Relaxing planetary protection could be fatal to future life-seeking missions

The 11 August article, "Fear of microbial taint curbs Mars explorers" (Paul Voosen), comments on NASA's consideration of reducing planetary protection standards for missions to Mars, allowing restrictions placed on the rover Curiosity's freedom to roam into "special regions" of the planet to be relaxed. Such a decision is short-sighted and counter-productive for at least two reasons. First, as reported in the article, Alberto Fairén, a planetary scientist at Cornell University, supports the relaxation regardless of its potential contamination of Mars with Earth organisms. He cites that even if some contaminating organisms do survive, "future missions could distinguish between earthly and martian microbes by sequencing their genomes." That may hold true *if* you had the alien organism's DNA to sequence. However, much of the ongoing search for potential extraterrestrial life is directed at seeking the signs of life, not the organism itself. For example, NASA's two Viking missions in the late 1970s sought chemical signatures associated with biological activity, such as gasses produced by metabolism, not the discrete organisms themselves. Contamination with Earth organisms may produce similar signatures, confounding future searches. Second, Jim Kasting, a geoscientist at Pennsylvania State University, said that martian soil has proved to be so lethal that the "chances of finding life...in the near-surface environment are close to nil." This assumes martian life could not have evolved to adapt to what we, on Earth, would find deadly. But even our search for life on Earth continues to discover organisms thriving in areas we only recently believed lethal to all life, such as under thermal, pH, pressure, low humidity, salinity, radioactive and other so-called extreme conditions. Presuming an alien form is not tolerant of extraterrestrial conditions is not defensible. Also, the "near-surface environment" does not describe environments that may be found a bit deeper, such as in lava tubes or potentially wet areas shielded from the radiation and temperature swings experienced on the surface. How any potential endemic life might migrate from near-surface to deeper zones is unknown, and contaminating Earth organisms may potentially find their way into these regions.

The discovery of extraterrestrial life would be one of our most significant scientific findings. We should proceed with extreme caution and not allow engineering conveniences or political expediencies to destroy the scientific gem we are seeking.

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