



From *Secret of Everyday Things* by Jean H. Fabre

WHAT might not a stone teach us if we could only make it tell its story; or, rather, if we could read what it offers to eyes that know how to decipher the inscription? Perhaps some very interesting facts. A pebble has so long a life! It is as old as the world. It has witnessed events of the remotest antiquity, but is a silent witness and guards its secrets so well that we can get little clue to them even by the most attentive study. Nevertheless let us attempt to study.

"We will go down to the river near by, where the water runs over a bed of stones that are worn smooth as if some patient marble-cutter had taken it into his head to polish them. There are some almost as round as balls, others oval, still others flat, some large and some small, some short and some long, and others that are white, ash-colored, gray, black, or reddish. The smallest look not unlike the sugarplums that fill the confectioner's jars. All are remarkable for their polished surface. Their smooth outlines are pleasing to the touch. These water-worn stones found in our streams are known as pebbles or pebble-stones.

"Who fashioned and polished them in this manner? A fragment of stone such as is broken from a rock by some chance does not look at all like this. It is irregular, angular, rough to the touch. On the rocky slopes of mountains are seen only stones as shapeless as those that the road-maker leaves piled up along the way after he has broken them. Why, then, when under water are they always sleek and round? The answer is not far to seek.

"As a result of the disturbance created by storms, by the melting of great masses of snow, and by violent freshets, the river receives a vast quantity of loose stones that have been swept down from the neighboring slopes. These stones are at first shapeless, with the sharp edges and the many irregularities of stones broken by chance. Henceforth they are under water in the bed of the river. What will be the result? You will know if you stop to think what would take place if a multitude of little irregular pieces of stone were shaken for a long time in a rolling cask.

"Falling against one another unceasingly, clashing together and in constant friction, these pieces would gradually lose their sharp corners, tone down their little roughnesses, and end by becoming perfectly smooth. Marbles, which you prize so highly, are rounded and polished in this way. Small pieces of stone are first roughly shaped with a hammer, then thrown into a rolling cask, and there the work is finished and brought to perfection.

"Running water plays the same part as the rolling cask. At the season of high water the force of the current displaces the stones lying at the bottom of the stream and carries them away, rolling them long distances. Continually dashed one against another, these stones gradually become rounded, after which the loose sand carried away with them rubs and smooths them; and lastly the fine mud that is washed over them again and again imparts, by its gentle action, the final polish. But work of this sort takes a long time. If months do not enable the river to fashion its pebble-stones, it will take years; if years are not enough, it will take centuries; for in this matter time is of no account.



"That is how every stream, from the largest to the smallest, strews its bed with rounded pebbles, often in vast quantities. Running water has rolled them along while shaping them; it has carried them sometimes long distances, so that in order to find stones of like nature you would have to go back to the mountains where the brook or the river had its rise. There only would be found the rock that had yielded the fragments destined to become the pebbles of the plain.

"What, you may ask, is the use of this history of pebble-stones? You will see. Each of us may have chanced to notice, far from any stream, either in a flat country or on some hillside or even on some considerable height, great piles of round, polished pebbles similar in every way to those rolled down by rivers. In each instance there is the same smooth surface, the same rounded shape like that of a ball or an egg or a big sugar-plum or a disk. The stones we select one by one on the river-bank in order to make them skim along the surface of the water are not better shaped.

"What, then, has given to these pebbles the form they wear? Evidently running water, for they do not differ from the pebbles found in brooks and rivers. Water has washed them thither, polishing them on the way by mutual friction – the same process that goes on in every river-bed. There is no doubt about that: their rounded form tells the story of these stones very plainly.

"But to-day these piles of pebbles, covering large tracts of land to a great depth, occupy regions that in many instances have not even the tiniest brooklet. Where formerly rivers ran and impetuous torrents roared, there is now nothing but dry land. The streams have all disappeared and their beds alone remain, sometimes several leagues wide, like those of the largest rivers of the world.

"History makes no mention of these ancient streams. Nor can it speak of the them, for it is doubtful whether man ever saw them; and if he saw them, the centuries have effaced all remembrance of them. Trails of pebbles are the only witnesses that tell us where these streams once ran.

"Now these pebble-trails occupy steep slopes and lofty heights that rise far above the surrounding plains. Never could rivers have run over such heights. A stream must have for its bed some ravine, not a ridge of hills. How, then, can we reconcile these two contradictory facts, that running water has certainly been there, as proved by the multitude of smooth pebbles still remaining, and that water could not have reached such heights even in the greatest floods?

"The contradiction disappears and everything is explained when we consider that the earth's surface is subjected to constant variation. Time works changes in all things, even in mountains. In the course of centuries what was once a valley may become a plain, and what was a plain may rise and form a hill. Earthquakes and the sudden uprising of Monte Nuovo, near Naples, have already furnished us some information on this curious subject; and pebbles furnish us still more. They tell us that the heights they now occupy were formerly plains or valleys where mighty rivers ran; they bear witness that what is now a pebbly mountain-side where one would search in vain for the tiniest spring was in ancient times the bed of a raging torrent; they teach us, in a word, that in ages long past profound upheavals changed the surface of the earth. Such is the strange history that a pebble tells us when we know how to question it."