

When reference means deference

Hoyle and Wickramasinghe protest that none of the contributors to recent accounts of the encounters with Halley's comet have referred to them. But they have only themselves to blame.

WHAT follows is a sad but disturbing tale, which is told not for the sake of making further trouble but in the hope of stilling what there is already. It centres on the recent encounters of the two Soviet Vega spacecraft and the European Giotto spacecraft with Halley's comet in March, the publication of preliminary accounts of the encounters in *Nature* on 15 May, the publication in the succeeding issue (321, 385; 1986) of a "prediction" (published after the event) by Professor J.M. Greenburg at the University of Leiden that the surface of the nucleus of Halley's comet would appear black and the complaints of two British scientists, Sir Fred Hoyle and Professor Chandra Wickramasinghe, that their own earlier predictions to the same effect have willfully and even maliciously been overlooked.

Most readers will not have ready access to the documents in which the complaints surface, which consist chiefly of "pre-prints" circulated from the Department of Astronomy at University College, Cardiff. The description of this now considerable volume of largely unpublished literature is a misnomer, because much of it is plainly not written with the intention that it should go through the processes that ordinarily precede publication, scrutiny by referees, for example. This is certainly the case with "Cardiff Astrophysics and Relativity preprint No. 125", dated 1 June 1986, under the title *On deliberate mis-referencing as a tool of science policy*, which has been artfully contrived to appear as if it were the galley proof of a letter due to appear in *Nature*. (For future reference, the authors of this little joke should know that our type size is known in the trade as "9 on 10", not "9 on 11", and that our wide columns are 20.6, not 20.0 "ems" wide.)

Readers will also know that Sir Fred Hoyle is one of the most talented and ingenious theoretical scientists since the Second World War. With Bondi and Gold, he launched the steady-state theory of cosmology, with a variety of collaborators (W.H. Fowler and the two Burbidges) he laid down the outlines of the theory of nucleogenesis and, almost as if in passing, showed how to calculate the evolution of stars. Latterly, Hoyle has been exploring a question originally posed in urgent form by Wickramasinghe, that of the constitution of interstellar dust. Many readers will know the eccentric direction this work has taken. Hoyle and Wickramasinghe

have remarked that carbon is a common constituent of interstellar dust (as it is of gas), that much of this carbon is in the form of sedimentary organic molecules and have then gone on, in a series of mostly *samizdat* publications, to argue that the prevalence of interstellar carbon only goes to support one of the other theories to which they are attached. They say that life as it is known on the surface of the Earth is genetically far too complicated to have arisen by means of darwinian evolution from primordial chemicals, that at least the first steps in the evolution of life are likely to have taken place "out there" and that, as it happens, comets are likely to have been among the means by which the surface of the Earth is from time to time repopulated by external organisms.

Those writing off for a copy of preprint 125 should be sure also to ask for preprint 121, dated 1 March, which put forward a particular model of the constitution of the periodic comets (of which Halley is one). Most of the objects, the argument goes, will have lost volatile material from the outer surface, which will therefore be a loose uncompact "protective" skin of material with low refractive index and, therefore, low reflectivity for sunlight. The authors are partly concerned to explain the discrepancy between the calculated and observed (only a tenth as many) number of periodic comets; their solution is to suggest that most periodic comets slip by unobserved, but that those with more than one nucleus become visible because the nuclei rub against each other, exposing parts of the volatile interior to solar radiation. Hoyle and Wickramasinghe did not on 1 March say so explicitly, but it may be inferred from their general discussion that the surface of Halley's comet was predicted to appear mostly black.

The complaints in preprint 125 are more entertaining. First, they marvel at Greenberg's "sibylline achievements" in predicting what Halley's comet would seem like after the event, overlooking that Greenberg's model is radically different from their own; in fact the reason for its publication was not that it made a "prediction" but that it is a model of which many readers of *Nature* would not previously have heard. Second, they remark, in sorrow rather than anger, that none of the Halley authors in the issue of 15 May refers to them. They go on to note that, in its time, *Nature* has been guilty of removing a reference to their work from an article writ-

ten by a third party. Finally, they darkly speculate on the possibility that this neglect may simply have been a consequence of this journal's malign attitude both towards themselves and as a willing "vehicle of propaganda for Darwin's theory". They suspect that it may be a "management condition" that "persons judged to be a threat to Darwinism are to be blotted out from the scientific world".

This lengthy reply to what Hoyle and Wickramasinghe allege stems not so much from the circumstance, attested by preprint 125, that the authors and the present editor of *Nature* are old friends but from a wish that these two talented people should come to see the error of their ways. But in passing, it should be known that the sinister deleted reference was a reference to their panspermiology in D.A. Allen and D.T. Wickramasinghe (*Nature* 294, 239; 1981), an otherwise helpful measurement of infrared absorption in interstellar space.

Moreover, they may be right about comets. Much of what they have written over the years deserves to be widely read, for example the argument that comets contain polyformaldehyde (Vanysek, V. and Wickramasinghe, N.C. *Astr. Space Sci.* 33, 19; 1975) or the demonstration (with W.K. Wallis) that comets Cernis and Bowell probably contain organic molecules rather than water-ice (*Earth, Moon and Planets* 33, 179; 1985). What these authors seem incapable of understanding is that their panspermian convictions sully even their sober contributions to the literature. People who might (and even should) read their articles on comets do not do so for the simple reason that they half expect to find there a rehearsal of the now familiar and widely popularized view that life began in space.

Not that even that is necessarily wrong. Time may yet show that Hoyle and Wickramasinghe have been true prophets crying in the wilderness of disbelief. Yet as things are, there is no evidence but conjecture on their side. Their flimsy account of the origin of life has as its sole foundation their scepticism of the efficacy of natural selection among primordial molecules. It is as if a particle theorist chose to say that, while the Higgs boson remains undiscovered, the only partly successful theory so far must be discarded and all others, however flimsy, must be given more than equal time. They ask a lot, too much for most.

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