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Being a scientist means taking sides

by Mary H. O'Brien

Once you are a scientist, which means as soon as you systematically ask questions about the universe, you take a political side. There are infinite questions that you could ask about the universe, but as only one scientist, you must necessarily choose to ask only certain questions. Asking certain questions means not asking other questions, and this decision has implications for society, for the environment, and for the future. The decision to ask any question, therefore, is necessarily a value-laden, social, political decision as well as a scientific decision. Let me give just two examples.

Salmon ethics

A few years ago, on the Oregon coast, I attended a meeting of a Northwest chapter of the American Fisheries Society. The major topic being debated on these two days was, interestingly, ethics. The major example being used to discuss ethics was one close at hand: whether the American Fisheries Society should petition the US Fish and Wildlife Service to list numerous salmon runs as endangered. To petition for the listings would mean entering into controversies that were already raging over dams, power generation, timber practices, and grazing practices.

The scientists at the meeting discussed the harm that could be done to the public perception of them as objective research scientists if they petitioned for the listings. They were all aware that petitioning for the listings meant they were taking a position in the controversies. But, interestingly, there was also general agreement, in the context of ethics, that they would also be taking a side if they did not petition. They would be taking the side of the status quo: business as usual, standard dam practices, maximal power generation, standard timber practices, standard grazing practices, and continued salmon extinction. There was no way for these scientists, as a group, not to take a side.

Risk assessment versus alternatives assessment

A second example describes the actions of individuals. There are many scientists who undertake research and analyze data to produce risk assessments: of the cancer risk of dioxin in the food chain; of the health risks to local residents of burning hazardous waste in cement kilns; of the risks to a fishery of taking out one-third of the trees, or of grazing cattle, in a particular watershed; and of the minimal viable population of grizzly bears and their minimal habitat area.

These scientists may think that their role is to be objective, to not take sides, to provide excellent information so that whatever decision making takes place is informed. And, if decisions are made that seem to ignore the scientific information, the scientists will at least have done their part conscientiously.

By diligently preparing and analyzing data for risk assessments, however, these scientists are participating in the process of assimilative capacity assessments and policy making rather than alternatives assessments. Assimilative capacity assessments ask, How much dioxin is safe in the milk of an infant's mother? How much hazardous waste can be burned without raising the cancer risk to nearby residents by more than one in a million, or one in a hundred thousand, or perhaps one in ten thousand? How many trees can be cut or cattle grazed without putting a salmon run at peril? How much grizzly bear habitat can be destroyed without losing the grizzly bears?

But pouring scientific skills, agency energy, and public money into these risk assessments generally does not serve the infants, residents, workers, Chinook salmon, or grizzly bear nearly as well as alternatives assessments. One could ask instead, What alternatives do we have to the industrial use of chlorine, which results in the placement of dioxin in an unborn embryo's tissues? What alternatives are available to reduce toxics use and generation of hazardous wastes and eliminate the making of cement by burning solvents and other toxics? What social and production alternatives do we have to cutting the last of our ancient forests? What is the least habitat we can take away from a species in trouble? What options do we have for removing our presence from damaged areas to restore ecosystems? What are our options for reducing human numbers?

I contend that, in general, to ask risk-assessment questions rather than alternatives-assessment questions is to contribute to the currently dominant, but suicidal, assimilative capacity approach and practices of our society. Many industry associations adopt the assimilative-capacity approach, because the questions asked support extractive and polluting activities. These questions include, How much can we expose people to certain compounds without killing them, making them sick, reducing their intelligence or reproduction, or damaging their immune system? How much can we do to Earth's ecosystems without making them buckle? The alternatives assessment approach, on the other hand, asks, What is the least we can get away with doing to Earth? How can we best institute precautionary behaviors?

Many thousands of scientists are actively assisting the assimilative-capacity paradigm by painstakingly gath-

ering reproducible data for risk assessments. I urge these scientists to track the uses that are being made of their data and ask themselves whether they approve of those uses and whether, as a result of those uses, life is being protected or silently drained away.

Questions about questions

It is an interesting exercise to examine the questions you are pursuing as a scientist. Who wants me to be looking at certain kinds of questions, and why? Whose questions am I ignoring? Who is being hurt on Earth, and whom am I trying to save? The murrelet? Mink in the Columbia River? Asthmatic children in inner cities? Mexican workers in border-town factories? The forests? The ozone layer? Farm workers? Groundwater? Biodiversity? No one?

The political maelstrom

Do you, as a scientist, consider the great political battles swirling about the scientific research (or lack of information) involved in environmental and public health issues? All environmental problems and all public health problems are inherently political, because it is humans that are causing the problems, and they could be behaving in a more environmentally protective manner.

Some scientists, often with great personal courage, consciously join their science to the public, political processes that must take place in a democracy to address any environmental or public health problem. With the best available evidence, they pursue the scientific questions embedded within political explosions and they articulate the significance of that evidence.

There is no question that it is a help when you, as a scientist within a university or other setting, undertake research to address some scientific question relevant to environmental issues. You can always hope that those who work to improve humans' behavior toward Earth will find, read, understand, and use your painstakingly gathered information.

