In criticizing the Environmental Protection Agency's (EPA's) proposed implementation of the 1988 Indoor Radon Abatement Act, Abelson seems to ignore the fact that the EPA's response is in full accord with repeated recommendations by prestigious scientific panels. These panels have stated in unmistakable terms that, for purposes of establishing public policy, it is prudent to assume that any incremental exposure to ionizing radiation is potentially harmful to human health. The regulatory structure growing out of these largely uncontested recommendations includes "as low as reasonably achievable" criteria that require industry to reduce public exposure to ionizing radiation whenever the cost is less than $1000 per avoided person-rem. The associated cost to society is on the order of $2 million per imputed life saved. And in contexts such as the sealing up of uranium tailing piles to prevent the escape of radon, cleaning up radioactive contamination in defense establishments, redesigning or abandoning nuclear power plants to reduce the consequences of hypothesized accidents, and establishing criteria for the management of low- and high-level radioactive wastes the cost per imputed life saved is enormously greater.

The estimated cost of $10,000 per home to achieve the objectives of the Indoor Radon Abatement Act is thus well within the range of costs now being incurred by society to remediate small imputed risks to the public. Furthermore, despite remaining scientific uncertainties, the possibility of an actual risk to the public from indoor radon is considerably less far fetched than the possibility of significant risks from other imputed hazards that have occasioned great public alarm. In this sense the EPA is to be commended for seeking to reduce the egregious inconsistencies between indoor radon guidelines and the far more strict regulatory mandates for dealing with other sources of potential public exposure to radiation.

Nevertheless, Abelson's contention that national priorities should focus on the elimination of large, well-documented risks rather than on the remediation of small conjectured risks seems entirely reasonable. But the scientific community itself has tended to be tolerant of those members who cater to rampant public misconceptions concerning the magnitude and plausibility of a large variety of hypothesized risks. It is therefore to be hoped that the indoor radon problem will dramatize the urgent need for the scientific community to become more actively involved in seeking to establish a rational and consistent national attitude toward dealing with the increasingly expensive problem of risk aversion.

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Abelson correctly points out the uncertainties about the health effects of radon. Equal uncertainties (largely due to a lack of information) surround the availability of methods for correcting this problem. Because the solid airborne decay products of radon are electrically charged, simply circulating the air within a room (by using, for example, an overhead ceiling fan) will reduce their concentrations through plate-out by 50 to 60%. Since the decay products are not a health hazard external to the body, this represents an effective method of control. If a positive ion generator is combined with the fan, reductions of 90 to 95% are readily accomplished. Although it may require upward of $10,000 to correct the problem in homes with high radon concentrations, corrective action in the vast majority of homes can be accomplished for only a few hundred dollars.

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Abelson's editorial discusses the uncertainties about health effects from exposure to low levels of radon and criticizes the Environmental Protection Agency (EPA) for taking action before these uncertainties are cleared up. The editorial does not, however, point out that these same uncertainties apply at least equally to *all* low level radiation, including that from (i) radioactive waste, (ii) reactor accidents (more than 95% of all health effects are due to *low* level radiation), (iii) bomb test fallout, and (iv) diagnostic x-rays, and we are certainly acting on those. In fact, we are spending several billion dollars a year protecting the public from them, 100 times what is spent in the public and private sectors combined on protection from radon; whereas the radiation exposure the average American receives from radon is a thousand times more than he or she can ever expect to get from items (i) and (ii), 100 times more than from (iii), and 10 times more than from (iv).

Clearly, programs for reducing exposure to radon are many orders of magnitude more cost effective. Confirming this, my analyses (*1*) indicate that the cost per life saved with present programs is roughly $200,000 for protection from radon, $200 million for protection from radioactive waste, and $2 billion in protection from reactor accidents.

Science has published many pieces about the problems and dangers from radioactive waste and reactor accidents, thus contributing to public concern about them. How then can it now complain about EPA contributing to concern about radon? Why pick on radon?

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REFERENCES

1. B. L. Cohen, *Health Phy. Soc. Newsl.* **19**, 5 (January 1991).

Ubiquitous Neuroscientists

The *Science* cover of 4 January suggests that someone has tested the Gaia hypothesis by patch-clamping the troposphere. I am eager to know how they obtained a gigaohm seal that large. I am also concerned that they do not attempt to excise the patch; that might put a hole in the ozone layer!

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Erratum: In the title of the report "ACh receptor–rich membrane domains organized in fibroblasts by recombinant 43-kilodalton protein" by W. J. Phillips *et al.* (1 Feb., p. 568), the word "kilodalton" was misspelled.