking of the crust into two or more pieces at a particular place.

crustal shortening The making shorter of sections of the earth's crust by folding, thrust faulting, and layer-parallel shortening.

crustal stretching Stretching of the crust.

crystalline Composed of large individual mineral grains; refers to an igneous or metamorphic rock.

crystallize To form crystals; refers to igneous rock solidifying from magma by the formation of mineral crystals.

cyanobacteria Blue-green algae.

cystoid An extinct marine invertebrate that grew fastened by a stem a firm surface, usually the sea floor.

daughter An isotope that is produced when a radioactive isotope (the parent) decays.

décollement A horizontal fault along which much movement has occurred.

deforestation Large-scale cutting down or clearing away of forests.

deformation The folding and faulting of rock by geologic forces.

deformed fossils Fossils whose original shape was changed when the rock that contains them was deformed.

delta A fan-shaped low-lying area formed by sediments deposited at the mouth of a river.

density current An underwater current that contains a large amount of sediment in suspension.

deposit Earth material, such as sediment, laid down by water, ice, or wind.

deposition The process of depositing sediments.

depositional environment The place in which sediment was deposited, such as a lake, an ocean, a stream, a beach, or land.

depositional landform A feature of the earth's surface formed by sediments deposited by a glacier, stream, or wind.

depress To press down or cause to sink.

derrick A tower built over an oil or natural gas well.

dew point The temperature at which water vapor in the air begins to condense into a liquid.

dewatering The removal of water.

diabase A kind of intrusive igneous rock primarily made up of the minerals plagioclase and pyroxene.

diabase feeder Source of magma of diabase composition that reached the earth's surface.

digitize To represent something (for example, data) by number values.

dike A mass of igneous rock formed when molten rock is pushed up into overlying rocks, cutting across the pre-existing layers.

dip To slope downward; or, the amount of downward slope in degrees.

dire wolf A large wolf that lived in Pleistocene North America.

divergent margin The boundary between two tectonic plates that are being pulled apart; new crust is formed at a divergent margin.

dolomite A light-colored mineral (chemical composition $(Ca,Mg)(CO_3)_2$). One of the two carbonate minerals; the other is calcite.

dolomitic Containing the mineral dolomite.

dolostone A carbonate rock primarily made of the mineral dolomite.

domal Dome-shaped

down-dropped Said of the side of a fault that has moved downward.

downfaulted Adjective referring to a crustal block that has moved downward along a high-angle fault.

downwarping A slight bending downwards of a large area of the earth's crust.

downwind In the direction that the wind blows.

drainage The rivers, streams, and lakes of a region.

drainage basin An area in which all of the water that falls as precipitation eventually drains into one main stream.

drainage divide The border of a drainage basin. Streams do not flow across drainage divides.

drainage pattern The map pattern made by streams and rivers flowing across a region.

drape folds Long, low, wave-like folds that form in weak rocks such as shale when the underlying rocks are faulted.

drift Glacial drift.

drill hole test The drilling of a hole in the earth's surface to determine what rocks or sediments lie beneath the surface.

drumlin A long, low-cigar-shaped hill made of glacial till.

ductile deformation The deforming of rocks by flowing instead of breaking, for example by folding. Occurs at high temperatures and pressures far below the earth's surface.

ductile normal fault A normal fault where the rock has deformed by flowing rather than by breaking.

ductile shear zone The area of intensely deformed rocks along which ductile shear has taken place.

dune A hill or ridge of sand piled up by the wind.

earthquake hazard The chance that an earthquake of a given size will happen at a particular place within a certain period of time.

earthquake rise The chance that people will be killed or hurt or property will be damaged by an earthquake.

East Coast Boundary Fault The boundary along the east coast of the United States between highly thinned continental crust and crust that is part continental and part oceanic.

echinoderm An invertebrate sea animal. Echinoderms include modern-day crinoids, starfish, and sea urchins and their ancient relatives.

elevation Height above sea level.

elk A kind of large deer.

elliptical Having the shape of a circle that has been stretched in one direction.

emergent Above sea level

emery A metamorphic rock primarily made of the minerals corundum and magnetite. It is an extremely hard abrasive used for grinding and polishing.

end moraine A moraine that marks the farthest advance of an ice sheet.

engineering geology The study of how rocks and other earth materials are used in and affected by construction.

English system A system of weights and measures based on the foot and the pound.

epicenter The point of the earth's surface directly above the *hypocenter*, or underground source of an earthquake.

erosion The wearing away of rock, sediment, or soil by water, wind, or glacial ice.

erosion surface A land surface shaped by erosion.

erractic A boulder transported from its place of origin by a glacier and left when the ice melts.

escarpment A long, continuous cliff.

esker A long, narrow ridge formed from deposits of a meltwater stream flowing beneath a glacier.

estuary The part of a stream or river affected by ocean tides.

eurypterid A large sea scorpion that lived in the salty seas of the Silurian Period. The eurypterid is the New York State fossil.

evaporate A sedimentary rock that forms in shallow, salty water as the water evaporates. Rock salt, gypsum, and anhydrite are all evaporates.

exotic Adjective referring to a rock or body of rock that has been moved far from its place of origin by one of several possible processes.

exposure A place where rock or sediment can be seen at the earth's surface.

extrusion A volcanic rock.

facies The kinds of rock, sedimentary structures, and fossils in a particular sedimentary rock unit that indicate when the depositional environment was like.

fall zone A narrow area along the boundary between an upland and lowland. Rivers flowing from the upland to the lowland form waterfalls at the fall zone.

