The case for conservation

SIR — There is stronger case for conservation than that recently argued by Henry Gee (*Nature* **357**, 639; 1992). Gee rightly stresses thinking in terms of systems rather than lists and that "the integrity of the system as a whole transcends the extinction of particular species". But it is for this very reason that it is hard to justify large investments in preserving particular endangered species. In fact a system may not only be preserved but also improved when particular parts are replaced by more efficient ones. This may be what is happening in our own ecosystem as traditional extinction through climatic change and evolution through random mutation and natural selection are being replaced by animal and crop husbandry and genetic engineering.

These trends suggest that Gee may be wrong to suggest that there is a "vested interest of human populations in keeping things very much as they are". In fact, new varieties, such as thriftier cattle and more disease-resistant grains, seem more in our interest than the traditional varieties. And there seem to be some species, such as the human immunodeficiency virus, whose extinction would be much to our advantage. So intelligent, responsible human intervention in evolution seems more in order than is mere conservation.

The problem, however, is that human intervention in evolution may tend to produce varieties that will be increasingly unable to fend for themselves and increasingly dependent upon husbandry. Valerius Geist (*Nature* **357**, 274–276; 1992), for example, has recently pointed out that hybrids of white-tailed and mule deer "suffer from severe deficiencies when it comes to tactics and strategies of predator avoidance".

The more the particular parts of the global system are replaced by varieties that depend on husbandry for their survival, the more the system as a whole may depend upon the intelligence and responsibility of the human species. But humans cannot always be trusted to "have dominion over the Earth" (Genesis, I, 26) in an intelligent and responsible manner. Greed, stupidity, wars and so on often render us unwilling or unable to husband nature for the long-term good either of the system as a whole or of the human species.

Because our intelligence and goodwill are erratic at best, we need the safety mechanism of vast numbers of traditional species and varieties, which do not depend upon husbandry, in order to increase the chances of the whole system's surviving even when we humans are behaving at our worst. This is the objective case for conservation.

Frank J. Leavitt
Jakobovits Center
for Jewish Medical Ethics,
Faculty of Health Sciences,
Ben Gurion University of the Negev,
PO Box 653,
84105 Beer-Sheva, Israel

Anyons

SIR — John Maddox ("Time for tempting Nobel fates" *Nature* **359**, 101; 1992) misspells anyons for 'anions'.

The semantic content of this term, most frequently associated with fractional statistics and anyonic superconductivity, may therefore have been lost on the uninitiated reader.

Stanley Wu-Wei Liu
American Physical Society,
1 Research Road,
PO Box 1000,
Ridge, New York, USA

Too many reviews?

SIR — Have we become review crazy? Suppose one is interested in learning or writing about axogenesis and plasticity in the developing visual system. Using Melvyl, one scans first for keywords in titles back to 1987 and then asks for reviews among those articles. Under plasticity, there are 1,860 articles, 373 of which are reviews, under vision 7,261 articles of which 653 are reviews; synapse 1,000 to 126; axon 3,012 to 192; neurotransmitter 3,642 to 632; LTP 634 to 75; retina 7,416 to 489; neuronal development 2,277 to 340; extracellular matrix 4,764 to 749; neurotrophic 565 to 73; neurobiology 370 to 175; laminin 2,385 to 157. This averages out to nearly 12 reviews for every 100 articles published, or one review for every 8 articles published.

Three aspects of this trouble me. First, in writing a review, political acumen dictates the inclusion of most papers, regardless of quality, even papers for which retractions have been offered. This uniform treatment tends to reduce the impact of quality work and elevate marginal or outdated work. Second, reviews tend to replace the actual articles they review and when referenced lend the impression that the author of the review and not the researchers themselves is responsible for the work. Finally, this whole trend tends to trivialize science into the equivalent of journalistic 'sound bites' — they are becoming the Cliff notes or cribs of the overworked scientist seeking a short cut.

Is this the best response to the overwhelming surge in papers published and the growth of interdisciplinary fields? Have randomly designated researchers become spokespersons for fields by writing reviews, and do those reviews then become the sole source of information? At one time a yearly issue of *Annual Reviews* in a couple of fields would suffice, but now at least a dozen journals have arisen solely devoted to a constant, monthly issuance of reviews (for example *Current Opinions*).

Is quality science and a critical reading of the original literature best achieved through a rear-view mirror? Maybe more thought should be given in the future to both the writing and solicitation of reviews.

Michael J. Ignatius
Department of Molecular and Cell Biology,
University of California, Berkeley,
Berkeley,
California 94720, USA

The welfare state

SIR — Barry Hughes[1] credits me with an aphorism usually attributed to H. L. Mencken. He then proceeds to give simple answers to complex questions. He lists only three variables, including ambient temperature, to which egg production is sensitive (true) and he says these do not have "much impact on welfare". But freezing and excessively high temperatures are both deleterious to animal welfare and to comfort. Other variables that lower egg production include infectious disease, sudden fright, harassment by roosters and parasitism. Hughes says that I argued that "if production reaches some target value which is commercially satisfactory, it demonstrates that welfare also is satisfactory". But I made no such argument: I said that *impaired* production resulted from adversity[2]; and that "production values have been an important adjunct to aiding animal welfare"[3].

Hughes cites his own review of experiments that "demonstrate that egg output of caged hens declines progressively as the number of hens per cage is increased and also as the space per hen is reduced". This supports my statements that egg output is reduced by discomfort, and that "alleviation [of unsatisfactory caging for hens] should be obtainable by improved husbandry". My 'bottom line' was "Farm animals should be treated humanely. Their well-being is necessary for productivity"[2].

Thomas H. Jukes
Department of Integrative Biology,
University of California, Berkeley,
Berkeley,
California 94720, USA

1. Hughes, B. O. *Nature* **359**, 472 (1992).
2. Jukes, T. H. *Nature* **355**, 582 (1992).
3. Jukes, T. H. *Nature* **358**, 186 (1992).