By Gabriel Dache, Science News Editor

Soda Might Have Powered Geysers on Mars

Four-kilometer-high geysers may have erupted on Mars

On Earth, there are two distinct ways through which water may erupt from beneath the surface into columns stretching as high as 45 meters or more. The first is by pushing water up into the air with steam coming from the deep underground. The second uses the force provided by carbon dioxide gas making its way to the surface. Scientists say that Mars could have had such geysers back in its past, however they must have been much more spectacular than those on Earth. Geysers erupting on the surface of Mars were most likely powered by carbon dioxide gas, say scientists, pushing hailstone and mud a few kilometers up into the atmosphere, making geysers on Earth look like midgets. Alistair Bargery from the Lancaster University says that in order to understand the process behind the geysers on Mars, one only has to remember what happens while shaking a bottle of soda. When opening the bottle, a column of soda rushes immediately up into the air. There are two distinct places on Mars that appear to present cracks on the surface, from which large quantities of water would have raised high up into the atmosphere. By the looks of the features of these cracks, spanning up to a hundred kilometers, scientists estimate that a debit of water 10 to 100 times larger than that of the Amazon River could have been circulating through the channels linking with the cracks on the surface. Found several kilometers away from the cracks, erosion signs reveal that these geysers were basically enormous, and erupted to the surface a large proportion of the water brought in by the channels. At the Mangala Fossa, it appears that muddy water fell from the sky soon after eruption, leaving behind only sediment after the water evaporated to create ridged rock formations. Alternatively, the sediment could be explained through lava flows, but the evidence does not add up with the solidified lava scenario, due to sediment orientation in relation to the flow. By correlating the distance of the rock deposits in relation to the cracks, scientists approximated that watery mud could have reached altitudes as high as four kilometers, meaning that the geyser was able to transport material to distances up to eight kilometers from the crack. According to Bargery, the sheer power could have been provided only by very deep water sources, maybe 3 to 4 kilometers under the surface. Because the pressure is much higher at greater depths, large quantities of carbon dioxide gas could have easily dissolved into the water deposit; then, once the water deposit came in contact with the surface, a high-pressure water column would have immediately rushed to the surface and up into the air, at speeds up to 400 kilometers per hour. The impressive heights to which geysers on Mars could have risen is also greatly influenced by the gravity of the planet which is just slightly over one third of that experienced on Earth. A fact even more impressive would be the capability of shooting columns of water high into the atmosphere as long as one to two months at a time, which dislocated massive amounts of matter along with water. Considering the temperature of Mars' atmosphere at an average of about -70 degrees Celsius reveals that the water would have quickly frozen in the air and rained down in the form of hailstone. John Dixton, geologist at the University of Arkansas, agrees that the evidence could point to an eventual carbon dioxide geyser. One thing is for certain though - the features don't point to terrestrial lava flows! Scientists approximate that Martian geysers could have been active until relatively recently, since the channel which connects with the Cerberys Fossae is less than 20 million years old.