interest in public health, but especially for public health practitioners, scientist-advocates, and policy makers.

Dr. Lanphear is Associate Professor of Pediatrics, Children's Hospital Medical Center, Cincinnati, OH.

Address correspondence to: Bruce Lanphear, MD, MPH, Children's Hospital Medical Center, 3333 Burnet Ave., Cincinnati, OH 45229; tel. 513-636-3729; fax 513-636-4402; e-mail <bruce.lanphear@chmcc.org>.

Making Better Environmental Decisions
Mary O'Brien
Cambridge: MIT Press, 2000.
283 pages; $22.95 (paper)

Ellen Silbergeld, PhD

We are all precautionary now, to paraphrase the famous comment about Keynesian economics. As a consequence, it may be that the precautionary principle is in danger of death by overacceptance. After a first wave of reaction characterized by suspicion and dismay, all sides in the deeply divided national discourse on environmental policy have vigorously professed allegiance to precaution. One reason for this remarkable unanimity of purpose is that no one really knows what the precautionary principle means in practice. Despite a spate of books and articles over the past five years, invocations of its successful applications in European policy, and its inclusion by reference in several international agreements, an operational definition of the precautionary principle remains elusive. As stated, the precautionary principle appears to embody a simple notion of prudence or foresight: "When an activity raises threats of harm to human health or the environment, precautionary measures should be taken even if some cause and effect relationships are not fully established scientifically."[1] What this actually means is less easy to put into practice.

On the evidence of Mary O'Brien's book, *Making Better Environmental Decisions,* and last year's important set of essays collected by Raffensperger and Tichner,[1] the precautionary principle may in fact have two different meanings. In the context of regulating toxic chemicals, where it takes action to overcome an entrenched assumption of safety, precaution has been invoked to encourage an incentive or even an obligation to act in the absence of scientific certainty. In the context of siting a controversial new facility or operation, where a new action is proposed, precaution is invoked to justify opposing actions that have the potential to cause unwanted ecological or health impacts. Thus, in one context, precaution is associated with activism, and in the other context with resistance to action. In the former context, uncertainty is not a bar to action to reduce or ban an unacceptable pesticide or chemical process; in the latter context, uncertainty is a disadvantage as regards siting a new facility or licensing a new product.

Clearly, the second meaning of precaution is easier to understand, and closer to the common sense statement of precaution: look before you leap. This is the main thrust of O'Brien's book. O'Brien has a distinguished record as an environmental advocate working with local, regional, and national nongovernmental organizations. She brings to her book the passion of experience and a deep respect for the values and rights of ordinary citizens working as individuals or in small groups around the local, but not so ordinary, matters of community life: Who will clean up the local dumpsite? Where will the hazardous waste facility be? How will regional ecosystems be protected? Her determination to challenge the hegemony of risk assessment arises from the same commitment to democratic empowerment expressed nearly 20 years ago by William Ruckelshaus. In an important essay, Ruckelshaus warned that the increasing reliance upon risk assessment, which he recognized as a technically complex and data-driven policy method, carried dangers not only to the process of transparent environmental policy-making but also to the Jeffersonian ideal of participatory democracy and enlightened self-government.[2] O'Brien adds to his political critique of risk assessment her objection to its narrowness of focus upon the scientifically quantifiable, "using certain bits of information in such a way as to exclude feeling and to artificially sever connections of parts to a whole." As does Sandra Steingraber in her more personal reflections on environmental policy (*Living Downstream*),[3] she calls for reducing the preeminence given to technical/scientific/economic analyses of options to a scale commensurate with the cultural, social, religious, and emotional contexts of people's lives.

The passion of O'Brien's writing is persuasive, and her examples of environmental policymaking make a strong case for reintroducing human perspectives into agencies seemingly staffed by anomic robots. She characterizes with particular accuracy the insensitivity of much of the risk assessment related to hazardous waste site cleanups. I, too, have been present at meetings

where exasperated residents, faced with unintelligible risk assessments, try to elicit from bureaucrats and industry representatives a straightforward answer to the simple question: "Would you and your family live here?"

Unfortunately, risk assessment will not go away so easily. O'Brien argues for replacing risk assessment with what she calls alternatives assessment, citing fundamental principles. The first two principles state that it should be unacceptable to harm people or nonhuman species when there are "reasonable alternatives." But what is "harm?" What is "reasonable?" It is on such simple words as these that the whole complex structure of risk assessment was built. In fact, the basic premise of "alternative assessment" is stated as follows: "The only way we will cause the least damage is to consider options for causing the least damage and the greatest benefits." How is one to estimate degrees of damage to determine which course causes the least damage? How does one determine benefits? This sounds dangerously like the territory of comparative risk assessment to this reader. The difficulties in devising programs for "green labeling" underscore the challenge of operationalizing the concept of alternatives assessment. In fact, the debate over which is "greener,"—cloth or disposable diapers—exemplifies the difficulties in analyzing alternatives. O'Brien's criticism of risk assessment as being necessarily incomplete would apply at least as well to assessment of alternatives, and it runs the risk of supporting the position that, since knowledge of any hazard is incomplete, then no knowledge is useful.