However, you can also choose to face reality as to who is really reading and understanding your research and that produced by others. If you do so, you will surely admit that sometimes to help the environment and public health you must publicly interpret your research and the research of others; testify at a public hearing; prepare an affidavit for an environmental lawsuit; respond to citizen activists who ask questions when you would rather be doing your research; attend environmental conferences to learn what happens to science and scientists in the world of politics; join and provide leadership in a citizen group (remembering that citizen groups include scientist, engineers, and lawyers as well as loggers, parents, artists, and ranchers).

Being a scientist should not preclude you from also acting as a scientifically knowledgeable, active citizen in controversial democratic processes. From whose ranks should citizen activists be drawn if not from scientists'?

Jerry Poje, a toxicologist with the National Institute of Environmental Health Sciences, recalls the time he attended a public hearing on health effects of a Superfund site in Ohio. At the time, he was teaching environmental toxicology at Miami State University. He went to the hearing to listen to how state agency scientists would explain their health effects research to the public. At the hearing, however, the State Department of Environmental Health scientists were basically telling their audience of mostly indigent Appalachians that the Superfund site was not a health threat. Their main evidence for this assurance was a 48-hour mutagenicity assay on soil samples near the site. They pointed out that a similar assay on soil outside the State Department of Environmental Health building had been more highly mutagenic than this soil sample.

Other agency scientists, from the US Environmental Protection Agency, the Ohio Environmental Protection Agency, and the federal Agency for Toxic Substances and Disease Registry, were present at the hearing, but none were challenging this claim. None were explaining the limitations of the Ames mutagenicity test to predict health effects that could be caused by residence near this Superfund site. None were urging caution.

Although Poje originally had not intended to speak at the hearing, he eventually stood up and explained why the Ames assay results were insufficient to allay concerns about the potential health effects of the Superfund site. Citizen groups who were trying to raise issues of concern regarding the site came up to him afterward and asked if he would continue to help them.

It is eye-opening for a scientist to participate in the public political processes of our country that surround environmental and public health issues. However, even if you choose not to participate, you are taking a side.

Acting in the public interest

There are numerous, essential ways that you as a scientist can act in the public interest. I define *acting in the public interest* as participating in those processes that promote environmental integrity, biological diversity, public health, and democracy.

Work with a public-interest group. Engage in extended conversations with citizen groups, activists, and public-interest environmental lawyers. Attend some of their conferences, learn about the critical problems, and be available to answer questions. You may find out about political barriers, suppressed documents, gagged scientists, unanswered questions, threatened firings or relocations, and defiance of environmental laws by government bureaucrats and corporations. Work with citizen groups in a mutual relationship: you can inform their ignorance, and they can inform yours.

Do relevant projects. If you teach, encourage your students to undertake class projects, theses, and dissertations in conjunction with citizen groups. Introduce the students to the intellectual excitement and personal relevance of addressing public-interest concerns. Undertake such research yourself. Neither you nor your students lose your scientific objectivity simply because you are pursuing a question that the Hells Canyon Preservation Council or Pesticide Action Network has raised. You only lose your scientific objectivity if you do not follow scientific procedures. Or, as Ralph Lightstone of California Rural Legal Assistance states, "You

only lose your objectivity if you lose your objectivity."[1]

Serve on a local, state, or national committee or task force. But do not use your scientific status and clout to distance yourself from citizen activists. Governmental, scientific, and industry representatives on committees may imply that, although the public's values may have to be taken into account during decision making, the only information that is to be considered is that generated by professionals: government and industry scientists and bureaucrats.

You, on the other hand, must be an advocate for citizens and the knowledge they have—persons with firsthand knowledge of the cumulative effects of toxics; persons who possess documents that have been leaked to them by government and industry scientists and bureaucrats; persons who have pored through numbers in documents and have correctly come to conclusions that challenge the official conclusions; and persons who have gained scientific literacy either through formal education or the channels provided by citizen organizations and public-interest scientists.

You must insist that the public be included in decision making; that they have access to all available information; and that they have access to courts to enforce their country's laws. Public-interest science flourishes only in a functioning democracy, and public-interest scientists must force a democracy to function.

Devote a minimum of 10% of your time and 10% of your money to activism. Time does not substitute for your money, and money does not substitute for your time.

Vic Sher, a public-interest environmental attorney with the Sierra Club Legal Defense Fund in Seattle, Washington, told me this year of the fund's inability to gain the testimony and assistance of a scientist critical to a suit that seeks to halt dioxin accumulation in the food chain of reproductively failing bald eagles. The testimony was unavailable because the scientist charges $250 an hour for his work. Does that scientist want to use his research, knowledge, and skills to save bald eagles from continued, silent reproductive failure from organochlorine poisoning? Apparently not.

What are the rewards to you as a public interest scientist? First, you will be exercising the great privilege that Norman Maclean, author of *A River Runs through it and Other Stories* (University of Chicago Press, Chicago, 1976), remembers his father articulating: "One of the chief privileges of man is to speak up for the universe" Maclean 1992). That is quite a privilege. Second, you will be able to feel that you have paid something back to the world that has supported you: the air, the forests, and the sea. You will have earned your chance to live in a democracy.

What do they, the air, forests, and sea need you to do as a scientist, as a scientific citizen, as a person, to ensure their survival? They need you to speak up for the universe. They need you to side with them, in the public interest.

[1]R. Lightstone, California Rural Legal Assistance, Sacramento, CA 1988. Personal communication

Acknowledgments

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