Fall Zone Peneplain A flat eroded rock surface that had developed in New York and surrounding areas by the mid-Jurassic and was later covered by younger sediments.

false color Photographic technique used to show part of the electromagnetic spectrum outside the range of human vision. For example, infrared energy is shown as red on the Landsat image on Plate 1 of the *Geological Highway Map*.

fault A break or fracture in rock along which movement occurs or occurred in the past.

fault block A large piece of the earth's crust that is partially separated from the rest of the crust by a fault or faults.

fault breccia Breccia that contains fragments shattered by movement on a fault.

fault zone A fault that consists of a narrow area of many small fractures.

feather edge The very thin edge of a rock or bed where it thins to zero thickness.

feldspar An important group of minerals that are found in almost all crystalline rocks. Feldspars are made of two mineral series: plagioclase and potassium feldspar (orthoclase).

felsic composed of light-colored minerals such as quartz and feldspar.

felt earthquake An earthquake large enough to be felt or noticed by people.

fibrous Made up of long, thin, needle-like crystals.

field An area in which a number of wells produce oil or gas from a single rock formation.

field studies Geologic studies that involve studying a region's rocks, sediments, and geologic features where they naturally occur.

fill Soil or loose rock used to raise the surface of the land.

“five-spot” flood pattern A procedure for producing oil in which four wells on the corners of a square are used to inject water, which forces oil to a fifth well in the center.

fjord A long, narrow bay between cliffs. Formed by glacial erosion.

flagging Flagstone

flagstone Flat stone used for paving.

floodplain A flat area next to a river that tends to flood when the river rises.

flotation separator A device used to purify titanium ore (ilmenite).

fluorite A transparent or translucent mineral.

flute and groove casts Bulges or ridges on the bottom of a sedimentary layer. They form when currents erode a small trough into sediment and then deposit a blanket of sand or silt that fills the groove.

foliation A layer-like structure that forms when a rock is deformed.

foraminifera Microscopic one-celled animals that live in ocean water.

formation A body of rock, usually sedimentary rock, that formed under relatively uniform conditions. Formations are the basic rock unit for geologic mapping;

they may be combined in groups or subdivided into members.

formation contact The boundary between two formations.

fossil hash A sedimentary layer of jumbled and broken animal remains.

fracture A crack or break in rock.

fracture system A group of fractures that have the same orientation.

fracture zone An area where rock has shattered in place but with no motion along the zone.

frequency of recurrence The amount of time that will probably elapse between two geologic events of a certain size, like floods or earthquakes.

Frontenac Arch A narrow zone of Proterozoic rock that connects the Adirondack region and the Grenville Province of southeastern Canada. Its rocks, which resist erosion strongly, form the Thousand Islands in the St. Lawrence River.

gabbro a dark-colored igneous rock made of the minerals plagioclase and pyroxene.

galena A dark gray, dense mineral with chemical composition PbS that is the most important source of lead ore.

garnet A hard, commonly red metamorphic mineral that is used as an abrasive and as gemstones. Garnet is the official mineral of New York State.

garnet gneiss a layered metamorphic rock that contains the mineral garnet.

gas show Evidence that natural gas is present.

gastropod An animal that has a head with eyes and a broad foot. Most gastropods have a single shell. A snail is one example of a gastropod.

geologic cross section A drawing that shows the arrangement of rock as would be seen in a vertical cut through the earth's crust.

geologic map A map that shows the type, distribution, age, and structure of bedrock or surficial deposits in a region.

geologic province A region that has relatively similar bedrock, structure, and geologic history.

geologic time scale An arrangement of geologic events in the order they happened. If the time scale includes actual ages in years, it is called a *quantitative time scale*. If it does not, it is called a *relative time scale*.

geomorphologist A scientist who studies the processes that shape the land surface.

geophysics the branch of earth science that applies physics to the study of geologic structures and processes.

giant beaver An animal of Pleistocene North America, now extinct. It was similar to the modern beaver, but much larger.

glacial debris Glacial drift.

glacial deposit Glacial drift.

glacial drift All rock material transported by a glacier and deposited by the ice or by meltwater.

glacial erosion The erosion accomplished by the moving ice and rock fragments of a glacier and by its meltwater streams.

glacial feature A feature of the landscape created by the action of glaciers.

glacial lake A lake made of the water melting from a glacier.

glacial sediments Glacial drift

glaciation Covering with a glacier; subjecting to glacial action.

glacier A large mass of compacted ice that lasts the entire year.

glauconite A dull green mineral found in sediments and sedimentary rocks deposited in the ocean. The presence of glauconite suggests that the sediments were deposited slowly.

gneiss A coarse-grained metamorphic rock with a strong foliation.

Gondwana A large continent that existed during the Paleozoic Era. It included the modern continents of Africa and South America.

graben A large block of the earth's crust that has dropped down along faults.

grade Metamorphic grade.

grade into To gradually change into. For example, conglomerate that gradually becomes finer and finer upward in an outcrop until it is sandstone is said to *grade into* sandstone.

granite gneiss A layered metamorphic rock having the composition of granite.

graphite A dark gray to black mineral found in metamorphic rocks. It is composed entirely of the element carbon.

graptolite An extinct animal that lived in colonies. Graptolite fossils are important in determining the age of sedimentary rocks deposited during the Paleozoic Era.

gravity anomaly A variation in the strength of gravity at the surface of the earth; it is caused a change in the density of the underlying rock.

graywacke A coarse, usually dark gray, clay-rich sandstone or fine-grained conglomerate.

Grenville Basement The older metamorphic rock that underlies most of New York State.

Grenville Orogeny A mountain-building event that happened about 1.1 billion years ago when another continent collided with proto-North America.

“Grenville Plateau” The high plateau that formed behind the mountains built by the Grenville Orogeny.

Grenville Province A large belt of “basement” rock that was metamorphosed and deformed during the Grenville Orogeny about 1.1 billion years ago.

