The Making of Mount Sharp

I'm Ashwin Vasavada, Deputy Project Scientist for the Mars Science Laboratory mission and this is your Curiosity Rover Report.

Curiosity has spent the last two months studying the first rocks that we can tie to the base of Mount Sharp, the 3-mile-high mountain in the center of Gale Crater.

This is our first look at what the mountain is made of. We're now, more sure than ever that we're going to learn about the early history of Mars, it's changing climate, and the potential for Mars to support life.

To tell you why we're so excited, we have to go back a few months when we were still a few miles away from Mount Sharp. At that point, our team started noticing distinct patterns on the rocks around us. Ther e were tilted beds of sandstone all facing south in the direction of Mount Sharp.

The geologists in our team concluded that these tilted beds of sandstone formed where streams empty into standing bodies of water, like lakes.

The sediments carried by the flowing water sink when they enter the lake, forming a sloped wall that slowly advances forward as sediment continues to fall.

In September of this year, Curiosity arrived at the rocks that form the base of Mount Sharp itself. What we found waiting for us was a new type of rock: one that forms when tiny particles of sediment slowly settle out within a lake, forming mud at the lake bottom.

These mudstones are very finely layered, suggesting that the river and lake system is going through cycles of change.

Our hypothesis is this: where now there is a mountain, there once was a lake. Over a span of perhaps millions of years, water flowed from the northern rim of Gale Crater toward the center, bringing sediment that slowly formed the lower layers of Mount Sharp.

At any one time, the lake may have only been a few meters deep, just enough to form those sandstone deltas and thin layers of mud. But fluctuations in the water supply or the climate allowed this to happen over and over, slowly building up the mountain.

Over the next few months, we'll continue to climb up the lower layers of Mount Sharp to see if our hypothesis for how it formed holds up.

We'll also look at the chemistry of the rocks to see if the water that was once

present would’ve been of the kind that could support microbial life, if it ever was present.

With only 30 vertical feet of the mountain behind us, we're sure there's a lot more to discover.

I’m Ashwin Vasavada and this has been your Curiosity Rover Report.