

November 3rd, 1952
Wailuku, Maui, T.H.

Andy and Jeff:

In a separate package I am sending two special rocks. I picked them up where I work. They are quite common here but cannot be found anywhere near Wheaton or anywhere in Illinois. I will tell you a story about them because they came from deep down inside the earth.

Below the surface of the ground are more and more rocks. The deeper one goes the hotter these rocks become. Now you know how butter melts when it gets warm or is allowed to stand in the sunshine. Well, the same thing happens to the rocks very deep down. They are so hot that they are melted just like butter. In Illinois no one would guess that this was so because no one ever saw the rocks very deep down under the ground. However out here there is a large hole in the ground which goes a long way down until it gets to the very hot rocks deep under the surface of the earth.

Sometimes this hole opens up and lets the very hot rocks from deep down come up to the surface of the ground and run out. The rock is so hot that it flows just like melted butter. When it is like this no one would ever think it to be rock. However in a short time it cools and solidifies just like the melted butter will if you put it in the refrigerator. After it has cooled and become hard this rock from deep down under the surface of the earth is called LAVA. This special lava rock comes from a very long way down. The place I picked the rocks up is about 2 miles above the surface of the ocean. The ocean is over 3 miles deep. The lava probably comes from 4 or 5 miles under the bottom of the ocean. Thus this hole in the ground is at least 9 or 10 miles deep. This is as far as from your house to where your father works in Geneva.

The two rocks I am sending are made of the same material but

they look and feel different because different things happened to them. When the lava comes out of the hole in the ground it may just flow out smoothly and form into puddles. Or the lava may bubble out more rapidly and tumble down hill. Now there is a lot of gas dissolved in the liquid rock. This gas is much like the gas in Coca Cola. If the liquid rock forms into puddles it remains hot for quite a long time and the gas has a chance to escape much like a glass of Coca Cola standing on the table over night. In the morning it will look the same but will not taste the same because all the gas has evaporated over night. When the rock cools like this it is very hard and heavy. The Hawaiians call it PAHOEHOE (all the vowels are long, pah-ho-ay-ho-ay). If the liquid rock bubbles and tumbles over itself and other rocks, then it cools much faster and the gas doesn't have time to escape before the rock gets hard. Consequently there are a lot of small holes in the rock and it is very rough on the surface. Such light weight rock is called by the Hawaiians AA. (ah-ah).

PAHOEHOE is much better than AA for making foundations and buildings. When they are new both are very black all over because they are made of a chemical called basalt. However after they stand out doors for along time the surface becomes brown. Since the AA has so many holes in it the color tends to become brown all the way thru. However the piece I am sending shows at least some black inside where I have broken it.

See if you can tell which piece is PAHOEHOE and which is AA. If you like these maybe I can find some other interesting kinds of rocks. Do you know what kind of rocks are under the surface of the ground in Illinois near Wheaton? Ask your father.

Uncle Grote.