Grenville supercontinent A supercontinent that began to split apart about 660 million years ago.

ground sloth A large, plant-eating mammal, now extinct, that lived in Pleistocene North America. It was related to today’s tree sloth.

groundwater Water that is found below the surface of the ground.

gypsum An evaporate mineral with the chemical composition $\text{CaSO}_4 \bullet \text{H}_2\text{O}$. It was produced by the evaporation of very salty shallow seas.

habitat The environment or place where a plant or animal normally lives and grows.

hachures Short, straight lines.

halite Common salt. It is an evaporate mineral with the chemical composition NaCl .

hanging valley The valley of a tributary stream left hanging high above the valley of the main stream that was carved out by a glacier.

hardpan A dense layer of glacial till.

headwaters The source of a stream.

heath hen A kind of grouse, now extinct.

Helderberg Escarpment A cliff southwest of Albany where limestones of the Helderberg Group, which resist erosion, lie on top of more easily eroded sandstone and shale.

hematite A reddish brown mineral with chemical composition Fe_2O_3 . It was mined in New York State in the late 19th century for iron ore and was used as a paint pigment.

hematite limestone Limestone that contains the mineral hematite.

“Herkimer Diamonds” Relatively large quartz crystals that formed in cavities in the Little Falls Dolostone.

high-angle fault A fault that is steeper than 45° with respect to the earth’s surface.

highland Elevated or mountains land.

hogback A ridge with steep slopes on both sides.

honeycomb coral A kind of coral that grows in honey-comb-shaped colonies.

horn coral A horn-shaped coral that does not grow in colonies.

hornblende A dark green to black mineral found in igneous and metamorphic rocks.

horst A long, narrow block of the earth's crust that has been pushed up along faults.

hydrated lime A dry white powder made by treating lime with water.

hydraulic fracturing Pumping water under high pressure into a rock formation to cause it to crack and increase the flow of oil and natural gas through it.

hydroelectric power Electricity produced by means of falling water.

hydrogen sulfide A foul smelling, poisonous gas.

hydrogeology The study of the effect of geology on water at the surface of the earth and underground.

hypocenter The underground source of an earthquake; the place where the rock actually breaks.

Iapetus Ocean An ocean formed by the rifting of the Grenville supercontinent. The Iapetus Ocean lay of the east coast of proto-North America.

Ice Age An informal name for the glaciation during the Pleistocene Epoch; also refers to any time of widespread glaciation.

ice cap A small ice sheet

ice dam Floating blocks of ice in a river that pile up and partially block the flow of water.

ice front The leading edge or front of a glacier.

ice margin The edge of a glacier.

ice sheet A continental glacier that covers a large area.

iceberg A large, floating mass of ice that broke from a glacier.

igneous intrusion Igneous rock that was pushed up into cracks in overlying rocks, where it cooled and hardened.

ilmenite A shiny black mineral with the chemical composition FeTiO_3 . It is a source of the metal titanium and the brilliant white pigment titanium dioxide.

impermeable Not allowing liquid or gas to flow through it.

in suspension Mixed with a liquid but not dissolved in it; refers to sediment being carried by water.

inferred Known or discovered by reasoning, instead of direct observation.

infrared Part of the electromagnetic spectrum; it is too low in frequency to be seen by the human eye.

inland sea A shallow sea that lies on top of continental crust.

inner core The solid innermost layer of the earth. We think that it is made primarily of iron.

insoluble Not able to be dissolved.

intensity A description of the effects of an earthquake observed at a particular place on the earth's surface.

intensity map A map showing the locations of the intensity levels observed for a particular earthquake.

interglacial Of or dating from a time of warmer climate between glacial advances.

interlayered Consisting of alternating layers

intrude To push into; refers to magma that is pushed into rock and hardens there as an igneous intrusion.

intrusive Forming an igneous intrusion.

intrusive contact The boundary between an igneous intrusion and the surrounding rock.

invertebrate An animal that does not have a backbone.

island arc A chain of volcanic islands on the overriding plate at the site of an ocean-ocean collision.

isotope One of two or more forms of a chemical element. Each isotope of an element has the same number of protons in its nucleus but differs in the number of neutrons.

J-3 fault scarp The boundary along the east coast of the United States between oceanic crust and crust that is part oceanic and part continental.

joint A crack in rock along which no movement has occurred.

joint system Two groups of joints that intersect.

kame A long, low, steep-sided mound made of layers of sand and gravel deposited by meltwater streams from a glacier.

kame delta A steep, flat-topped hill made of sand and gravel deposited by meltwater streams flowing into a glacial lake.

kame terrace A flat ridge made of layers of sand and gravel deposited by meltwater streams from a glacier.

karst topography A landscape that includes caves, disappearing and reappearing streams, springs, and sinkholes. These features are formed by groundwater dissolving limestone.

kettle A bowl-shaped depression formed in glacial drift when a block of ice buried in the drift melts.

kettle lake A lake in a large, bowl-shaped depression that formed in glacial deposits when blocks of ice mixed in the deposits melted.

kimberlite A dark-colored igneous rock containing the minerals olivine and garnet. Kimberlites are thought to be formed by magma derived from the upper mantle.

Knox Unconformity The unconformity that separates Lower Ordovician rocks from younger Middle Ordovician rocks.

lagoon A large body of salt water near or connected with the ocean.

laminations Very thin layers in sedimentary rock.

landfill A place where solid waste generated by humans is buried.

landform A natural feature of the earth's surface.

landward Toward the land.

latitude Angular distance north or south from the earth's equator.

