How would the world change if we found extraterrestrial life?

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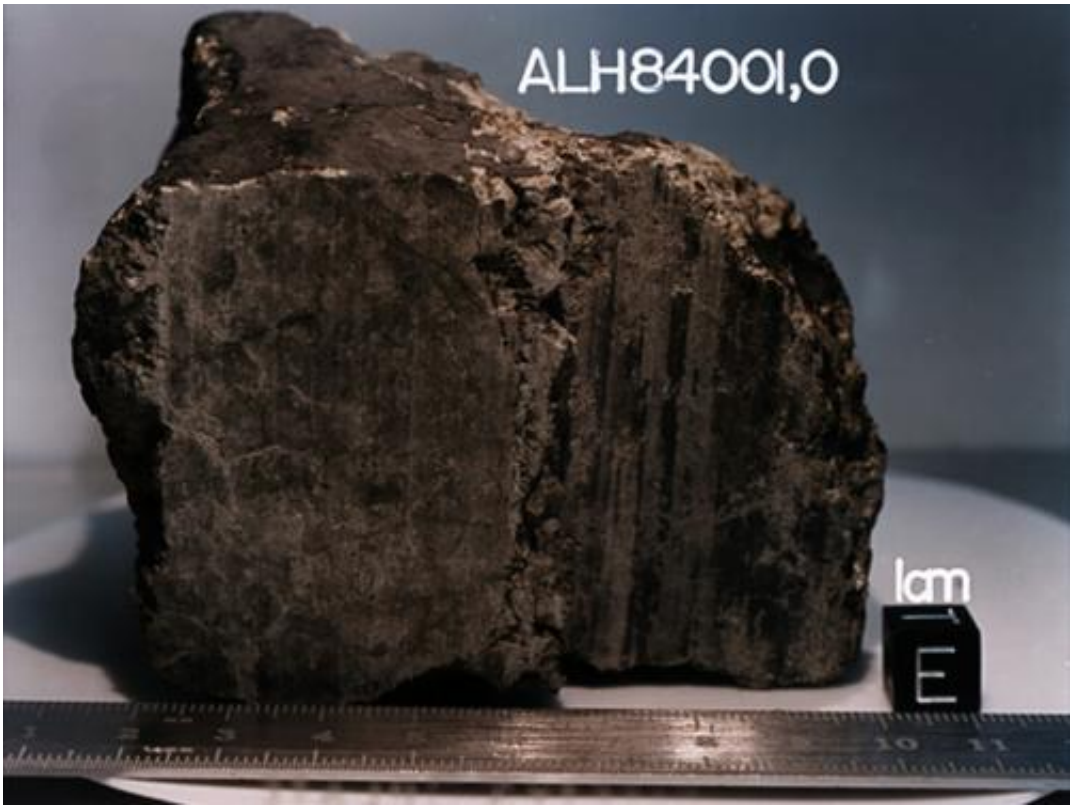


Elizabeth Howell The ALH84001 meteorite, which in a 1996 Science publication was speculated to be host to what could be ancient Martian fossils. That finding is still under dispute today. Credit: NASA/JSC/Stanford University

In 1938, Orson Welles narrated a radio broadcast of "War of the Worlds" as a series of simulated radio bulletins of what was happening in real time as Martians arrived on our home planet. The broadcast is

widely remembered for creating public panic, although to what extent is hotly debated today.

Still, the incident serves as an illustration of what could happen when the first life beyond Earth is discovered. While scientists might be excited by the prospect, introducing the public, politicians and interest groups to the idea could take some time.

How extraterrestrial life would change our world view is a research interest of Steven Dick, who just completed a term as the Baruch S. Blumberg NASA/Library of Congress Chair of Astrobiology. The chair is jointly sponsored by the NASA Astrobiology Program and the John W. Kluge Center, at the Library of Congress.

Dick is a former astronomer and historian at the United States Naval Observatory, a past chief historian for NASA, and has published several books concerning the discovery of life beyond Earth. To Dick, even the discovery of microbes would be a profound shift for science.

"If we found microbes, it would have an effect on science, especially biology, by universalizing biology," he said. "We only have one case of biology on Earth. It's all related. It's all DNA-based. If we found an independent example on Mars or Europa, we have a chance of forming a universal biology."

Dick points out that even the possibilities of extraterrestrial fossils could change our viewpoints, such as the ongoing discussion of ALH84001, a Martian meteorite found in Antarctica that erupted into public consciousness in 1996 after a Science article said structures inside of it could be linked to biological activity. The conclusion, which is still debated today, led to congressional hearings.

"I've done a book about discovery in astronomy, and it's an extended

process," Dick pointed out. "It's not like you point your telescope and say, 'Oh, I made a discovery.' It's always an extended process: You have to detect something, you have to interpret it, and it takes a long time to understand it. As for extraterrestrial life, the Mars rock showed it could take an extended period of years to understand it."

