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# Making Sense of Scientists' Responsibilities at the Interface of Science and Society

Commentary on "Six Domains of Research Ethics" (K.D. Pimple)

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**Keywords:** social responsibility of scientists, norms, standards, scientists' roles

**ABSTRACT:** *As Kenneth Pimple points out, scientists' responsibilities to the larger society have received less attention than ethical issues internal to the practice of science. Yet scientists and specialists who study science have begun to provide analyses of the foundations and scope of scientists' responsibilities to society. An account of contributions from Kristen Shrader-Frechette, Melanie Leitner, Ullica Segerstråle, John Ahearne, Helen Longino, and Carl Cranor offers work on scientists' social responsibilities upon which to build.*

It is a daunting task to frame a clear and coherent approach to ethical responsibilities in "the day-to-day workings and decisions of scientists and engineers", that is, responsibilities internal to the practice of science.<sup>a</sup> However, by tracking the actual course of investigation—the collecting, recording, storing, reporting, owning, and sharing of data—and by attending to the requirements for publication and recognition, scientists and ethics specialists can formulate requirements for responsible research. With the help of graduate students and postdoctoral researchers (postdocs), they can set forth requirements for responsible training and advising of graduate students and postdocs. Trainees have been especially helpful in establishing the importance of making explicit and discussing their research groups' norms and standards and their rationales.<sup>b</sup> Gaining ground is the view that articulation of local standards and their

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- a. The quoted phrase is taken from a draft by Melanie Leitner, a recent doctoral candidate, to be included in a forthcoming handbook on research ethics written by graduate students for graduate students. The handbook is to be the product of a National Science Foundation-funded program.<sup>1</sup>
  - b. A panel of postdocs at the 1993 Sigma Xi Forum on *Ethics, Values, and the Promise of Science* made an impressive contribution, depicting the power imbalance, the consequent hazards for trainees, and the need for guidelines.<sup>2</sup>

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rationales is an element of doing science responsibly in current conditions of research in the U.S.

The challenge, as Kenneth Pimple observes, is to set out clear and cogent understandings of the social responsibilities of scientists, individually and collectively.<sup>3</sup> The Core Instructional Areas identified by the U.S. Public Health Service (PHS) include no mention of social responsibility and no attention to matters of social responsibility as such. Some would argue that these nine instructional areas take in the entire social responsibility of scientists even though consideration of implications for the well being of people and the environment is not on the list.

Yet many scientists and specialists on research ethics accept the proposition that responsibility issues in the relationship of science and technology enterprises to the larger society are part of research ethics. However, as Pimple notes, there is not yet a level of attention to and convergence on these issues comparable to the treatment of issues internal to the practice of science. We should recall that the efforts of many scientists, trainees, ethics specialists, and specialists in other fields contributed to identifying and explaining the nine PHS Core Areas.

So there is much daunting work ahead for scientists, engineers, trainees, and all the relevant specialists. They must set out the foundations and scope of scientists' responsibilities to the larger society and ways of meeting responsibilities, individually and collectively. Some arguments already put forward about the extent and foundation of scientists' responsibilities offer starting points for moving ahead in orderly fashion.

Kristen Shrader-Frechette, a philosopher of science, argues that scientists, as members of a profession, have extensive obligations to the larger society.<sup>4</sup> She contends they have not only a duty to avoid putting societal welfare at risk but also special responsibilities to promote societal welfare. She holds that researchers have a duty to abstain from certain research, to engage in research, to disseminate research (to lay people, as well as scientists) so as to avoid misuse and misapplication by others, and to "engage in whistleblowing whenever the situation warrants it."<sup>4</sup> (p.72) With respect to applied research in conditions of uncertainty, Shrader-Frechette advocates giving priority to public welfare and public decision-making over norms governing publication in science.

In her view, scientists' duties derive from an "implicit contract" between scientists and society, the status and power of scientists as members of a profession, their monopolies over information, and the rights of those affected by scientists' research. At work in her arguments is a standard view of professions according to which they are committed to serve society. Members of a profession have duties to society that are owed in return for education and other benefits they have received. In addition, the special knowledge that professionals have imposes upon them responsibilities to society.

Even granting that scientists are members of a profession, according to Shrader-Frechette's view of professions, critics may dispute her conclusions. They might argue that scientists serve society by pursuing knowledge. They might question whether public support of scientists' education requires scientists to do more than fulfill all explicit agreements they enter into in connection with their education.<sup>5</sup>

A young scientist, Melanie Leitner, presents a subtly different approach in a forthcoming, short essay.<sup>1</sup> She points out that scientists' powers to affect the wider society have increased significantly as the relationship between science and other arenas of society has grown closer. For instance, scientific findings are used more and more to validate policy decisions in government agencies, such as those dealing with environmental matters. On the basis of their possession of specialized knowledge, scientists function as expert witnesses in legal cases and as consultants in a variety of contexts, including law, education, and diplomacy. Leitner argues that with the continuing increase of linkages between science and society comes ever greater responsibility. She follows this with ideas about what this greater responsibility comprises.

The interface between science and society is exceedingly complex; frequently scientific findings give rise to surprising consequences. In this light it becomes critically important for scientists to consider the implications of what they do, Leitner argues, and to "effectively communicate this to the society at large." Furthermore, the scientific community, presumably through its professional societies and other institutions, has a responsibility, she contends, to "examine its potential and its limitations."

