

## SCOPE and nuclear war

SIR — I suppose it would seem odd to some people that “the nuclear winter subcommittee of the International Council of Scientific Union’s Scientific Committee on Problems of the Environment (SCOPE), which is due to publish its own study next June, should have been able to afford time for a five-day workshop at Bellagio to draft and put out a statement which, on the face of things, will compromise the impartiality of its own work” (*Nature* 20/27 December, p.696). But not to the people who know that the subcommittee did *not* afford time, did *not* draft and did *not* put out the statement.

The official statement indicates explicitly that it was an “*ad hoc* group of scientists and religious leaders . . . gathered at the invitation of ICSU and the Inter-Faith Academy of Peace”. In addition, it should be noted that the group did *not* include Abdus Salam.

The subcommittee, which is concerned with the environmental effects of nuclear war, not specifically “nuclear winter”, is continuing with its studies and meetings. The impartial report of its study will be drafted in June for submission to the SCOPE General Assembly in September.

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## Science spending

SIR — John Maddox is right when he claims (*Nature* 31 January, p.347) that modern “big” physics and astronomy are inevitably expensive, but his idea that we should persuade research communities and governments worldwide deliberately to slow the rate of progress in these fields is remarkably parochial. Many of these other governments, unlike ours, support basic research in an enthusiastic way which suggests that they really do believe their own public statements about its importance. Most of them also spend much smaller fractions of their research and development budgets on secret defence research than us. As a result, our highly productive research scientists work at a relative disadvantage, and the government now demands that these scientists must select those of their own colleagues whose work should be stopped.

A natural reaction to this “divide and rule” proposal is the sad spectacle of a television debate in which an eminent biology professor decries the value of high-energy physics and asks for its funds to be redirected to biology. This type of proposal is appropriate only if we accept that we really cannot afford properly to support

our current basic research programmes. Surely this is incorrect, and we must persuade the government that it is essential both to support CERN and to fund all of the high quality medical research that is now under threat?

John Maddox’s proposal to slow or abandon some work may have some merit, but not in relation to “big” physics or astronomy. Defence spending is much bigger and more futile, and we have now achieved international armories adequate to kill us all many times. Given a choice between new information on the relationships between elementary particles and an “improved” armoury capable of killing us all with even greater certainty, I know which I would ask my government to choose.

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## Star wars

SIR — I wish to correct two errors in your leading article “How to talk about star wars” (*Nature* 3 January, p.1).

You refer to a study by my “committee operating under the flag of the Union of Concerned Scientists in the United States”. In fact, the study that Drs Philip Farley, David Holloway and I performed at Stanford was an independent one and was published by the Stanford University Center for International Security and Arms Control with the title *The Reagan Strategic Defense Initiative: A Technical, Political, and Arms Control Assessment*.

More importantly, in contrast with the statement in your leading article, the size of the constellation and the number of space-based laser battle stations had little to do with the main thrust of our arguments. Although that particular issue has triggered much discussion and controversy in the public press, I believe it to be of only minor significance in analysing the potential and the problems of the Strategic Defense Initiative. As our Stanford analysis emphasized, the issues of primary concern have to do with the strategic political and arms control impact of the star wars programme as originally proposed and with operational problems faced by a fully integrated system operating against an offence that can respond with diverse and effective countermeasures to a defensive deployment. The general conclusion we stated in our report was:

“Our analysis raises grave doubts, on technical and strategic grounds, that substantial acceleration or expansion of ABM [antiballistic missile] research and development is warranted or prudent. Deliberation and restraint are imperative not simply because of the enormous costs of the proposed near-term SDI [Strategic Defense Initiative] research and technology program, but because the strict limitation of ABM deployments is one of the few

points of real agreement reached in the US-Soviet dialogue about nuclear war and arms control. It has practical consequences of great importance for the effectiveness of our deterrent, for such fragile strategic stability as has been achieved, and for our prospects of avoiding nuclear war.

“If defensive systems are to contribute to a safer and more stable strategic relationship between the United States and the Soviet Union, they will have to be embedded in a strict arms control regime that limits offensive systems. Technology alone will not solve the political problem of managing the strategic relationship with the Soviet Union.” SIDNEY D. DRELL  
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## Statistics and philosophy

SIR — George Gale<sup>1</sup> looks for the theory of science to develop from an academic philosophy of science but fails to see statistics bordering philosophy, science and mathematics. Hoping to clarify the nature of probability and its role in logic and science, philosophers have studied theories of probability that are vital to different schools of statistics. That statistics goes beyond probability shows up in the areas statisticians study — from the design of experiments<sup>2</sup> to the weighing of evidence<sup>3</sup> to informal data analysis<sup>4</sup> to what makes a good visual display<sup>5</sup>.

First-rate statistical innovations often result when good statisticians collaborate with scientists<sup>6</sup>. While designing experiments, weighing evidence, analysing data informally and summarizing data with useful displays do not form a theory of science, these individual accomplishments show that statisticians have much to say about the theory and practice of science. Perhaps embattled philosophers of science with an empirical bent can find friends among statisticians. Good philosophers, collaborating with statisticians, might even produce first-rate philosophy.

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1. Gale, G. *Nature* 312, 491 (1984)
2. Fisher, R.A. *The Design of Experiments* (Oliver and Boyd, Edinburgh, 1935).
3. Good, I.J. *Probability and the Weighting of Evidence* (Charles Griffin & Co., London, 1950).
4. Tukey, J.W. *Exploratory Data Analysis* (Addison-Wesley, Reading, Massachusetts, 1977).
5. Cleveland, W.S. *The American Statistician*, 38, 261 and 270 (1984).
6. Box, G.E.P. *Technometrics*, 26, 1 (1984).

## Totals wanted

SIR — Would those who publish a sequence please include the totals of amino acids (or bases).

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