Mayan decipherments

If contact with extraterrestrial life is made through radio telescopes, a decipherment process may have to take place to understand the message. Credit: NASA

In his year at the Library of Congress, Dick spent time searching for historical examples (as well as historical analogies) of how humanity might deal with first contact with an extraterrestrial civilization. History shows that contact with new cultures can go in vastly different directions.

Hernan Cortes' treatment of the Aztecs is often cited as an example of

how wrong first contact can go. But there were other efforts that were a little more mutually beneficial, although the outcomes were never perfect. Fur traders in Canada in the 1800s worked closely with Native Americans, for example, and the Chinese treasure fleet of the 15th Century successfully brought its home culture far beyond its borders, perhaps even to East Africa.

Even when both sides were trying hard to make communication work, there were barriers, noted Dick.

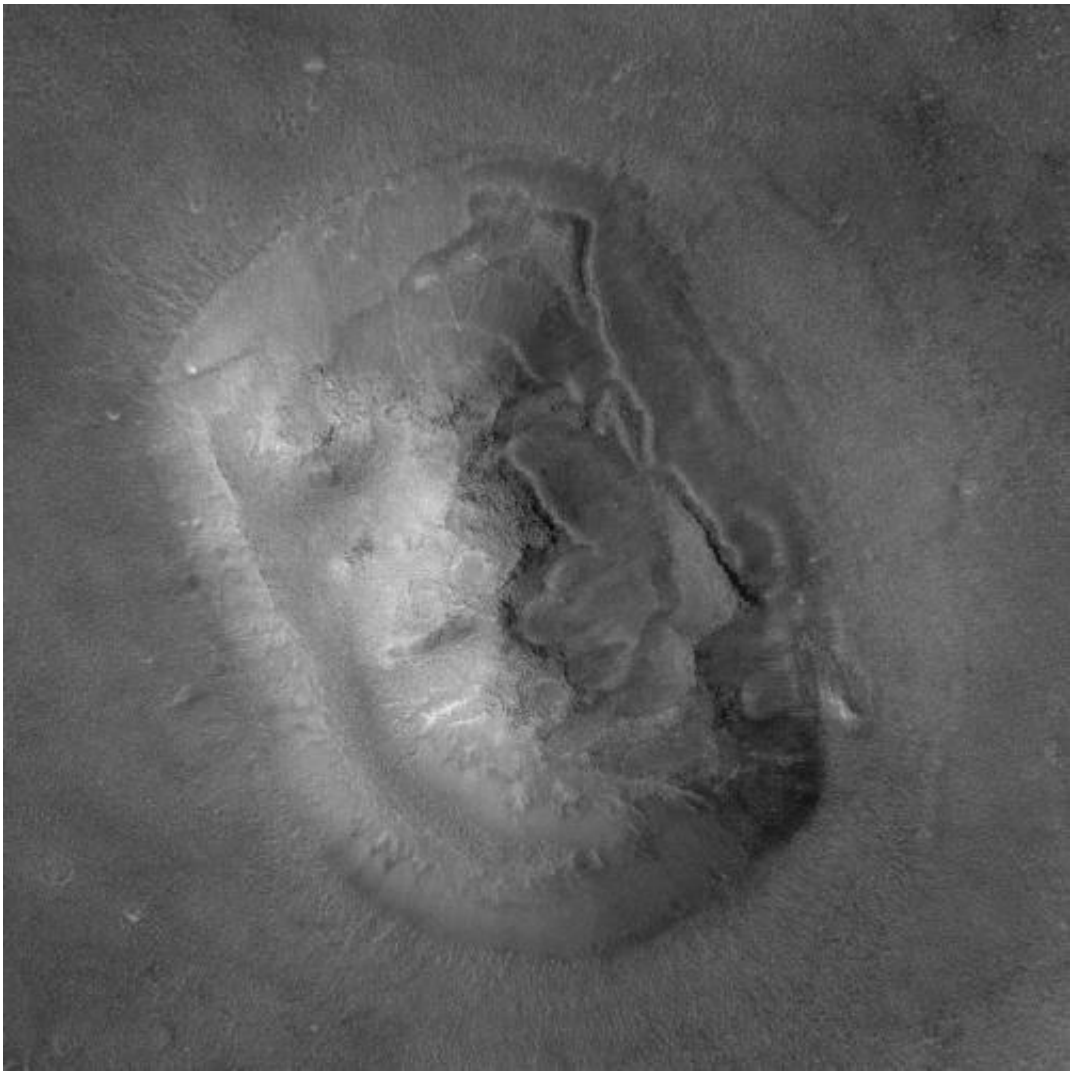
"The Jesuits had contact with Native Americans," he pointed out. "Certain concepts were difficult, like when they tried to get across the ideas of the soul and immortality."

Indirect contact by way of radio communications through the Search for Extraterrestrial Intelligence (SETI), also illustrates the challenges of transmitting information across cultures. There is historical precedence for this, such as when Greek knowledge passed west through Arab in the 12th Century. This shows that it is possible for ideas to be revived, even from dead cultures, he said.