Laurentide Ice Sheet The ice sheet that invaded New York and the surrounding region during the Pleistocene Epoch.

lava flow Rock that formed when molten rock flowed out onto the surface of the land and hardened there.

layer-parallel shortening Shortening of the earth's crust without folding or faulting.

leucogranite Granite that has a few dark-colored minerals.

leucogranite gneiss A layered metamorphic rock that has the composition of leucogranite.

lignite Brownish-black coal

lime A white substance with the chemical composition CaO. It is used to make mortar and plaster and in agriculture.

lime mud Fine-grained carbonate sediments.

lime mudstone A very fine-grained kind of limestone.

limestone A sedimentary rock was primarily of the mineral calcite.

limestone conglomerate Conglomerate that contains large fragments of limestone.

limonite A group of iron oxide minerals; mined as an iron ore.

limy Containing significant amounts of limestone or the mineral calcite.

lineation Streaks of minerals or other line-like features that form when a rock is deformed or metamorphosed.

lithosphere The outer, more rigid layer of the earth, made up the crust and a layer of rigid mantle.

lobe A large, rounded area of ice projecting from the margin of a continental glacier.

locally Occurring in some places but not in other places.

low-angle fault A fault that makes an angle of less than 45° with a horizontal plane.

lowland Land that is relatively low-lying and level.

mafic Composed of dark-colored minerals, especially those rich in magnesium (Mg) and iron (Fe).

magma Molten rock

magmatic arc A mountain chain formed on the edge of a continent at the site of an ocean-continent collision.

magnesium calcium carbonate The mineral dolomite (chemical composition (Ca, Mg)(CO₃)₂).

magnetic separator A device used to purify ores. It uses magnets to separate magnetic and nonmagnetic minerals.

magnetite A black, strongly magnetic mineral with the chemical composition Fe_3O_4 . It is the most common iron ore found in the Adirondacks and the Hudson Highlands.

magnitude A number describing the size of an earthquake; it is calculated from the amplitude of the seismic waves as recorded by seismographs.

mammoth A hairy, very large, elephant-like animal of the Pleistocene Epoch. Mammoths had teeth with broad grinding surfaces identical to those of living elephants. They are now extinct.

magerite An igneous rock similar in composition to charnockite but containing less quartz.

Manhattan Prong The region underlain by metamorphic rocks in the New York City-Westchester County area.

mantle A thick layer of dense rock that lies about the outer core and below the crust of the earth.

map unit A single rock unit or a group of related rock units shown by a color or pattern on a geologic map.

marble A metamorphic rock composed of the minerals calcite or dolomite. It is formed by the metamorphism of limestone.

margin The edge of a continent, ocean basin, or other feature of the earth's surface.

marine Of or relating to the sea.

marl A soft, loose sediment composed of clay and calcium carbonate.

marshland An area of soft, wet land

mastodont An extinct, elephant-like, hairy animal of the Pleistocene Epoch. It was very similar to the mammoth, but had teeth with high, cone-like bumps on the upper surface that served to chop twigs and branches. (Formerly spelled *mastodon*).

matrix In conglomerate rocks, the fine-grained material in which the larger fragments are embedded.

maximum intensity The highest intensity level observed during an earthquake. It is used as an indirect measure of the size of an earthquake.

meandering stream A stream that flows along an intricate winding course.

mechanical weathering The mechanical breakdown of rock into small pieces without chemical change.

megaconglomerate A conglomerate that contains very large boulders.

meltwater Water melting from glacial ice.

metagabbro Gabbro that has been metamorphosed.

metal castings Metal objects produced by pouring hot liquid metal into a mold and allowing it to cool and harden.

metamorphic grade A description of the temperature and pressure conditions during metamorphism. For example, high metamorphic grade refers to rock metamorphosed at high temperatures and pressures.'

metanorthosite Metamorphic rock formed from the igneous rock anorthosite.

metaplutonic rock Metamorphic rock that has been formed by metamorphism of *plutonic rock*—igneous rock that hardened underground.

metasedimentary rock Metamorphic rock that has been formed by metamorphism of sedimentary rock.

metatonalite Tonalite that has been metamorphosed.

metavolcanic rock Metamorphic rock that has been formed by metamorphism of *volcanic rock*—igneous rock that hardened at the earth's surface.

metric system A system of weights and measured based on the meter and the kilogram.

microcontinent A small continent

mid-oceanic ridge A huge underwater mountain chain that forms at the divergent margin in the middle of a widening ocean.

migmatite A layered rock that is part igneous and part metamorphic; formed at high temperatures and pressures deep in the earth's crust.

mineral assemblage The collection of minerals that makes up a specific rock.

mineral fuels Coal, oil, and natural gas. New York State produces oil and natural gas.

mineral resources Mineral deposits that are economically valuable.

Modified Mercalli intensity scale The intensity scale used today in the United States to describe earthquakes,

molding sand Sand that contains clay and can be molded into complex shapes.

mollusk An invertebrate animal with a nonsegmented body and a hard outer shell. Snails and clams are examples of mollusks.

monocline A fold in horizontal or gently inclined rock with one steep limb.

montmorillonite A kind of clay formed from volcanic ash; it expands greatly when wet.

moose-elk A large deer, now extinct, that lived in Pleistocene North America.

moraine A pile of unsorted glacial drift deposited along the margin of a glacier.

mottled Marked with spots or blotches of different colors.

mountain glacier A relatively small glacier that forms in the mountains and frequently flows down a valley there.

mud cracks Cracks that form in clay, silt, or mud as it dries. The cracks form a pattern of irregular polygons on bedding surfaces.

mudstone A sedimentary rock made from mud. It does not have the thin layering found in shale.

mulch A substance spread on the ground to enrich the soil.

multispectral scanner A device used in satellites to take pictures of the earth from space without the use of film.

musk ox A large shaggy wild ox that lives in cold climates.

mylonite The intensely deformed rock formed in a ductile shear zone.

natural cement A kind of cement that is produced by burning and then grinding a special kind of limestone that contains just the necessary amount of clay materials. The ground rock, mixed with water, will dry into a hard mass.

natural gas A flammable gas found in the earth's crust.

naturalist A scientist who studies natural history.

nautiloid A shelled cephalopod. These squid-like animals existed from the Cambrian Period to the present.

nearshore In shallow water, close to the shoreline.

neutron An uncharged particle that makes up part of the nucleus of an atom.

Newark Basin A rift basin formed during opening of the Atlantic Ocean in which the rocks of the Newark Group were deposited.

Newark Group The sedimentary rocks of Triassic age that make up most of the bedrock of the Newark Lowlands.

normal fault A steep fault along which the block of rock above the fault moves down relative to the other block.

Northwest Lowlands The northwestern part of the Adirondack region; it is divided from the Central Highlands by the Carthage-Colton Mylonite Zone.

nucleus The central part of an atom; made up of protons and usually neutrons.

ocean basin A low area made from oceanic crust and filled with sea water.

ocean-continental collision A convergent margin at which oceanic crust collides with continental crust. The dense oceanic crust is subducted beneath the lighter continental crust.

ocean-ocean collision A convergent margin at which oceanic crust collides with continental crust.

oceanic crust Thin and relatively dense crust that floats low on the asthenosphere and commonly forms ocean basins.

offshore Distant from the shore.

oil A naturally occurring thick liquid found in the earth's crust. It is refined into gasoline and other products.

olenellid A kind of spike-tailed trilobite with many body segments that lived during the Early Cambrian.

olivine A green-colored mineral found in igneous rocks.

ore body A mass of ore that is economically enough to mine.

organic materials Organic matter.

organic matter Carbon-rich material derived from living organisms.

orientation The position of an object in space.

oriented Arranged in space.

orogeny A mountain-building event caused by the collision of two or more tectonic plates.

ostracode A small, bean-shaped crustacean.

outcrop Bedrock that is exposed at the earth's surface.

outcrop band Outcrop belt.

outcrop belt An area in which outcrops of a single rock unit or of a group of related rock units are found.

outer core The layer of molten iron that lies between the mantle and the inner core of the earth.

outlet The place where a stream flows out of a lake.

outwash Layers of sand, gravel, and other debris deposited by glacial meltwater streams.

outwash plain A broad, flat sheet of sediment deposited by meltwater streams.

overlie To lie over or on top of.

overriding plate At a convergent margin, the tectonic plate that remains at the surface while the other plate is subducted beneath it.

overthrust A low-angle fault in which movement of several kilometers of more has taken place.

oxygenated Containing dissolved oxygen.

P wave A seismic wave that moved through rock by alternately compressing and expanding it in the direction of travel. P waves are faster than S waves; they can travel through solids, liquids, and gases.

packer In hydraulic fracturing, a piece of rubber that is expanded against the wall of a drill hole to keep the water pressure high enough to fracture the rock.

paleogeography The physical geography of past geologic ages.

Palisades An escarpment along the west bank of the Hudson River made of diabase that solidified in Early Jurassic time. It got its name from the fact that it resembles a colonial log fence, or *palisade*. The mass of diabase that forms the cliff is called the *Palisades Sill*.

Pangea A supercontinent that formed as a result of many orogenies, including the Taconic, Acadian, and Alleghanian. Pangea broke apart in a worldwide rifting event that began about 220 million years ago.

parent A radioactive isotope that decays into another isotope (the daughter) by emitting particles, or energy, or both.

parent material Weather rock or sediment that later becomes soil.

passive margin A continental edge that is tectonically quiet.

“pearly layer” A layer of shale that is crowded with broken brachiopod shells.

peat The carbon-rich remains of swamp and bog plants that were submerged and chemically altered.

peat bog A low-lying wet area where peat is formed.

peccary A kind of wild pig.

pegmatite An extremely coarse-grained igneous rock.

pelecypod A bottom-dwelling bivalve mollusk. Clams, oysters, and mussels are examples of pelecypods.

pelmatozoan An echinoderm that lives attached to a solid part of the sea floor.

pencil cleavage A kind of cleavage that causes rock to break, when weathered, into long, narrow pieces that look like pencils.

perforated Having a hole or holes.

permeable Allowing liquid or gas to flow through it.

permeability The ability of water to flow through a particular material.

petroleum Oil and natural gas.

phosphatic Containing or made of phosphate minerals.

phosphors Substances that emit light when excited by radiation.

phyllite A metamorphic rock intermediate in metamorphic grade between a slate and a schist. The foliation gives the rock a silky sheen.

physiographic diagram A drawing of the physical features of part of the earth's surface.

physiographic province A region in which the shape of the land's surface is fairly constant, and is different from that of surrounding regions.

physiographic map A map that shows the shape of the earth's surface.

physiography The physical features of the earth's surface.

piedmont Land at the base of a mountain or mountain range.

pillow lava A lava flow that formed in tubes underwater. The lava tubes look like a pile of pillows.

pinchout The place at which a body of rock thins until it disappears.

pine-barren vegetation Plants that are adapted to grow on well drained sandy soils.

pinnacle reef A column of carbonate rock built by corals and other marine organisms in shallow water.

pitch pine A kind of pine tree.

placoderm An extinct kind of armor-skinned fish; placoderm fossils are found in rocks from Late Silurian and Devonian time.

plagioclase One of the most important rock-forming minerals; part of the feldspar group of minerals.

planar Flat or level; lying in a plane

plastic Adjective referring to deformation that permanently changes the shape of an object without breaking it.

plasticity How materials deform under pressure without breaking.

plate A rigid segment of the earth's lithosphere. Today, there are about eight large and several smaller plates.

plate tectonics The theory that the outer layer of the earth is divided into rigid plates, which move and interact along their edges. The theory of plate tectonics is very important in modern geology.

platform The part of a continent covered by flat-lying sedimentary rocks.

plunge pool A round depression carved in the rock at the foot of a waterfall by the force of the falling water.

plutonic rock Igneous rock that formed when magma cooled and hardened below the earth's surface.

pollen Tiny spores produced by a plant.

poorly sorted Having sediments of all different sizes deposited together.

pore spaces The small unfilled spaces between grains in rock or sediment.

porosity The percentage of empty space in a certain volume of material.

porous Containing a large amount of pore space between grains.

portland cement A kind of cement manufactured by heating limestone and shale together in a kiln.

postglacial Of or dating from a time after retreat of the glaciers from a region.

potassium feldspar An important rock-forming mineral of the feldspar groups.

