GEOSCIENCES AND REMOTE SENSING

&

GEOCHEMISTRY, ENVIRONMENTAL CHEMISTRY AND ATMOSPHERIC CHEMISTRY October 19-20, 2018 | Ottawa, Canada



Barry E DiGregorio

University of Buckingham, England

Ichnological evidence for bioturbation in an ancient lake at Vera Rubin Ridge, Gale Crater, Mars

hile most of the focus for the search for life on Mars has remained microbial in context, little real consideration has been given to the idea that Mars may have had conditions suitable for life before the Earth and that life on Mars may have evolved to the multicellular level in its distant past. Although not designed as a life detection mission, NASA's Curiosity rover has a suite of cameras and instruments that could potentially reveal the presence of macrofossils. On sol 1922 of Curiosity's mission in Gale Crater, its microscopic imager (MAHLI) camera returned images to Earth of enigmatic dark toned features on a rock called Haroldswick located near the top edge of Vera Rubin Ridge, once the site of an ancient freshwater lake in Gale Crater. Remarkably the Haroldswick rock and dark toned features are part of at least five rocks in close proximity to each other. A variety of dark shapes resembling millimeter-sized rice and bean-shaped objects pepper the outside of their host rocks. The host rocks on Vera Rubin Ridge where these features were found appears to be a succession of the Murray formation that the Curiosity rover has been driving through for 300 vertical meters over the last two years and 9 kilometers . It has a composition of SiO, around 50, total iron (FeOtot) around 19 wt. %, Al₂O, around 11 wt. %, MgO around 5 wt %, low Ca, and moderately high alkalis (several wt. % each for Na₂O and K₂O). Haroldswick and its peculiar elongated tube-like features are the first of their kind observed on Mars. The Curiosity rover team refers to the dark features as sticks or crystals. However, morphologically they have some characteristics resembling terrestrial trace fossil burrows. The rover team contends the shapes are characteristic of gypsum crystals that form when salts become concentrated in water, such as in an evaporating lake. Unfortunately, according to the rover team none of the instruments onboard curiosity including Chemcam and the APXS were able to obtain any usable data on these features before deciding to move the rover to its next target site meters away.

Biography

Barry E DiGregorio is the founder and director of the International Committee Against Mars Sample Return (ICAMSR), which urges the scientific and environmental communities to consider avoiding the return of Martian samples directly to Earth. He is a research associate for the Buckingham Centre for Astrobiology in the UK and a professional science writer. He is also the author of the book "Mars: The Living Planet," a 1997 re-examination of the Viking biology results.

barry.dig@verizon.net

Notes: