A search for life in the universe



Jayant V. Narlikar, Inter-University Centre for Astronomy & Astrophysics, Pune, India

While the more glamorous programme of contacting the extraterrestrials (ETs) through radio messages goes on, here is an alternative to finding if we are alone in the universe. This alternative is less ambitious but may still provide the answer sooner.

A century or so ago Arrhenius had suggested that life maybe travelling across space in microbial form, an idea that was followed up in the 1970s by Fred Hoyle and Chandra Wickramasinghe. Known as 'panspermia', these viruses and bacteria were proposed by them as being ubiquitous, occupying vast stretches of interstellar space. Some of them may travel towards the Earth, riding piggyback in frozen mantles on comets. As they approach the Sun, the comets develop tails which may sometimes brush the upper reaches of the Earth's atmosphere. These events according to Hoyle and Wickramasinghe (H&W) help transfer the microorganisms to the Earth, since they would descend to the Earth's surface eventually. Indeed H&W suggested that such input served as seeds for life on Earth: so we may all be ETs!

The panspermia hypothesis was severely criticised on the grounds that the panspermia would not survive UV, X-ray or γ-ray radiation in space. This criticism has been countered to some extent by laboratory experiments showing that the bacteria mutate and learn to survive even if subjected to radiation doses. So can we test the H&W hypothesis by direct experiment.

Such attempts are being made and in 2001, a payload attached to a balloon was sent up to a height of 41 km above the Earth's surface to collect samples of air. The National Balloon Facility at Hyderabad, India was used. The samples were brought down to Earth and analyzed by biologists. The entire process of collection and analysis was performed with the highest regard to avoiding contamination. Biological analyses by labs, one in Hyderabad, and the others in Cardiff and Sheffield, UK, showed evidence of living cells and bacteria in some of the samples. The question is where are they from?

Some bacteria show unusual resistence to UV-radiation. All are known species although there are some differences from their known terrestrial counterparts. While all this is consistent with the H&W hypothesis, can one definitely rule out that these bacteria reached 41 km height from the surface of the Earth? As of now we do not know of any process that could transport terrestrial material to such heights; even volcanic ash does not rise above 25 km.

Clearly further experimentation is needed. A second balloon flight was arranged last year the results from which are being analyzed.

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