pothole A circular hole formed in bedrock of a river bed by abrasion of pebbles and cobbles in a strong current.

precipitation Rain, snow, sleet, hail or mist.

preglacial Of or dating from the time before the glacial advance of the Pleistocene Epoch.

pressure solution A process in which rock is deformed by compression, which raises the pressure of the water in the rock's pore spaces. The water dissolved the silica in the rock and leaves behind seams of insoluble material.

primary recovery Producing oil by drilling a new well.

proto-Africa The continent that was later to become Africa. It collided with proto-North America along a transform margin during the Alleghanian Orogeny.

proto-North America The continent that was later to become North America.

proton A positively charged particle that makes up part of the nucleus of an atom.

ptarmigan A kind of grouse that lives in cold climates.

pterosaur An extinct flying reptile.

pyrite A yellow, metallic-looking iron sulfide mineral (chemical composition FeS_2). Larger pieces are known as "fool's gold."

pyroxene A group of dark-colored minerals in igneous and metamorphic rocks.

quadrangle A rectangular section of land represented by a topographic map (or by some other kind of systematic mapping).

quantitative time scale a time scale that gives the age in years of events or objects.

quarry A large excavation to obtain stone, usually for building.

quartz A common rock-forming mineral (chemical composition SiO_2).

quartzite A metamorphic rock formed by metamorphism of sandstone or chert.

Queenston Delta A thick wedge of sedimentary rock formed in eastern proto-North America during Late Ordovician time. The sediments of the Queenston Delta were eroded from the mountains build during the Taconian Orogeny.

quicktime Lime

radial drainage The pattern of streams flowing out in all directions from a central high area like spokes of a wheel.

radioactive decay The process by which an unstable isotope (the parent) changes into another isotope (the daughter) by emitting particles, energy, or both.

radioactivity The instability of some isotopes, so that they can change into other isotopes by radioactive decay.

radiocarbon dating Radiometric dating using carbon-14.

radiometric dating A method for measuring the age of objects in years by using the decay rate of radioactive elements.

Ramapo Fault A fault in southeastern New York and northern New Jersey that separates the western and central areas of the Hudson Highlands.

Reading Prong The geologic province of metamorphic rocks that extends from Pennsylvania to Connecticut.

rebound Upward movement of the earth's crust due to removal of the weight of glacial ice sheets by melting or of overlying rock by erosion.

recrystallize Form new crystals in a rock during metamorphism.

reef carbonates Deposits of carbonate sediments made by reef-building animals, such as corals.

reference section A section of rocks that serve as a time line for a certain part of geologic history. Geologists try to match rock units from other areas to the reference section to determine where those units fit in geologic history.

relative time scale A time scale that ranks events or objects from older to younger, but doesn't give their age in years.

release joints Joints that form in rock that was once deeply buried and under great pressure. As erosion removes the overlying rock, the pressure is decreased on the buried rock and it expands, forming joints.

relief The local difference in elevation between the lowest and the highest points of the landscape.

reservoir An artificial lake where water is collected and kept for use.

residual mountains Mountains that remain after the erosion of a high plateau. The Catskill Mountains are an example.

resistant Not easily eroded; applies to rock or other material.

resolution The ability to tell apart objects that are closed together.

reverse fault A steep fault along which one block of rock has moved up and over the lower block.

rhyolite lava A kind of igneous rock that has the same chemical composition as granite but cooled at the earth's surface.

Richter magnitude scale The most commonly used magnitude scale. It was devised in the 1930s to measure California earthquakes.

rift basin A rift valley that has filled with water to become a sea.

rift valley A long, narrow valley that forms at the place where a continent is rifting,

rifting The process of splitting one lithospheric plate into two or more pieces of plate tectonic forces.

rigid mantle The strong outer layer of the mantle that together with the crust makes up the lithosphere.

riprap A layer of large pieces of rock used to prevent erosion by waves or currents.

road cut A place where part of a hillside has been cut away to build a road, exposing the rocks.

rocdrumlin Rock drumlin

roche moutonnée A small, rounded streamlined knob carved in bedrock by a glacier.

rock debris Any loose material produced by the weathering of bedrock.

rock drumlin A drumlin with a bedrock core.

rock flour Rock that has been ground into clay and silt-sized particles by a glacier.

rock record The bedrock of a region. It contains clues that allow geologists to reconstruct the geologic history of the area; therefore, we say it "records" that history.

rock unit A body of rock that can be treated as a unit because all the rock in it shares the same characteristics (for example, color, structure, mineral composition, and grain size).

root traces Marks left in sediment by the roots of plants.

runoff Water flowing over the surface of the ground.

rusty The color of rust; caused by the weathering of iron-bearing minerals such as pyrite.

S wave A seismic wave that vibrates the rock at right angles to the direction the wave is traveling. S waves are slower than P waves; they can travel only through solids.

Salamanca Re-entrant A small area in southwestern New York that remained ice-free during the Wisconsin Stage.

salinity The amount of dissolved salts in sea water.

San Andreas A large transform fault system in California that separates the Pacific plate from the North American plate.

sandstone A sedimentary rock made up of round quartz grains cemented together.

saprolite The soft, earthy residue left behind when rocks are chemically weathered.

scavenger An animal that feeds on dead animals.

scour To clear, dig, or remove by a powerful current of water or by glacial ice.

scour and fill Preserved water channels that were later filled in with sediment; commonly shows cross-bedding.

sea ice Frozen sea water.

sea lily Crinoid.

seaward In the direction of the sea.

secondary cleavage The tendency of a deformed or metamorphic rock, such as slate, to split in a direction different from the original sedimentary layers.

secondary recovery Producing the remaining oil from an oil field by waterflooding after most of the oil in the field has been pumped out.

section The series of rock units found in a given region.

sediment Rock material transported and deposited by water, wind, or glaciers.

