

## CORRESPONDENCE

## Creation deduced

SIR — Having recently received, for the first time, a communication from the Biblical Creation Society which contained quotations both from my letter to you of last July (*Nature* 30 July 1981, p.403) and from Dr O'Grady's comments on it (*Nature* 10 December 1981, p.510), I am reminded that a short rejoinder to the latter is needed.

It was kind of O'Grady to think that I needed information about the writings of Messrs Hume and Popper on deductive and inductive thinking. However, what I was trying to do — perhaps not clearly enough — was to put into perspective the original dichotomy between the two modes of explaining things, a division which must surely go back, as I said, to the earliest days of man as a toolmaker. In those times deduction must have more or less automatically meant a preconceived belief in, and an assertion of the truth of, dogmas and myths. Only, I suggest, with the emergence of properly understood scientific reasoning within the past few centuries, involving the *testing* of ideas, has deduction acquired its constructive aspect and become an alternative to induction in the formulation of hypotheses which make testable predictions.

My main point was that the original "prehistoric" form of deductive thinking is still with us and flourishing — perpetuating many myths both ancient and modern. I believe "creation science" is a classic example of this as it seems only concerned to propagate, in the face of a mountain of contrary evidence, a 3,000 year old myth about the origin of the Earth and of man. If this is not so, and if creationism is scientific deductive thinking, someone will have set out the creationist hypothesis in much more detail than appears in *Genesis* and will have tested it sufficiently often and successfully to think it worth continuing. Has this happened? Perhaps the three Glasgow University biochemists (see *Nature* 26 November 1981, p.302) have done this as well as simply stating, rather negatively, that the evidence does not *disprove* the existence of a Creator?

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## Kindly explained

SIR — Marks<sup>1</sup> as well as his creationist critics<sup>2-5</sup> seem to be arguing at cross purposes. Unlike Marks, one ought not to sneer at the views of fundamentalists, just as a clinician must not disregard the delusions of a psychotic. Both types of belief mean much to those who hold them. A creationist cannot be convinced by facts or scientific arguments of any possible errors of an *a priori* infallible creed, any more than a psychotic can be shaken about the absolute truth of his delusions by rational counter-arguments. When contrasting science and creationism we must remember that we are dealing with different *kinds* of explanations concerning the world. Let me paraphrase in an evolutionary context a passage from the late C.A. Mace written in a behaviour-scientific context in an editorial foreword to a book by Vernon<sup>6</sup>.

"The difference between evolutionists on the one hand and creationists on the other arises perhaps from a failure of the latter to do justice to the fact that there are many different *kinds* of explanations. There is the kind of explanation that fossils exist, which simply says that fossils are remains of past organisms, irrespective of whether these organisms were divinely created or arose by self-organization. This is a neural kind of explanation. There is the sort of explanation which appears to satisfy evolutionists and some other life scientists, which takes the form of saying that fossils are relevant to our formulations of particular theories of evolution-specific mechanisms<sup>7</sup>. There is another kind of explanation which satisfies materialistically-minded mechanists, who (like myself<sup>8</sup>) suggest that fossils are the remains of organisms that arose by self-organization. Perhaps also some notice should be taken of the kind of explanation which satisfied children and devout old ladies who would say that fossils exist because God arranged things so as to remind us of the many beautifully adapted organisms that he has created in the past."

There is room for all of these views among the right people in the right places and in mutually exclusive ways. We must remember that different kinds of explanations rely on different premises and on different explanatory procedures. Thus, hypothetico-deductive scientific theories are not intended to proclaim absolute truths, but are, or should be, falsifiable. By contrast, the doctrines of creationists are proclaimed as absolute truths of a metaphysical kind, and do not function like scientific hypotheses. If scientific facts do not fit creationist doctrine then, with sufficient ingenuity, an indefinite number of reinterpretations of the doctrinal metaphysical statements remain possible. In the Popperian sense there exists an unlimited range of built-in metaphysical defences of fundamentalist doctrines. It is therefore not uncommon for scientists to accept two schemes which may be related to the same facts. On the one hand they may accept hypothetico-deductive theories of mechanisms. On the other hand they may embrace a metaphysical belief system which explains some of the facts known to them from science in ways totally different from the ways in which they occur within scientific theories. I know many such people and some highly intelligent ones among them, although I see no personal need to supplement science with a *fundamentalist* metaphysics. (Some kind of metaphysics is probably needed in science<sup>9</sup>.)

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1. Marks, J. *Nature* 295, 276 (1982).
2. Cousins, F.W. *Nature* 295, 452 (1982).
3. McBride, N.K. & Kreitzer, L. *Nature* 296, 8 (1982).
4. Hollin, A.J. *Nature* 295, 548 (1982).
5. Hamblin, T.H. *Nature* 296, 108 (1982).
6. Vernon, M.D. *The Psychology of Perception* (Penguin, London, 1962).
7. Wassermann, G.D. *Phil. Sci.* 48, 416-437 (1981).
8. Wassermann, G.D. *J. theor. Biol.* 96 (in the press).
9. Wassermann, G.D. *The Review of Metaphysics* (in the press).

## Aptly put

SIR — The comparison of spontaneous development of life to the creation of a Boeing 747 by a "tornado sweeping through a junkyard", cited by Jukes (see *Nature* 18 February, p.548) as being inept, is, on the contrary, very apt. Probably purposely, but possibly inadvertently, Jukes fails to identify the Wright brothers, Dumont and Blériot as creators. Every additional step in the development of the 747 is a result of creative minds. Without such creative genius, and with or without any number of tornadoes, a junkyard is still junk, albeit with useful materials for creative minds; and without a Creator, atoms and molecules, which He created, are still only atoms and molecules. (Go back farther to matter and energy, if you wish.) In referring to the *creators* of the modern aircraft (those he mentions and their successors), Jukes has most elegantly refuted his own argument.

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## The real dangers

SIR — With regard to the correspondence from Chris Q. Doe (*Nature* 4 March, p.8), I think it is Mr Doe who is demonstrating "extreme ignorance". The statement that "any amount of radiation will produce a proportional increase in mutation rate" is an unproven supposition, and a highly doubtful one in view of recent results on the self-repairing abilities of DNA (of which Mr Doe should be aware if he is really a biologist).

As for the relative dangers of hydroelectric versus nuclear power plants, it is a *fact* that several thousands of people have been killed by collapsing dams during the past twenty years alone, while the number of fatal casualties caused by nuclear power plants can be counted on the fingers, not a single one occurring to people outside the plants (except possibly in accidents due to construction work traffic). The increased mutation rate caused by nuclear plants is, again, highly hypothetical; even if it exists, it cannot amount to more than a fraction of a per cent of the rate caused by natural radiation, itself a small fraction of the rate of mutations occurring spontaneously or caused by chemical agents. Who says that mutations are necessarily harmful, anyway? Darwin would have thought well of them had he known about them.

What science has to do with the soundness of decisions to build nuclear power plants is beyond me; as for the economics of it I leave that to the electric utilities, who presumably aren't building them just for the fun of it. Living in a country which is seeing its forests and lakes rapidly being destroyed by acid rain (already the fish are gone from 10,000 lakes in Sweden, many are practically devoid of life), I have no doubt at all, however, that nuclear power is the environmentally soundest way of producing the energy we cannot do without, and by far the one doing the least harm to nature, both momentary and permanent, and with all aspects considered.

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