Leitner considers what responsibilities scientists have as beneficiaries of "the taxpayers' investment." She argues that their responsibility is to ensure to the best of their ability that the general public understands their work, "that its impact is neither over- nor understated." The duty not to lie is part of the basis for this responsibility. In Leitner's view, this responsibility means that scientists must find ways of becoming part of the public discussion, open about their limitations but not "shying away" from thinking about implications of their work. They must give up total reliance on other experts, politicians, policy makers, or democratic processes to identify and respond to the social and environmental fallout of their work.

The investment of billions of dollars of taxpayers' money in research and development requires scientists to think about whether their projects are worthy of that investment, Leitner argues. At the least this means explaining their research and its potential impact. Her point is that scientists should see themselves in a relationship with society and should not expect to continue to receive public funding without expending effort on their part to ensure that the relationship is mutually beneficial.

We can read Leitner's analysis as a call to scientists to rethink the role of scientist, to recognize that in view of the extensive and complex interconnections of science and society "it is not enough to exist in the rarefied air of academia."

A sociologist of science, Ullica Segerstråle, comes to a similar view in an article examining scientists' roles as expert witnesses in legal adjudication requiring scientific evidence.<sup>6</sup> She notes that in the legal process scientists deal with evidence that has consequences for people although scientists are normally not trained to consider social implications of their work. Believing that knowledge is better than ignorance, they are inclined to go ahead with their science, "trusting in the rationality and good will of others."<sup>6</sup> (p.54) To improve communication between the systems of science and the law, Segerstråle suggests that "scientists may need to learn how the legal mind works, and

start thinking more about consequences.”<sup>6</sup> (p.61) Here again is a suggestion to rethink the role of scientist.

Considering the activities of scientists in the increasing interconnections of science and society, Leitner and Segerstråle argue for broadening the training and outlook of scientists. Attention to features of the social context of their work should be incorporated in their training. In contrast to Shrader-Frechette, both are careful to limit the social responsibilities of scientists to what can be justified by considerations to which they appeal and to what scientists can reasonably be expected to do.

With respect to what can reasonably be expected of scientists, Pimple makes a useful distinction between social responsibilities of individual scientists and responsibilities of scientific communities.<sup>3</sup> He notes that as individuals, scientists have limited leverage. However, institutions of science, including presumably university departments, research groups, and laboratories, professional societies, science boards, and review panels, can exert influence. We need much more discussion about what can reasonably be expected of individuals and of institutions of science, and we must pay attention to their interconnections.

For example, educators and scientific societies might assume a responsibility to prepare scientists for serving as expert witnesses. On the face of it, this seems reasonable to expect in view of the important roles scientists increasingly play in adjudication. This preparation might, in turn, expand what is reasonable to expect of individual scientists regarding attention to social implications of their work.

We should not too quickly conclude that at the individual, micro-level, scientists are without power and opportunity, indeed, obligations, to meet responsibilities relating to the larger society. John Ahearne, of Sigma Xi, the scientific honorary society, offers some examples in a brochure abstract for a spring, 2002 conference sponsored by Gonzaga University. In a speech entitled “Speaking Truth to Power: The Ethics of Providing Technical and Scientific Advice to the Government,” his issues for consideration include “pressures to hold back unwanted analysis or recommendations, concerns about losing follow-on funding, uncertainty about whether the expert’s personal values should be incorporated into his or her advice, and the risk of taking a position that may alienate one’s peer group.”<sup>7</sup>

By addressing such problems for individuals, scientists and other specialists may well construct responses that could serve as general guides, as policies for handling problematic situations of those kinds. Typically, in addressing ethics problems of individual professionals, we look for resolutions that can be applied to others similarly situated. By this means, policies for the institutions of science may develop and, with luck, help to shape those institutions. For example, Sigma Xi itself could eventually play a role in disseminating to individuals and other bodies (such as the American Association for the Advancement of Science, scientific societies, and even the PHS) guidelines derived from discussion of these issues.

In a chapter that Kristin Shrader-Frechette includes in her volume, the philosopher of science, Helen Longino, offers another perspective on scientists’ social responsibility.<sup>8</sup> Longino uses the examples of gender and racial bias to show how societal values figure in scientific investigation. She explains how gender and race

“ideologies” influence data gathering, description, and interpretation of data. Arguing that researchers should attend to the way contextual values shape research, she concludes that the scientific community as a collectivity has a duty to create a context for research in which “problems of bias are likely to be exposed.”<sup>8</sup>(p.151) The foundation of this duty is scientists’ commitment to seek truth.

Another contributor to Shrader-Frechette’s volume, the philosopher Carl Cranor, addresses conflicts scientists face when scientific evidentiary standards are more demanding than health-protective evidentiary standards.<sup>9</sup> These conflicts come up often in situations of uncertainty. Unlike Shrader-Frechette, he eschews holding that, in view of the stakes, one alternative should always dominate the other. Instead, he provides guidance for thinking through how to strike a balance, taking into account the institutional context for decision-making and the public interests at stake. In this way, he provides an illustration of how scientists’ particular involvements with the larger society (which Leitner invokes as a basis of responsibility) shapes their social responsibility.

With these examples of reflection focused on social responsibilities of scientists, we can see that while there is much work to be done, it is well started. Scientists and specialists who study science have begun lines of analysis that they and others can carry forward. Bringing their efforts to the attention of more scientists and the various institutions and bodies of science should stimulate more discussion, conferences, publications, useful concepts, and strategies. Perhaps eventually the increased attention will lead to defining core areas to add to the PHS list.

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