sedimentary structure Any feature in sediment or sedimentary rock formed at the time of deposition. Sedimentary structures include bedding, cross-bedding, ripple marks, mud cracks, and flute casts.

seep A place where oil naturally leaks out onto the ground surface.

seismic waves Vibrations that travel through the earth, whether generated by natural or artificial means.

seismograph A device for detecting and recording seismic waves.

seismology The study of earthquakes and the interior structure of the earth by means of seismic waves.

septarian nodule A large concretion that is broken into irregular blocks by cracks that are filled or partly filled with mineral cracks.

sequence A series of rock units.

serpentinite Rock made almost entirely of the mineral serpentine. Some serpentinite is thought to be preserved pieces of ancient oceanic crust.

serpentinization The process in which magmatic and ultramafic minerals are changed into the mineral serpentine.

shale A fine-grained sedimentary rock composed of silt- and clay-size particles. It breaks easily along the bedding plane.

shale basin A sea basin in which shale is deposited.

shear Deformation caused by two objects moving sideways past one another.

shelf Continental shelf.

shelf valley A channel cut in the continental shelf by a river that flowed across the shelf when sea level was lower.

shingle beach A narrow, steep-sided beach made of very coarse sediments.

shore zone The area along the shoreline affected by waves or tides.

shoreward In the direction of the shore.

short-fiber asbestos Minerals of the asbestos group that readily separate into flexible fibers.

siderite A yellow-brown mineral with the chemical composition FeCO_3 ; used for iron ore.

silica A substance made of silicon and oxygen (chemical composition SiO_2). It is present in many minerals, sediments, and rocks, including quartz and chert.

silicate Any of the minerals built around a structure of one silicon atom and four oxygen atoms. The earth's crust is mostly made up of silicate minerals.

sill A broad, flat sheet of igneous rock that lies parallel to the layers of the surrounding rock.

sillimanite A mineral made up of long, needle-shaped crystals; it is found in some metamorphic rocks that formed at high temperatures.

siltstone A sedimentary rock made up of silt-sized particles.

slope Continental slope.

slump A sudden downward slide of land.

soil Surface layer of the land where plants can grow.

soluble Able to be dissolved.

solution the process of dissolving something.

sorted Deposited with the same size particles together.

spaced cleavage A kind of cleavage in which the cleavage forms at regular intervals in the rock.

spectral band A part of the electromagnetic spectrum.

spahalerite A mineral with chemical composition. ZnS that is a source of zinc.

spit A tongue of land that extends from the shore into a body of water.

stalked echinoderm An echinoderm that grows attached to the solid sea bottom of a stalk.

stippled Dotted or speckled.

strain The deformation of rock as the result of stress applied to it.

strata Layers of sedimentary rock or sediment. *Strata* is the plural of *stratum*.

stratified drift Glacial drift deposited in layers by a meltwater stream or in a glacial lake.

stratigraphic trap An underground layer of permeable sedimentary rock surrounded by impermeable rock; it holds oil or natural gas. This kind of trap is formed by the way sediments are deposited.

stratigraphic unit An interval of sedimentary rocks regarded by geologists as a natural, easily recognizable unit; we recognize a stratigraphic unit based on rock types or fossils.

stratigraphically upward In undeformed sedimentary rock, moving from lower, older rock to higher, younger rock.

stratigraphy The description, classification, and interpretation of sedimentary rocks and the environments in which they were deposited.

stress Force applied per unit of area. Rock deformation is caused by stress applied to the body or rock.

striation A scratch left on a rock surface by the passage of a glacier.

stripper well An oil well that produced less than 10 barrels of oil per day.

stromatolite A layer mound-like structure built by blue-green algae living in shallow, well-lit water.

stromatoporoid An extinct kind of colonial coral-like sponge that built reefs.

structural history The folding and faulting that have affected a body of rock and the events that caused them.

structural trap An underground pocket of permeable sedimentary rock that holds oil or natural gas surrounded by impermeable rock. This kind of trap is formed by folding or faulting of the rock.

structural unit A unit of rocks that have undergone a similar deformation history.

structure Large or small feature in a body of deformed rock that tell us something about its history. Examples of structures are folds, faults, cleavage, and foliation.

stylolite A irregular surface that runs through a rock. It is marked by insoluble material left behind when silica is dissolved by pressure solution.

subaerial Exposed to the open air.

subarctic A cold, dry climate found in areas near the arctic circle.

subduction The process of one lithospheric plate sinking beneath another at a convergent margin.

subduction zone A long, narrow belt where subduction is occurring.

submarine sediments Sediments deposited in the ocean.

submergence Flooding or placing of something underwater.

subordinate Adjective referring to a minor amount of something, such as a mineral.

subsurface Below the surface of the earth.

subtropical A hot, humid climate found in areas near the tropics.

suite Collection or arrangement; applied to a group of rock units.

sulfide A mineral that contains the element sulfur, such as pyrite or galena.

sun-synchronous Adjective referring to a satellite orbit in which the sun is at the same position with each pass of the satellite.

supercontinent A single continent that contains most of all of the earth's continental crust.

Superior Province Area of very old (2.7 billion years) "basement" rocks; located to the west of the Grenville Province.

superposition The idea that, in an undisturbed sequence of layered rock, the upper layers are younger than the lower ones.

surface water Water found in streams, river, and lakes.

surficial deposits Loose sediments lying at the surface of the earth, above the bedrock.

surficial geology The loose deposits, such as soil and glacial deposits, that lie on the surface of the earth; also, the study of such deposits.

suture The line along which two continents have been attached together.

suture zone The area in which a suture is found.

swamp Low-lying, wet land, sometimes partially flooded.

syncline A fold in rock that is concave up.

synclinorium A large syncline.

tabular Adjective referring to shapes that are much longer and wider than they are thick.

tabulate coral A kind of coral.

Taconian Orogeny A mountain-building event that happened about 450 million years ago, when a volcanic island arc collided with proto-North America.

