

UMass scientist poses new theory of life

By STAN FREEMAN

Staff writer

AMHERST - It's possible for most people to see how man could rise from apes or how dinosaurs could arise from small reptiles, but it's a lot tougher to see how life itself could arise from the cauldron of chemicals that was the earth a few billion years ago.

University of Massachusetts microbiologist Derek R. Lovley may have shed some light on that mystery in an article published last

week in *Nature*, one of the world's premier science journals.

Lovley, who studies bacteria that live in extreme environments, said that a hyperthermophile, a type of modern bacteria closely related to the earliest life-forms, is able to create the energy it needs to function from iron, a substance known to be abundant on earth 3 to 3.5 billion years ago.

"It's been a source of speculation for some time what these mi-

croorganisms used to create their energy, he said.

"But iron has not been one of the compounds that has been considered. The geologic evidence is quite clear, though, that there was a lot of this iron in the proper state for bacteria to be able to use it."

It had been thought that sulfur was used by these single-celled organisms to metabolize for food. But geologists found that sulfur did not exist in the proper form in that early era on earth, leaving

them at a temporary dead end.

Lovley, the head of the UMass microbiology department, studied seven forms of hyperthermophiles and found all could use iron essentially as food to create energy.

He said that life probably did not begin on the earth's surface.

"A lot of the current thinking is tending toward life beginning in subsurface environments, because of the high UV (ultraviolet) radiation on the surface" due to the lack of atmospheric ozone to block it

out, he said.

Evidence of these iron-eating bacteria - the mineral, magnetite that was left over once they had processed the iron - can be found four to five miles below the surface, he said.

While his finding may explain how the earliest life-forms kept going once they developed, it still doesn't explain how they developed in the first place, Lovley said.

"That is still one of the great mysteries," he said.