

Letters

Third World energy

Some of Ziauddin Sardar's complaints ("Why the Third World needs nuclear power", 12 February, p 402) about the hypocrisy of developed countries in nuclear technology transfer and "vertical" proliferation are clearly justified. Such complaints legitimately apply to many other technologies transferred, or not, to the Third World from developed countries. However, his article contains some odd logic about the role of nuclear power as Pakistan's energy saviour, and some even more curious facts.

To start with: KANUPP nuclear power station is said to have been available for 74 per cent of the time in the past four years. Even if true, which seems doubtful, this is irrelevant and misleading. The most important measure of reactor performance is load factor, which tells us how much power has been produced as a proportion of maximum possible output. Over the past four years KANUPP has averaged a 15.6 per cent load factor, and has managed just 5.5 per cent in the past two years (up to December 1980). Consequently KANUPP displaces less than 2 per cent of Pakistan's oil consumption.

Sardar then tells us that CHASNUPP, the planned 600-MW reactor, will be completed in 1983, although no construction has yet started and no suppliers have been announced. This would mean a maximum construction time of two-and-a-half years against a world industry average of eight years. Given that Pakistan will "virtually go it

alone" on CHASNUPP, it will be extremely lucky to complete a second reactor during the 1980s.

This brings us to the relationship between oil and nuclear power. "By 1985 we would have to spend 100 per cent of our export earnings [on oil] if we did not have nuclear power." The fact is that by 1985 Pakistan is almost certain not to have any more nuclear power than the desperately small reliable capacity that it currently possesses. Consequently, the foreign exchange crisis, predicated on the absence of nuclear power, is likely if present policies persist. This does not mean, however, that Pakistan has no other energy options, as Sardar implies.

Apart from the fact that hydro potential is not yet fully tapped, Pakistan is a substantial natural gas producer. In 1978, domestic natural gas contributed around 48 per cent of all primary energy consumption, while nuclear power contributed under 1 per cent. Gas can also displace oil in all non-transport uses—not just in electricity production. If CHASNUPP is no more expensive than typical Western reactors, it will cost around £600 million: an equivalent investment in natural gas would be likely to displace a good deal more oil, and more rapidly too.

Gordon Mackerron Brighton

Evolving idea

I read with interest Colin Tudge's article, "Lamarck lives—in the immune system" (19 February, p 483). If Lamarckism does occur in

nature is it not more likely that it has been evolved by natural selection?

For example, perhaps creatures which have a Lamarckian aspect to their immune system stand a better chance of survival than those that do not and hence are favoured by natural selection. Surely nature must first evolve a creature sufficiently complicated to require an immune system, then evolve the immune system itself, and only then remodel it along Lamarckian lines if this is found to be more efficient.

Ian Crawford Warrington

Transport consultant

I read with interest Ian Heggie's defence of his famous letter, in *New Scientist* (5 March, p 637). I am a permanent Civil Servant with a somewhat similar advisory role to that held by Heggie at the time of the letter. Had I written such a letter to consultants or contractors with whom my department did business, no amount of further "continuing dialogue", or "subsequent letters", could possibly have excused such an explicit and blatant piece of attempted pressure.

I am amazed that Heggie can suggest that a "private letter" may be typed on government stationery by government secretarial staff in government time, and no doubt despatched with the government's postal frank.

It may be, of course, that Heggie's command of English is less than one would expect from a ministerial adviser. (I am not sure how an article which has done "nothing but harm" can have had "some

small compensations".) If so, someone should gently but firmly explain to Heggie just what was wrong in his writing and despatching of the letter in question.

J. Stoneman East Horsley

Concertina

How regrettable, in this difficult time for our native arts and industries alike, to find Ariadne deriding (5 March, p 656) that most consummately and endearingly British of all instruments, the concertina. I can think of no more charming monument to British enterprise than Lea Nicholson's recent recording of the entire *Fourth Brandenburg Concerto* scored for massed concertinas. The concertina is an enduring symbol of Empire, a claim which frankly cannot be advanced for Sir Charles's other inventions like the pseudoscope or the Wheatstone bridge. Ariadne is naturally at liberty to belittle our national heritage, but the gibe "a wheezy instrument" comes strangely from a daughter of the race that gave the world the aulos and the syrinx.

Nick Lowe Cambridge

Science books

Your readers might gain the impression from "Successful bookmaking" (Comment, 5 March, p 586) that Oxford University Press is not substantially involved in academic science publishing. Our current turnover of more than £2.5 million a year on books and journals in science and medicine and the publication of 100 new titles in the past year are an indication that we are already heavily