## Footloose managers run away from research

*Sir* — Scientific research within broadly based industrial companies has nearly vanished in recent years. Among the major factors contributing to this decline is the relatively short tenure of high-level industrial managers. Although the effect of tenure has often been mentioned, few quantitative data have appeared. Here I give some well-founded data for one company, General Electric (GE), and limited, less perfect data for IBM and AT&T.

GE annual reports to stockholders list the high-level management (vice-presidents and above) and their positions — typically about one hundred. A chronological sequence of such reports supplies the overall attrition rate of people who are shifted, promoted, hired elsewhere, retired or fired. Half-lives $\tau$ can be found from the starting number $N_o$ and the ending number $N_f$ by assuming that the fractional attrition over each interval of time t is constant ($\tau = t\log_{10}2/(\log_{10}e)\ln(N_o/N_f)$).

Over the years 1981 to 1995, half-lives ranged from 1.5 to 3.4 years, with an average of 2.3 years and a median of 2.1 years. From 1975 to 1977, the two annual values were 1.8 and 2.8 years, based on listings in Standard and Poor's annual *Register of Corporations, Directors, and Executives*. These data are in general less reliable because listings are not necessarily updated annually. Intervals with zero attrition are therefore rejected. Standard and Poor's listings for AT&T (1988, 1989, 1993, 1994 and 1995) and IBM (1989, 1990 and 1991) gave various half-lives between 1 and 3 years — similar to those at GE.

It is unlikely that most managers whose promotion or lack of it will be decided within two years of beginning a job will support research work that can provide useful products or processes only over a longer interval. This mass of high-level management with brief tenure forms a cadre that can be expected to provide continuous pressure toward short-term technological endeavours that will tend to emphasize quick payoffs by short-term engineering and development activities and to discourage expenditures on research aimed at long-range needs and opportunities.

It may appear paradoxical that long-term science ever existed in companies where management tenure is so brief. The answer is that management is hierarchical rather than democratic, and a look at the data shows that the highest management is far more stable than are the next lower layers. In the present case, the GE annual reports show that the 1981 to 1995 half-life of management was 5.1 years for the roughly 30 members at the corporate headquarters, and one person, John F. Welch, has been president throughout (and four previous presidents averaged 9 years in office before retiring).

Given that the chief executive of a corporation can often expect long-term tenure, his or her decisions are likely to reflect needs well into the future. If that person concludes that research will further the future of the company, that activity will flourish even in the face of opposition by the bulk of the less securely placed management. If the chief executive tilts in the opposite direction, there will be ample internal support.

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## One for the fairies?

*Sir* — There is something rather endearing about your second, brief leading article "Avoid financial 'correctness'" (*Nature* **385**, 469; 1997); perhaps its charm and innocence would have been enhanced by an Arthur Rackham illustration in which fairies danced around toadstools?

Is there indeed any "point" in authors of scientific papers declaring their business interests in the topic under discussion, when these authors are upright, thoroughgoing, bona fide scientists, and not just ordinary human beings? Apparently not.

There are, of course, a few case histories on the matter, including those research

specialists who were unable to find a link between smoking on the one hand and lung cancer and heart disease on the other, when those same specialists were paid by disinterested and unbiased tobacco companies; a number of other cases involving drug companies footing the scientific bills for careful and meticulous analysis of their drugs also come to mind.

In many such cases, as I recall, the source of funds, grants and salaries for the scientists to conduct their research was not unduly emphasized, even by the scientists themselves. Cynics might think that a financial interest could conceivably play some role.

It is therefore reassuring to those of us who have spent our lives locked in an attic that *Nature* will have no truck with such base suspicions and "will persist in its stubborn belief that research as we publish it is indeed research, not business", funny, monkey or anybody's.

Remember, every time someone says "Declare business interests", a fairy dies.

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## No Greenpeace 'hijack'

*Sir* — Your leading article "Risk and the inadequacy of science" (*Nature* **385**, 1; 1997) claims that, in the case of Brent Spar, Greenpeace "hijacked" the issue of risk, "making the engineering assessments of risk undertaken by Shell effectively redundant as far as the public were concerned".

This is to misstate our case. In the case of Brent Spar, our main objectives were to prevent a precedent for dumping oil/gas installations at sea and to ensure that industry took responsibility for dealing with the waste it produced.

Although risk was relevant, a conventional risk assessment was an inappropriate tool to resolve the issue, as the main questions to be contested lay outside it. One relevant factor was that of need. We argued that there was no technical engineering need to dump at sea, and this has now been borne out by the fact that Shell has shortlisted 11 options for the future of Brent Spar, none of which involves deep-sea disposal.

The public were right to sense that the framework of decision-making was wrong and redundant. That is not to reject science or engineering assessments: it merely argues for their appropriate use.

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