O'Brien's third principle states that no one can define acceptability of damage for anyone else. She invokes the ethical argument for zero risk, on the grounds that accepting any risk greater than zero is morally equivalent to accepting that some person, somewhere, will be harmed. This gives more credibility to the output of quantitative risk assessment than is wise. "Risks" in risk assessment are not the same as "risks" in epidemiology, which are embedded in a context of real populations living multifactorial lives. Moreover, we accept measurable risks all the time for ourselves and we impose nonzero risks on others by our own choices of the cars we drive, the houses we build, and the foods we consume. There is a subjectivity in O'Brien's argument for this principle that is at least as dangerous to communitarianism as is the imposition of armies of incomprehensible risk assessors. Suppose I determine that vaccination of my children carries a nonzero risk of serious disease and possibly even death; I therefore decide not to vaccinate them. Yet my decision imposes risks on them and on others outside my family by increasing the size of the pathogen reservoir. Suppose I decide that the levels of chlorination byproducts in my drinking water impose a nonzero risk that I do not want; if I succeed in preventing chlorination of a drinking water system that anyone else uses, I impose a nonzero risk of harm from microbiological exposures.

The problem is that O'Brien's suggestions reflect the same elitism that tarnished Judge Breyer's proposals for solving environmental deadlock in *Breaking the Vicious Circle*.[4] In his book, Breyer advocated the establishment of permanent cadres of experts with powers to overrule politically appointed heads of existing agencies, and possibly Congress itself, in analyzing and reaching decisions on complex issues of risk, such as pesticide regulation and hazardous waste clean up. Breyer reached this recommendation out of exasperation with the delays and inconsistencies of populist decision making, especially in complex matters––the same fear that motivated the Daubert decision.

O'Brien shares Breyer's nightmare, only she fears the usurpation of power by a technical elite, which causes her to advocate the empowerment of locally based citizen groups with the authority to override experts' authority in order to make decisions that "feel good"—that respect the relevant values of the community. Neither Breyer nor O'Brien seem to acknowledge the possibility—in reality, the inevitability—that their chosen few can make mistakes. Breyer never dealt with the problem of experts making terrible errors of judgment, as the French health service did in refusing to license a US method for HIV testing of blood, as the British government did in refusing to consider information on the health risks of mad cow disease, or as the US Public Health Service did in concealing the truth from subjects in the Tuskegee syphilis study. And O'Brien does not acknowledge the problem of local communities that challenge sound environmental policy—citizen groups in favor of logging the habitat of endangered birds, or Native American councils voting to invite a facility for radioactive waste, or a West Virginia town turning out to support its chemical industry, or the population of the Faeroe Islands asserting a cultural right to continue whaling. The current practice of risk assessment certainly contains a tension between democratic and oligarchic decision making, but this is not resolved by replacing the decision makers with a purportedly expert scientific elite or with a purportedly authentic council of community elders. Environmental decisions are often unpopular—sometimes with the economic and political powers of a

society, and sometimes with communities of workers, residents, hunters, and consumers.

Environmental decision making is too important to leave to any group, expert or lay. We cannot escape the burden of trying to incorporate what we know into what we feel, to find a common path to deciding what is harmful, what is good, and, finally, how we can accept the necessary compromises among all our goals. Does this mean that the precautionary principle adds nothing to environmental policy? Certainly it serves as a reminder of the biases inherent in our present system, where chemicals are assumed safe until demonstrated to be hazardous and where uncertainties almost always redound to the benefit of polluters. However, without more rigorous methods, the precautionary principle is unlikely to displace risk assessment, although it may usefully change the context in which risk assessments are done and communicated.

REFERENCES

1. Raffensperger CA, Tichner J. Protecting public health and the environment. Washington (DC): Island Press; 1999.
2. Ruckelshaus W. Risk, science and democracy. Issues Science Technology 1985;1:19–38.
3. Steingraber S. Living downstream. New York (NY): Vintage Books; 1999.
4. Breyer, S. Breaking the vicious circle. Cambridge (MA): Harvard University Press; 1993.

Dr. Silbergeld is Professor of Epidemiology and Toxicology, University of Maryland Medical School, and Consultant Toxicologist to Environmental Defense.

Address correspondence to: Ellen Silbergeld, PhD, University of Maryland Medical School, Department of Epidemiology and Preventive Medicine, Baltimore, MD 21201; tel. 410-706-8707; fax 410-706-0727; e-mail <esilbergeld@epi.umaryland.edu>.