

# correspondence

## Rothschild: an antidote to panic

SIR.—There are a number of inaccuracies or misrepresentations, doubtless unintentional, in the leading article (30.11.78) on my Dimpleby Lecture. I shall give a few examples:

● "Lord Rothschild . . . argued that we should develop a table of risks so that we could compare, say, the risk of our dying in an automobile accident with the risk of Baader-Meinhoff guerillas taking over (sic) the nuclear reactor next door." I specifically said that the risk of such a terrorist gang gaining entry to a nuclear power station was secret and *therefore unknown*.

● The leader claims I implied that viewers could not convert "probabilities from one form to another". The reverse is the case as evidenced by the visual example given, actually on a pocket calculator which was seen by the audience. The example was  $109 \div 109 = 1$ ;  $1,000,000 \div 109 = 9,200$ . (Must I say, in *Nature*, that  $1,000,000 \div 109 = 9,174.3119$ ?)

● I was said not to have quoted "a single error on the risks I enumerated". The reason was quite simple: the BBC did not like references to confidence limits or intervals, although I spent some time in the lecture on the importance of what I call "tolerances". In addition, I said that "1 in 100 is not exactly 1 in 100 in the world of risks, but, for example, *probably* somewhere between 1 in 95 and 1 in 105." If you had bothered to look at the printed version of the Dimpleby Lecture which was obtainable on 24 November, the day after the lecture was broadcast, you would have found references to confidence limits under six of the seven tables in the lecture. Ranges were given in the other one, Table 6. There are other misrepresentations which I did not expect in an editorial in *Nature*.

What is more important is that your leader-writer has failed to understand the *constraints* imposed by talking about a highly complex and technical subject to 5 million people, the overwhelming majority of whom are laymen, in contradistinction to the few thousand who read *Nature*; and the *restraints* imposed by the BBC with their undoubted expertise.

I fear I am not competent to give a lecture on "the democracy of risk assessment", whatever you mean by that phrase. Let us hope your leader writer will soon give it, if only so that we know what it is.

As stated in the last but one paragraph of the lecture (p. 19), two of its main objects were to induce people to think about risks "for a minute or two", and "to compare the different risks around us." If I may quote myself in conclusion (p. 3): "Comparisons, far from being odious, are the best antidote to panic." In the editor's case the panic appears to be about the use of numbers.

ROTHSCHILD

N. M. Rothschild & Sons Ltd,  
New Court, St Swithin's Lane, EC4

SIR.—In your forceful editorial, you assert that the quantitative assessment of risks is not enough and that emotional reactions also deserve a role in decision-making. True, and indeed we live in a society where emotion is hardly likely to be under-represented in political decision-making. But emotional reactions are not necessarily and automatically decisive, and surely Lord Rothschild was merely concerned to get across the fact that such a thing as risk calculation exists and that *it* deserves a part in decision-making too. Many non-scientists don't know how risks are calculated, especially on an *a priori* basis; is it arrogant to draw attention to the fact that such calculations *can* be made?

One of the most intractable problems in the discussion of nuclear power (and genetic experiments, *et hoc genus omne*) is that the expert is the victim of a classic catch-22: he can only acquire expertise of certain kinds, it is implied, by working in the industry or science that is under attack, and that, it is asserted, automatically destroys his objectivity (and the non-objective cannot be a real expert). But if emotional bias is to be automatically presumed in the expert, then how is the undoubted emotional bias of the external attackers (*ex hypothesi*, they cannot be experts!) to be assessed? Does not that bias nullify the validity of the attack? In this connection it should be remembered that a recent public survey in Britain elicited the fact that a large majority of the public prefers to trust the technical judgment of the experts on nuclear power, intellectual prostitutes though they apparently are.

Emotional reaction to such things as nuclear reactors is a slippery basis for decision-making. I don't much like paying taxes, but I would hesitate to put that consideration too far ahead of dull calculations about the need to pay old age pensions somehow. How is allowance to be made for the fact that fears can be whipped up for reasons which quite often are largely political? Is it to be accepted that certain forms of risk are psychologically intolerable however small they are, for inscrutable reasons, whereas others are cheerfully accepted even though not negligible? For instance, it is notable that there are no public attacks on the transport of liquefied natural gas. Rothschild quoted figures implying that this process is even safer than nuclear power, yet a large LNG carrier bears explosive power equivalent to an atomic bomb. Though the LNG disaster involving a lorry in Spain indicates the destructive power of the fuel, the fact that no ship has blown up yet should not (on the analogy of the arguments applied to nuclear power) assuage the fears of those who live in harbour-towns where such ships are unloaded. Why not? Could it be that such an attack would be politically embarrassing because most LNG comes from the Third World?

Even if, for argument's sake, one postulates that no one working in the nuclear energy industry is to be trusted to give an honest opinion on contentious matters, it remains true that there exists a distinct group of experts, such as nuclear inspectors and medical radiation specialists, who can cast a cool and independent eye over some of the issues in dispute. For instance, Sir Edward Pochin, who is a medical professor, recently gave a lecture entitled "Why be Quantitative about Radiation Risk Estimates?" (National Council on Radiation Protection and Measurements, Washington, D.C., Lauriston Taylor Lecture No. 2, 1978). He makes a number of points in the special field of medical radiation protection which are very reminiscent of Lord Rothschild's and in the last part of his lecture he puts together some risk calculations from the UN, OECD, the International Commission on Radiological Protection, the US National Safety Council and the like (all, one would think, immaculately independent bodies) and concludes that the death risk from the total radiation exposure, from the entire uranium cycle, for an average citizen (including 'nuclear workers' in the average), in a country where one kilowatt electrical power per citizen comes from nuclear stations, is equivalent to the death risk from smoking one cigarette every two years. He adds that he recognises that relative acceptabilities of the two risks is another matter, but believes that "the numerical comparisons of this type do have a certain value in letting radiation be seen in a proper context as one of the numerous potentially harmful components of the occupational, as of the general, environment. . . ." The essential answer to your objection to Lord Rothschild's lecture, surely, is that it can only be beneficial to have context.

Two other brief points should be made about your editorial. Firstly, you point out the special difficulty of assessing 'unknown risks'—risks of something that has never yet happened, like a serious reactor accident, or a major LNG ship disaster. But surely it is a very odd attitude to treat, by implication, something so safe that it has never yet gone seriously wrong over a period of years, as more suspect (merely because no *historical* risk estimate is feasible) than, say, coal-mining or deep-sea fishing? This implies that the more successful an industry is in minimising fatalities (and the nuclear power industry has, to date, a unique record), the larger the part that emotion (as distinct from facts) should play in assessing its desirability. Odd!

Finally: you make the intrinsically very powerful point that one cannot quantify the risk of the loss of some civil liberties if nuclear power expands, or, for that matter, quantify the emotional reaction to that eventuality. But who shall assess the risk of major social disorder occasioned by very serious energy shortages in future if nuclear power is stopped, and what numerical value would such a disamenity carry?