Taconic Mountains Highlands in eastern New York and western New England. The mountains built by the Taconian Orogeny are called *ancient* or *ancestral Taconic Mountains*.

Taconic Sequence The sedimentary rocks in eastern New York State and western New England originally deposited in deep water. They were later stacked together by the collision of an island arc with proto-North America during the Taconian Orogeny.

Taconic Unconformity The unconformity that lies between the Middle Ordovician rocks and the younger Silurian and Devonian rocks on top of them.

talc A very soft, white to light green, flaky mineral. The "talc" mined in New York State actually contains less than 50% of the mineral talc.

tectonic map A map that shows the kinds and ages of deformation of the rocks in a region.

tectonic province A region that has undergone a similar tectonic history.

tectonism Plate tectonic activity or motion.

temperate Moderate or mild; refers to climate.

tentaculitid An extinct marine invertebrate animal characterized by a small, cone-shaped shell.

Terminal Moraine The end moraine left by the Laurentide Ice Sheet during the Wisconsinan Stage.

terrace A relatively flat surface, something like a step, built onto the side of a slope.

terrane A large part of the earth's crust that has undergone a similar tectonic history.

terrain The physical features of an area of land.

terrestrial sedimentary rock Sedimentary rock made up of sediments deposited on land.

tertiary recovery Producing oil from an oil field after pumping and waterflooding have been used.

thrust fault A nearly horizontal fault. The sheet of rock above the fault is pushed up and over the rock underneath.

thrust sheet A body of rock transported as a single mass along a thrust fault.

thrust slice A body of rock bounded above and below by thrust fault.

Tibetan Plateau An extensive high plateau north of the Himalayan Mountains. Both the mountains and the plateau were built by the collision between India and Asia, which started 40 million years ago and is still going on today.

tidal flat The flat-lying area along the seashore that is covered by water at high tide and uncovered at low tide.

tidal zone The area of a shoreline between high and low tide.

tight sands Impermeable sandstone

till An unsorted mixture of clay, sand, gravel, and boulders deposited directly by a glacier.

time-correlation The matching of rock units of the same age from different area.

time marker A feature, such as a fossil, in rock that helps show where the rock belongs in geologic time.

titanium A strong, lightweight metal used in the aerospace industry. The mineral ilmenite is the major source of titanium.

titanium dioxide A brilliant white pigment used in paints. It is made from the mineral ilmenite (titanium ore).

tonalite An igneous rock composed primarily of the minerals plagioclase and quartz.

tonalitic gneiss A layered metamorphic rock that has the composition of tonalite.

topographic map A map with contour lines showing the shape and elevation of the land surface.

topographic relief Relief

topography The shape and height of the earth's surface.

trace fossil A mark, like a burrow or a track, left by an animal or plant root in sediment and preserved when the sediment becomes rock.

transform margin The boundary between two tectonic plates that are moving sideways past each other.

transform movement Sideways movement.

trend The compass direction in which a rock body or other geologic feature runs.

tributary A stream that flows into a larger stream or lake.

trilobite An extinct, Paleozoic, sea-living arthropod.

tripocal climate A hot, humid climate found in the tropics.

trough A long, narrow stream channel; a long, shallow depression in the sea floor.

tube coral A kind of coral .

tundra A treeless plain found in arctic and subarctic regions.

tundra climate A very cold climate.

turbidite A sedimentary rock formed from sediments deposited by a turbidity current.

turbidity current An underwater current that carries a large load of sediment in suspension.

ultramafic Adjective referring to a dark-colored igneous rock composed chiefly of mafic minerals.

unconformity A surface in a rock sequence where there is a gap in the geologic record. An unconformity forms when rock is eroded and new rocks are deposited on the eroded surface.

unconsolidated Loose or uncemented.

underground storage The practice of storing natural gas produced elsewhere in underground sedimentary rock layers. These layers once contained natural gas, but the gas has already been pumped out.

underlie To lie under or be located underneath.

undulatory Having a wavy surface or structure.

unit Rock unit.

unsorted Deposited with different size particles together.

upland An area of land relatively high in elevation.

uplift The upward movement of part of the earth's surface. Also refers to a region that has been uplifted.

U-shaped valley A steep-sided valley that has been carved out by a glacier. The cross section of the valley is shaped like the letter U.

valley fill Sediments left behind in a valley by a stream or a retreating glacier.

Valley Heads Moraine A moraine built by the Laurentide Ice Sheet across central New York. It dammed the southern ends of the Finger Lakes and formed an east-west drainage divide.

variegated Having varied colors.

vener stone A thin ornamental surface of cut stone.

vertebrate An animal that has a backbone.

visible spectrum The part of the electromagnetic spectrum that is visible to the human eye.

volcanic rock Rock that is formed when molten rock flows out onto the surface of the earth and hardens there.

volcanism Volcanic activity

V-shaped valley A valley cut by a stream. The cross-section of the valley is shaped like the letter *V*.

water gap A deep, narrow notch cut through a ridge by a river.

water jet A thin stream of high-pressure water used for cutting.

water table The top of the underground layer that is saturated by groundwater.

waterflooding The practice of injecting water into a depleted oil field. The water pressure forces oil that remains in the ground to a selected well.

weathering The physical and/or chemical decomposition of earth materials at or near the earth's surface.

well sorted Having all the sediment particles of approximately the same size deposited together.

wildcat well An oil and gas well drilled in a region that had not previously produced oil or natural gas.

winnowing Washing away of the fine particles of sediment leaving the coarser grains behind.

Wisconsinan Stage The last part of the Pleistocene Epoch, during which New York's last episode of glaciation occurred.

wollastonite A white, fibrous mineral with the chemical composition CaSiO_3 . It is used in ceramics and in paints.

Woodfordian Substage The last part of the Wisconsinan Stage.

wooly mammoth A hairy, very large, elephant-like animal of the Pleistocene Epoch. It is now extinct.