CORRESPONDENCE

Majority verdict

SIR — In a recent communication to *Nature* G. G. Simpson writes about a small group of cladists at the American Museum of Natural History that is not representative of the staff as a whole (*Nature* 26 March, p.286). In his view a majority of the staff rejects cladistic or Hennigian procedures. There are 32 professional zoological systematists on the staff here, not including emeriti or honorary staff appointments, and 26 of these use cladistic methods in their systematic work. The small, unrepresentative group referred to by Simpson therefore amounts to 81 per cent of the relevant staff. On the recommendation of three scientific departments, the Council of the Scientific Staff, and the Awards Committee, the trustees of the museum in 1975 gave Willi Hennig its Gold Medal for distinguished contributions to science.

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"I was there"

SIR — Your account (*Nature* April 9, p.435) of a lecture I delivered "at the Rockefeller University in New York last week" raises in me the strong suspicion that your reporter did not hear what I said. This impression is strengthened by the fact that the lecture he reports was actually given in the Cornell University Medical Center.

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Dr Gowans' suspicion is unfounded. Our reporter indeed heard what was said and reported accurately that part of Dr Gowans' talk concerned with the applicability of the Rothchild principle to the financing of medical research in Britain. The Cornell University Medical Center is on the other side of York Avenue in Manhattan from the Rockefeller University, which had advertised the meeting at which Dr Gowans spoke. The two institutions run many joint seminar programmes, but are of course organisationally distinct — Editor, Nature.

Evolution's Waterloo

SIR — While no sensible person could disagree with your position on the "theory of evolution" (*Nature,* 12 March, p.75) I think your arguments are unnecessarily weakened by the sloppy use of words in multiple meanings, enabling your opponents to confuse the issue.

The phrase "theory of evolution" for example, is used in at least two quite different meanings. At one time it means "a record of events in the history of the Earth", at another it means "an explanation of the underlying causes of these events".

The term "metaphysical theory" is another example of this abuse. Popper notwithstanding, a metaphysical theory, *sensu stricto,* is a theory which cannot be verified (or falsified) either now, or ever or anywhere, say the proposition "God exists". The record of historical events, say the proposition "Napoleon lost the battle of Waterloo" is not a metaphysical theory. Although the event cannot be rerun, it certainly can be verified in many different ways. Therefore the "theory of evolution" in its first meaning cannot be called metaphysical, technically or otherwise. An explanation of why Napoleon lost the battle of Waterloo, on the other hand, may or may not be metaphysical, according to whether it is based on verifiable facts or not. An explanation based on the intervention of an army of angels could be called metaphysical; one based on the superiority of the British and Prussian rifles may or may not be true, but it certainly is not metaphysical. The same reasoning holds for the "theory of evolution" in its second meaning.

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SIR — As an American "cladist" and evolutionist concerned with the health of both disciplines and the public reaction to them, I feel that some discussion of the issues raised in *Nature* is warranted.

The issue of creation versus evolution entails two points, neither of which was mentioned in sufficient detail for the public readers of *Nature* properly to understand. First, the real controversy is over whether or not the phemonenon of evolution occurs. It does not concern whether Darwin or anyone else was correct about the mechanisms behind the phenomenon. To imply that a refutation of Darwinism or neo-Darwinism constitutes a refutation of evolution is like implying that a refutation of Newtonism is a refutation of gravitational attraction. Both conclusions would be misconceived. Second, the issue of creationism versus evolution certainly does not rest on whether Karl Popper's particular philosophy of science renders both creationist myths and Darwinian conjectures "untestable." There is a higher principle to resolve this issue.

Science is a discipline of open-minded inquiry which seeks to provide explanations about the world without invoking the supernatural. Creationism as practised by fundamentalist Christians is a close-minded doctrine built around an ultimate source of truth, the Bible. Creationism is dedicated to the proposition that the only explanations about "origins" are the supernatural explanations set forth in their ultimate source of truth. Thus "scientific" creationism, by any standard of rational scientific philosophy, is not science nor can it ever be science. Karl Popper is quite aware of this and has said so in *Conjectures and Refutations.*

Another issue concerns what is being called "cladistics". Scientists who fall under this label have diverse views about the proper relationship between "cladistics" and evolution. As one "out-and-out cladist" I cannot imagine something less interesting than a branching diagram (cladogram) without an evolutionary interpretation. Indeed, I cannot imagine beginning a study of biogeography without such an interpretation. I will even claim that an assumption of descent with modification is necessary to do such analyses. I base my claim on two points.

First, I have never seen a natural hierarchy that was not due to historical descent in the larger sense of the phrase. This includes natural hierarchies in both the organic and inorganic worlds. Examples of natural hierarchies in the organic world are, of course, phylogenies of both organisms and languages, and the hierarchy of ontogeny of individual multicellular organisms. The only example of a natural hierarchy in the inorganic world that I know of is the hierarchy that continents display through descent from common "ancestral" continents. We observe the unfolding of ontogeny; we have detailed histories for the evolution of languages; we have a very good mechanism for the drifting of continents. Are we to think that the only other example of a natural hierarchy, the branching relationships between species, is different in kind from the other three?

Second, the only alternative to the evolutionary interpretation is the assumption of a logical creator who made each species (or group of species, or language, or continent) to look as if it evolved. As I wish to practise science rather than theological metaphysics, I make the assumption of evolution. If I wished to practise theological metaphysics, I would certainly not conceive of a logical creator who was, at the same time, tricky enough to make things look as if they evolved when they did not. I make the assumption of evolution without letting my hypotheses of evolutionary relationships (cladograms to my mind) be dictated by particular theories such as neo-Darwinism. If I let neo-Darwinism dictate *a priori* what relationships were possible then I would be no better than the fundamentalists who let the Bible dictate to them what is possible.

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No to sociobiology

SIR — The recent controversy on genes and racialism (*Nature* 22 January, 12, 19, 26 February) may have some relevance to caste system in India, since it has now assumed a great political significance and is creating social tensions. Although castes are manmade (all Hindus are born unequal!), and the system is nowhere near as old as the human race, yet attempts are often made to establish a biological basis of castism in line with the insect societies. Wilson (in *Sociobiology*) has refuted any genetical basis for caste system, yet willy-nilly, theoretical biology has become a convenient and manipulative tool to disdain or support such social practices.

The problem will become more complex and acute if attempts are continued to biologize every social attribute, be it racialism, castism or nazism. Biologization may be well-intentioned, and it may well prove that some of our beliefs are wrong and unscientific, yet by this process it may generate unnecessary, avoidable controversies and social conflicts. Surely, without biologizing, one can distinguish between races and racialism and between castes and castism. One may dispute or not give a damn if the human race is united or divided, but one can surely condemn racialism or castism without looking for biological evidence or defending the theory of kin selection. Let us keep sociology and biology apart.

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