

Astrobiology

a useful oxymoron

In response to the recent Comment by Howard Gest, **Milton Wainwright** points out that while 'astrobiology' is an oxymoron, it remains a useful term.

Howard Gest is clearly less than enthusiastic about the 'science of astrobiology' (Comment, *Microbiology Today* 32, 156). He is right to point out that the word astrobiology refers to life in relation to the stars (i.e. generally space) and since no life has yet to be found there his etymological pronouncements cannot be faulted. Of course, we may yet prove that fossil bacteria do exist in the Allen Hills meteorite, while Gil Levan remains convinced that the Viking Lander found life on Mars. For the moment, however, we can accept the premise that life has yet to be definitely found in space. As one who had an old fashioned grammar school education I would be the first to argue against the use of etymologically meaningless terms. However, as Fowler frequently pointed out in his *Modern English Usage*, language is nothing if it is not useful. The term astrobiology is certainly useful, in that it brings together a whole range of diverse subjects.

Professor Gest is also correct to point out that astrobiology has a ridiculously wide remit. We microbiologists could solve this perceived problem by using the term astromicrobiology and limiting this science to microbial life in space.

There is also no doubt that many people, particularly those studying extreme environments, have jumped on the 'life in space' funding band wagon. Astrobiology meetings are, for example, frequently populated by people discussing the arctic environment in relation to space; since such environments are relatively warm, perhaps we have found yet another new science, namely 'tropical astrobiology'; the word 'model' covers many sins! For my part I would wish to restrict astrobiology to studies on non-Earth environments. For example, we have yet to determine how far into space the biosphere extends; perhaps some of the large amounts of money spent in Antarctica might be diverted to help answer this question.

I also agree that NASA somehow rediscovered the subject of extremophiles. Similarly, it is always amusing to view TV science programmes like *Horizon*, and learn that some post-graduate student has recently discovered that the hot springs of Yellowstone Park are teeming with life! However, I would put the study of microbial life in extreme conditions, beyond the 1940s, and back to the early years of the 20th century, when Arrhenius suggested his version of panspermia and Macfadyen was proving that bacteria can survive at extremely low temperatures.

To conclude then, the term astrobiology, although etymologically imprecise, is extremely useful in that, under its umbrella, we can have astrobiology societies and journals and bring together interested parties at astrobiology conferences. When we eventually find life beyond the stratosphere, we will have a science up and running to further exploit what will be the most important discovery in the history of mankind. We can then toast the fact that events have overtaken etymology, and that at last the word astrobiology means something; at this point anyone disposed towards pedantry will be able to sleep soundly in their beds!

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Further reading

Gilmour, I. & Sephton, M.A. (eds.) (2003). *An Introduction to Astrobiology*. Cambridge: Cambridge University Press.

Wainwright, M. (2003). A microbiologist looks at panspermia. *Astrophys Space Sci* 285, 563–570.