

# **Author's Commentary on "The Federal Scientist: Multiple Roles and Moral Issues"**

Commentary On

The Federal Scientist: Multiple Roles and Moral Issues

This case raises several issues regarding the multiple, complex, and often competing, roles a scientist must play. In addition to responsibility to herself and her career in science, Alice is also responsible for protecting public health and safety in her role as an environmental geologist employed by the Toxic Waste Disposal Administration. As a student, Alice has taken on an additional role, which poses a potential conflict of interest with her job. We will examine each of these responsibilities in turn as we evaluate the ethical questions raised during a typical day in the life of a federal scientist.

## **Funding Research**

Alice's first ethical problem arises from her position as a federal employee. Acting as an agent of the federal government, Alice must evaluate the adequacy of research proposals to answer questions about the safety of a potential toxic waste disposal site. In conducting research on which to base recommendations to protect public health, scientists working in environmental science are faced with difficult decisions. For example, Alice's recommendations could expose future generations to potentially disastrous environmental consequences. In order to make these recommendations, scientists and engineers are being asked to predict the behavior of natural and engineered systems many generations in the future, which raises ethical as well as technical issues. In fact, the social ramifications of application of technology often are more difficult to solve than the technical conundrums. However, Alice knows that decisions on these societal issues must be based on sound science. The results of this scientific research will be used as input to the decision to site a toxic waste site or abandon the site. In either case, the decision

will be litigious and controversial.

Decisions on what research to fund and how to use research data are difficult, but they must be based on honest communication on all aspects of scientific technique and application. As funding becomes more difficult to obtain, researchers are under more pressure to oversell their expertise and techniques. The Toxic Waste Disposal Administration is paying Alice and von Wegner for their professional judgment. In order to be able to rely on their judgment, the agency must have confidence in the results of the research, which includes trust in the honesty in the descriptions of the method, its applications and limitations, and the ultimate validity of the results obtained from the method. If any one of these steps is at issue, the chain of confidence in the scientific credibility of the process is lost. Professional scientists and engineers have unique knowledge, skills, and expertise; therefore, their judgment is sought and believed. C. E. Harris, M. S. Pritchard and M. J. Rabin, *Engineering Ethics: Concepts and Cases* (Belmont, Calif.: Wadsworth Publishing Company, 1995), p. 211. Although Alice is also a geologist, as a geochemist, von Wegner has specialized knowledge of a highly specialized method in geochemistry. Von Wegner is a senior principal investigator, a well-established scientist with a strong reputation; Alice is working in a federal bureaucracy, reviewing research proposals. Of course, Alice must be competent and able to understand the general application of the method in order to recommend funding based on that determination; however, von Wegner also has a responsibility to candidly share the potential shortcomings or controversies surrounding his method. "The progress of science as a whole depends on the communication and integration of individual specialized results." Sigma Xi, *Honor in Science* (Research Triangle Park, N. C.: Sigma Xi, 1991), p. 7. Independent of the results of the research regarding the safety of the site, von Wegner should have indicated the drawbacks of his new method.

## **Public Perception of Risk**

The second ethical conundrum that confronts Alice is the role of the media in shaping public opinion and the use of science to further a political agenda (in this case, an environmental group that opposes toxic waste siting and uses science to justify that opposition). In our complex technological society, the public relies on scientists to give us objective facts about risk. The media play a critical role in communicating these facts to us. Scientists' responsibility goes beyond the

development of theory and the correct use of technique; they also have a responsibility to explain the results and implications of their research to the public. As Harris, Pritchard and Rabins state, "The doctrine of informed consent implies that engineers have a responsibility to promote the conditions in which individuals can give informed consent to risks they encounter as a result of technology. They must do what they can to ensure that the public understands the risks associated with technology and can consent to those risks, especially when they are unusual." Harris, Pritchard and Rabins, *Engineering Ethics*, p. 244.

Although we are increasingly skeptical about the veracity of information we get from the media, the fact remains that they are our primary source of information. Under pressure to sell papers and advertising time, our national media have become more and more focused on controversy, complex applications, and perceived risks from science. Although our modern lives are actually much safer than they were 50 years ago, the complexity of this technology means that life is no longer simple. D. R. Williams, *What is Safe? The Risks of Living in a Nuclear Age* (Cambridge, United Kingdom: The Royal Society of Chemistry, 1998), p. 4. Adding to the complex misinformation that the public must interpret are special interest groups and lobbyists who may use partial truths or modify reports to garner support, as in this case, the environmental group that manipulates estimates of the risk of earthquakes in order to stop the toxic waste site. Engineers and scientists must recognize that the results of their work can be misused by advocates for political agendas. We have a moral obligation to inform the public, and Alice, working through correct channels at her agency, has the responsibility to explain the risks from seismic activity on the toxic waste site in an objective, clear, and understandable way.

## **Conflict of Interest**

Alice's final ethical quandary concerns a potential conflict of interest between her federal job and her role as a student at the university. In general, these two roles would not result in conflict; however, Alice has been asked to review a research proposal from a professor at the university that is directly related to her responsibilities at the agency. Also, the research topic is closely related to Alice's area of academic interest and could form the subject for her dissertation research. The ethical dilemma exists because Alice's interests may be in conflict: as a federal scientist, she could recommend funding that would benefit her at the university.

Scientists are expected to render impartial professional judgements based on a critical objective review of the evidence; Jeffrey Kovac, *The Ethical Chemist: Case Studies in Scientific Ethics*, Case B-4A, rev. ed. (Knoxville: University of Tennessee, 1995). can Alice's judgment be objective if she can gain from her recommendations? Although Alice may be able to provide an objective, impartial review and recommendations based on science and not personal gain, her professional judgment may be biased due to the conflict. Even the appearance of a conflict can be deleterious to science. An added element of conflict is the potential for the successful application of the bacterium to affect the need for a toxic waste site.

Kovac discusses three ways to avoid conflicts of interests: 1) to avoid them; 2) to divest yourself of the external influence; and 3) to publicly reveal the influences. *Ibid.* Alice would not have to quit her job at the Toxic Waste Disposal Administration or stop taking classes at the university in order to avoid the conflict of interest; less drastic approaches would allow Alice to remain employed and pursue her academic interests. Alice should notify her supervisor and Professor Sharpo of the conflict of interest, and recuse herself from reviewing the university's proposal.