



# **The rocks, rivers of the changing earth by Herman Schneider and Nina Schneider.**

[s.l.]: [s.n.], [s.d.]

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The Rocks, Rivers of

The Changing Earth

by Herman Schneider and Nina Schneider

The leaf was once the stone, the cloud was once the sea. The earth tells its story over and over again - the leaf will become a stone, the cloud will become the sea again.

Right now there are coral animals bldg. land that will some day rise far above the sea.

Every river begins in the clouds. No matter what kind of river it is, it begins as falling rain.

The soil drinks up water like a sponge. That is why rivers keep on flowing even when it isn't raining.

1. A rock is made of minerals constantly on the move and changing from heat, cold and pressure.

A river as it flows along picks up sand, oil, pebbles and minerals.

Everything made of rock or sand or asphalt is made of minerals. Even salt is a mineral. Minerals get dissolved out of rocks by rain. As it seeps thru the ground, some of this water and mineral material is drawn up into the roots of plants, but most of it goes on its long journey to the sea.

Hard water is the water that contains lots of minerals.

If water passes thru ground containing sulphur, it may have the smell and taste of bad eggs.

Sometimes minerals pile onto each other while the water passes on, and so stalactites. They were once part of other rocks. Flowing water dissolved the faraway rocks, bit by bit, carried them along in the form of dissolved minerals, and then built them up again, drop by drop, into the strange and beautiful rocks in the cave. This is one of the strangest of the earth's ways - that rock should dissolve into water and then flow on, perhaps to turn into rock again, or perhaps to flow in a river that ends in the sea.

Ocean water is salty. River water, containing tiny amounts of salt, as well as many other minerals, keeps pouring into the ocean all the time. The sun shines on the ocean and heats the water. Some of the water is evaporated by the heat of the sun but the salt always remains behind. The minerals steadily washing out of the land into the sea. Water evaporated goes into a cloud and comes back to earth as rain.

chilled by the cool wind

 The water cycle. The water you used to wash your face this morning is millions of years old.

Flowing water can wear away mountains and can cut thru and thereby make mountains (Grand Canyon). There was a time thousands of years ago when the earth was much colder than now. Glaciers covered Canada, a large part of the US and most of Europe. They became so wide and deep that they became one vast sheet of ice which was over ten thousand ft. thick. Sometimes now you see a huge boulder different in color or grain from other stone nearby - the melting glacier left it there. Most of the rocks scattered thru the fields of New England were brought down by glaciers that melted and left them behind. A glacier built Long Island. The force of winter, water, sunlight - mountains are being worn down.

Grayish-blue plants called lichens grow on rocks. They ooze out special juices that make the rock soft and crumbly.

Then rain water is able to dissolve the minerals in the rock so that the lichens can get them.

2. Soil consists of plant material and rock material rotted into it.

3. Rock is always changing from sun's heat and freezing water. But the journey of the rock is not ended. It is never ended. In every tiny part of any living thing are materials that once were rock that turned to soil. These minerals are drawn out of the soil by plant roots and the plant used them to build leaves, stems, flowers and fruits. Plant eaten by animal. And still the journey of the rock is not ended, for nothing in the world remains unchanged forever.

and rock  
and plants  
& animals

A rock is not always a rock; a rose is not a rose forever. The fresh apple that you may eat today is as old as the hills. And when you eat it, a tiny bit of those hills becomes part of you. Before it became part of you it may have been in the autumn leaves that fell and crumbled into the soil near the apple tree. Years before it may have been in the shell of a robin's egg. And once it may have been part of a stalactite in some dark underground cavern. Perhaps for a short while it sailed high over the earth in a butterfly's wing. Long ago, it may have been in a kernel of corn planted by an Indian.

1. Waves turn pebbles into sand. "Every wave changes the world."

The dissolved minerals brought in by the river water helped change the sediment. Acted as a kind of cement. Working together for millions of years, the cement-like minerals and the squeezing caused the layers of sediment, sand, shells, skeletons and mud to harden into layers of rock. And because the rock was made out of sediment, it is called Sedimentary rock.

If you see rock arranged in layers then you know it is sedimentary rock and that the land you are standing on was once at the bottom of the sea. i.e. slate was formed millions of years ago at the bottom of lakes and seas. Before it became hard slate it was a soft sedimentary rock called shale.

In the same way the mud that you stir up when you go swimming in a brook may become the blackboard cut out of a mountain for use in a schoolroom a million years from now.

The chalk cliffs of Dover are made of billions of tiny sea-animal skeletons, packed closely together.

Deep inside the earth the great heat melts the rock and metals. Such melted rock is called magma. It oozes up moving very slowly, wherever it can. Where magma moves it shifts the crust of the earth that is above it.

Rich, fertile fields like those of Idaho, were once hot lava layers. As magma pushed up it brought valuable gases and liquids and minerals. These cooled into igneous rock. Much of the world's land was raised from under the sea by magma - by magma pouring out of volcanoes. Some volcanoes produced precious jewels i.e. diamonds. It left deposits of gold and silver.

A smooth-grained rock is quick-cooled. Igneous rock may be of practically any color. They may have particles of quartz-like glass or gleaming mica-like bits of mirror. May be colored with flecks of gold, silver, rainbow opals, or grains of cinder-black.

Obsidian cooled very quickly - no time for grains or crystals to

(slow-cooled)

form. Like shiny glass. Usually black but sometimes dark red or green.

~~Earthquakes~~ - when the earth shifts suddenly into a new position it settles down with a crash. They shake the mountains and set rocks in a new position. They can change the course of rivers.

~~Earthquake~~ Metamorphic rock - magma being very hot changes the rock. The heated rock often becomes hard and tough and has a glassy look. Marble. Marble began as soft limestone and then heated by magma - changed into many colors depending on the color of the sediment out of which originally formed. Black, pink, yellow and red seashells give marble its varied and lovely colors.

Changing Earth - a raindrop is itself for only a moment. The pebble has traveled far and wide. Long ago it was a drop of magma, molten rock that poured out from deep inside the earth. Perhaps when the magma cooled it formed part of a mountain that was later worn down and carried away by a rushing stream. Or the pebble may have been carried thousands of miles by a slowly moving glacier that finally melted and left it there for you to pick up. It has traveled to many places and has been part of many things.

*Earth iron*  
You are part of the earth's story. In your blood is iron from plants that drew it out of the soil. Your teeth and bones were once coral of the sea and tiny, beautiful sea animals. The water you drink has been in clouds high over the highest mountains of Asia and in lovely, misty waterfalls of Africa. The air you breathe has blown and swirled thru places of the earth that no one has ever seen. Every bit of you is a bit of the earth, and has been on many strange and wonderful journeys over countless millions of years.