

TEACHERS' EXCHANGE

EDITOR'S NOTE: There is increasing pressure from funding and regulatory agencies to provide instruction on ethical issues in scientific research. Some of the "issues" are obvious truths -- it is wrong to make up research data or to steal ideas. But others require a more careful analysis: patenting research products, interpreting ambiguous or meager data, replicating experiments, marketing vs testing approved drugs in Phase IV studies, and so on. These would be timely topics for Society meetings and for future contributions to the "Teachers' Exchange".

The following is an excerpt from the introduction to the pilot session of a course directed by Ellen More and taught by an interdisciplinary faculty at University of Texas Medical Branch at Galveston.

PAINTING THE MICE

Early one morning in 1973, the dermatologist and transplantation researcher, Dr. William Summerlin, performed a simple procedure on two white mice. Each received a black engrafted skin patch. The procedure took only seconds since only the color, not the graft, was new. On his way to a meeting with Dr. Robert Good, director of the Sloan-Kettering Institute for Cancer Research, Summerlin decided to enhance his fading research program by directly "enhancing" his subjects with a black felt tip pen.

Beyond the irreparable damage to Summerlin's career, his actions had no immediate consequences for the reputation - or regulation -- of science. Only in the wake of several later cases, notably the fabrication of experimental data by Harvard cardiologist John Darsee in 1981, was a train of events set in motion that resulted in the creation of the Offices of Scientific Integrity at NIH and Scientific Integrity Review at the Public Health Services in 1989. A year later NIH announced its requirement that institutions applying for training grants establish programs to teach the ethical conduct of science. That same year, the television series NOVA aired the much-praised documentary, "Do Scientists Cheat?"

Since then, the papers have reported a steady stream of stories surrounding a few notorious cases. "Baltimore" and "Gallo" are the best known so far. Even a new journalistic genre -- investigative science reporting -- emerged between 1983 and 1987 and has now come into its own with a 52,000-word story by John Crewdson in the *Chicago Tribune* (Nov 19, 1989) on the alleged misappropriation of crucial samples of the original HIV isolates by Robert Gallo of the NIH. Universities must now establish written policies to respond to allegations of misconduct and afford due process both to the accused and the accuser. Even a computerized "plagiarism-detector" (developed originally for works of literature) is being used to "objectively" assess the integrity of scientific publications. NIH "Fraud-busters" Walter Stewart and Ned Feder, for example, have attempted to apply it to a case of alleged plagiarism in a surgical textbook.

Yet, notwithstanding Summerlin's painted mice, the history of science yields few truly "black and white" cases of misconduct. Despite the notoriety of the cases under investigation, only six scientists have been barred from Federal funding on the grounds of conducting fraudulent research. Surely this is because science -- like ethics -- depends on the judgments of its practitioners. The art of science, if you will, consists in the art of sound judgment: What questions to ask? What procedures to employ? How to interpret the results? And, in the face of ambiguous results, what now? At the margins of scientific practice lie a few thou-shall-nots like theft and fabrication of data. Mostly, though, the terrain is filled with the microethical choices of everyday life in the lab.

This realization is shaping the way we teach the ethics of science -- in small, highly interactive groups directed jointly by faculty from the humanities and the basic sciences. The issues we introduce -- the professional and philosophical underpinnings of science; the role of values in research; the mutual responsibilities of senior and junior investigators; mechanisms for responding to misconduct; the social responsibility of science; and, the ethics of animal care and use in science -- will acquire their relevance not in the adjudication of fraud, but in the ordinary decision making of everyday scientific work.

Thus, we begin with a forum of highly respected, senior scientists from within our own community, describing certain key experiences and acknowledging their personal perspectives on the interplay between the ethics and practice of science. Later in the semester we will reproduce this format with a panel of science journal editors. We will conclude with a follow-up session in which the original, faculty-student discussion groups will re-convene to reassess the major themes and issues of the course, draw up an informal working list of guidelines for senior and junior researcher practices, and discuss our institution's official guidelines for defining and handling accusations of misconduct.

I doubt that, except within the home, any one can mold another's character. But we can and must shape the experiences and expectations of student scientists. We must "initiate" students into the traditions and values of science as practiced in this culture. (Just possibly we may also RE-shape the expectations and standards of experienced researchers at the same time, a double dividend from the collaborative organization of this course.) If so much in the practice of science is governed not by hard and fast rules, but by the subtleties of professional judgment and discrimination, then the profession has a responsibility to introduce its newest members to the standards it will expect them to live by. The difference between the exercise of legitimate professional judgment and "painting the mice" is rarely black and white, but is a crucial difference.

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