It's also quite possible that the language we receive across these indirect communications would be foreign to us. Even though mathematics is often cited as a universal language, Dick said there are actually two schools of thought. One theory is that there is, indeed, one kind of mathematics that is based on a Platonic idea, and the other theory is that mathematics is a construction of the culture that you are in.

"There will be a decipherment process. It might be more like the Mayan decipherments," Dick said.

The ethics of contact

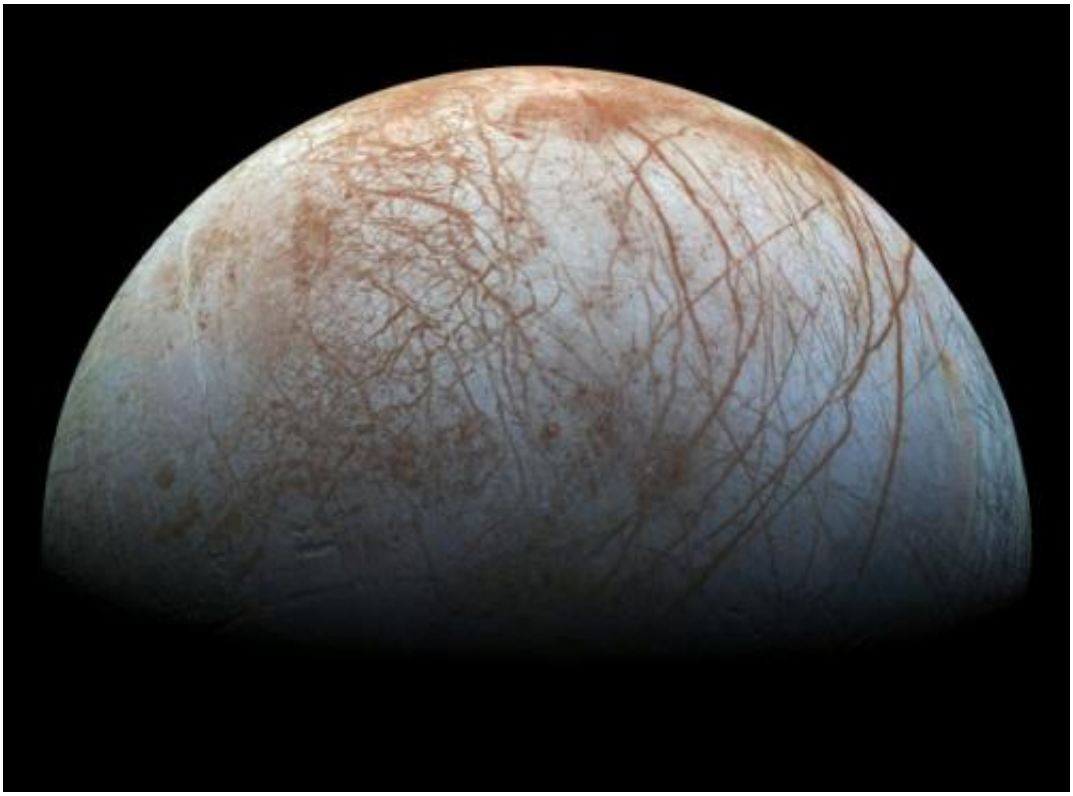


A second look by the Mars Global Surveyor at the so-called Viking “Face on Mars” in Cydonia revealed a more ordinary-looking hill, showing that science is an extended process of discovery. Credit: NASA/JPL/Malin Space Science Systems

As Dick came to a greater understanding about the potential cultural impact of extraterrestrial intelligence, he invited other scholars to present their findings along with him. Dick chaired a two-day NASA/Library of Congress Astrobiology Symposium called "Preparing

for Discovery," which was intended to address the impact of finding any kind of life beyond Earth, whether microbial or some kind of intelligent, multicellular life form.

The symposium participants discussed how to move beyond human-centered views of defining life, how to understand the philosophical and theological problems a discovery would bring, and how to help the public understand the implications of a discovery.



Finding microbes on a moon such as Europa could alter the culture on Earth, even though they are not considered intelligent life. Credit: NASA/JPL-Caltech/SETI Institute

"There is also the question of what I call astro-ethics," Dick said. "How

do you treat alien life? How do you treat it differently, ranging from microbes to intelligence? So we had a philosopher at our symposium talking about the moral status of non-human organisms, talking in relation to animals on Earth and what their status is in relation to us."

Dick plans to collect the lectures in a book for publication next year, but he also spent his time at the library gathering materials for a second book about how discovering life beyond Earth will revolutionize our thinking.

"It's very farsighted for NASA to fund a position like this," Dick added. "They have all their programs in astrobiology, they fund the scientists, but here they fund somebody to think about what the implications might be. It's a good idea to do this, to foresee what might happen before it occurs."

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