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Mars life report not so far-fetched

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AMHERST - Last week a report circulated that two NASA scientists had found an indication in the Martian atmosphere that life exists on the Red Planet, albeit tiny microbes living in isolated pools of water in caves or other spots below the surface.

The report proved false, but University of Massachusetts microbiologist Derek R. Lovley won't be surprised if future Mars missions ultimately prove the contention true.

A few years ago, Lovley went looking for potential Martian life in a geothermal spring in Idaho - and found it.

In a place called Lidy Hot Springs in the Beaverhead Mountains along the Continental Divide, he and a colleague, Francis H. Chappelle, of the U.S. Geological Survey, discovered tiny one-celled organisms living in water 660 feet below the surface, completely cut off from sunlight and organic matter - the things most every living organism on Earth needs to survive. If life did exist on Mars, Lovley knew, those are the hostile conditions in which it would have to thrive.

"The concept was that if there is life on Mars currently, it must be below the surface because the surface is much too hostile," he said.

Yesterday, it was announced that the European Space Agency's Mars Express, in orbit around the planet, found what in all likelihood are remnants of ice near the planet's equator that were formed in the geologically recent past, perhaps just two million years ago. The report suggests that there may still be liquid water beneath the surface.

It has been a long-standing belief that there is subsurface water on Mars. That is what prompted Lovley and Chappelle to search for a location on Earth where there were fissures deep underground in which water had collected and then been isolated from the surface through the centuries. They found just

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such conditions in Idaho near the Montana border.

They sampled groundwater there in the summers from 1999 to 2001, searching for life in the subterranean pockets of water. To their surprise, what they found were tiny organisms called methanogens. They converted hydrogen in the water to energy and produced the byproduct of methane gas.

"This was the first time life had been seen in an environment where you can very definitely say there was no input of organic matter. It turns out to be quite a unique location. No one has found another place like it since," Lovley said.

In a paper published in the journal Nature in 2002, the two researchers speculated that methanogens were the type of life-forms that may exist on Mars and other planets.

Last week, a report surfaced on an Internet site that two NASA scientists told a group of space officials at a private meeting in Washington that they had found signs that life-forms, such as what Lovley and Chappelle anticipated, exist on Mars currently. A day later, NASA denied that any of its scientists had come to that conclusion.

However, it is no secret that the search for life on Mars is in high gear and that methanogens are the prime suspect. NASA, with its rovers Opportunity and Spirit, has detected methane in the atmosphere as has the Mars Express.

There are several ways methane can be produced that do not involve living things, such as chemical processes in the atmosphere. A key question to be answered, said Lovley, is whether the methane is equally distributed over the planet, which would suggest an atmospheric chemical process, or whether the methane levels vary over the planet's surface, which would suggest that life-forms concentrated in certain areas are producing it.

Eventually, a mission to Mars will be planned so that deep drilling can be conducted to search for methanogens, he said. "The studies will continue and they'll eventually find out if life exists there."

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