

East-West relations

SIR — That the comments on the deterioration of East-West cooperation in science (*Nature*, 28 June, p.735) came from a political commentator of the Novosti Press Agency, Alexander Sapsai (9 August, p.446), and not, as one might have expected, from a Soviet scientist, is not difficult to explain. All issues of *Nature* which discuss the problems of Soviet science do not reach the libraries in Soviet research institutes, or the Central State Lenin Library in Moscow, or libraries of the Academy of Medical Sciences of the USSR or any other specialized or republican academy in the Soviet Union. More than half of the issues of *Nature* for each year are not listed in the libraries' catalogues, but are kept in "special holdings" where they can be read only by a few scientists with special clearance.

If Alexander Sapsai thinks that it is only US policy which is to blame for poor cooperation in science between the East and the West, I would like him to explain a few disproportions. There were about 2,000 Western biochemists at the 16th FEBS Meeting in Moscow last June, 75 of them from Great Britain. However, there was not a single Soviet biochemist at the 13th FEBS Meeting in Israel in 1980. Certainly the Soviet officials consider Israel as a special case — but these are political reasons, that have nothing in common with the interests of science. There were about 1,000 scientists from the West at the 9th International Gerontological Congress at Kiev in 1972. However, at the 12th International Gerontological Congress in Hamburg in 1981, there was only one Soviet scientist, Professor Dmitry Chebotarev, who is director of the Kiev Institute of Gerontology. All other Soviet gerontologists who applied to participate and were in the programme were unable to attend.

These disproportions I witnessed personally, and I could give many more examples. But that is not necessary. Every Western scientist knows how unpredictable and unreliable is Soviet participation in international congresses, conferences and symposia organized outside the Soviet Union, even in East European countries such as Hungary, Romania, East Germany and Poland. At the recent European Congress of Gerontology in Budapest (1–4 September 1983), only a few Soviet gerontologists were able to take part, fewer than from Poland, Czechoslovakia or Denmark, not to mention France or Britain.

The examples which Alexander Sapsai quotes in support of the Soviet Union's positive attitude to international cooperation in science and technology all involve high-level members of the scientific elite. At the level of younger scientists, the existing restrictions have been introduced by the Soviet side, more recently and

irrationally by legislation. A special decree in August 1982 severely restricted the scientific and other literature which could be sent abroad from the Soviet Union; the postal services were forbidden to accept books for mailing abroad without special permission. A second decree, passed in May 1984, made punishable most unauthorized contacts between Soviet citizens and foreign visitors.

The Andrei Sakharov case makes it absolutely clear that the Soviet Government can keep a prominent scientist silent and incommunicado, and can completely ignore the opinion of the world's scientific community on the matter. Alexander Sapsai was proud to mention that the Soviet Union has 1.5 million research scientists, "25 per cent of the world figure". But how many of those 1.5 million have ever met a foreign colleague, inside the Soviet Union or outside? I once tried to study the real level of Soviet scientific cooperation with scientists in other countries at the level of rank and file young scientists¹. I found that the Soviet record was better than that of only two other countries — Albania and North Korea. ZHORESA MEDVEDEV

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1. Medvedev, Zh.A. *Soviet Science*, (Oxford University Press, 1979).

Science in India

SIR — The trouble with science in India is that it lacks a base. It is not possible to develop science when the whole educational system from the primary school to the university is concerned merely with learning by rote to secure marks in order to pass an examination and secure a job.

Science in India at best satisfies the intellectual curiosity of a small elite, which is itself divorced from the reality of the country and its problems, and which looks to the West for cultural inspiration and kudos. For the vast majority, science is a means of earning a living. In a highly competitive society, this means obtaining the highest possible paper qualification. This explains why India has the third largest number of scientists yet such a meagre scientific output.

The scientific elite also ends up being frustrated because, having been trained in Western countries where the scientific culture is an integral part of society, it finds that very little can be achieved in a country where Western science is not part of the culture. This results in time being wasted in overcoming petty bureaucratic hurdles and delays, by all scientists from those in the Department of Science and Technology to the local head of an institution or depart-

ment and the support and maintenance staff.

A good scientist therefore eventually gives up the struggle and emigrates to the West if the opportunity arises. Failing that, he or she joins the majority whose ambition is to use science to better their social and financial status. These are the future directors and heads of scientific institutes and departments in both the public and the private sector. For them, it is politics and not science that is the path to success. They lend themselves to being manipulated by politicians, bureaucrats and their own seniors. Not much can grow under the shadow of such banyan trees. A hierarchical approach cannot stimulate the young; it only encourages a subservient atmosphere that stifles independence and originality.

It is therefore not surprising that the achievements of Indian science fall far short of what might be expected from the substantial inputs in manpower and finance. There is no shortage of problems for scientific investigation, nor is there anything wrong with the intelligence and originality of our young scientists, for they mature admirably in the West. It is time that India realized that the problem lies not with our scientists but with the infertile soil we have created in which no worthwhile science can grow.

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Miracles

SIR — Dr Sam Berry and others have not invited trouble as surely as the author of the leading article "Miracles do not happen" in *Nature* (19 July, p.171) who takes as his title a statement that Berry *et al.* have shown to be logically unjustified.

As a scientist he can only say, as he rightly does, that since science operates by generalizations of our experience, miracles are by definition excluded from its sphere of enquiry. He cannot therefore logically conclude that they do not occur: this is a statement of faith, or a personal opinion based on atheistic belief. The claim that "miracles do not occur" is as unjustified in a scientific context as the claim that "evolution does not occur" is in a theological context.

I believe that evolution has occurred — this is a scientific belief based on appropriate evidence, and the subject is outside the bounds of proper theological study.

I believe that miracles have occurred — this is a religious belief based on appropriate evidence, and the subject is outside the bounds of proper scientific enquiry.

Overstepping the bounds of science to argue against miracles is in my view as mistaken as unduly extending biblical authority to support arguments against evolution.

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