

ETHICS AND SCIENTIFIC RESEARCH

A Selective Chronology with References

A summary overview in adapted bibliographical essay format of phases in the development of collective role responsibility for research integrity. This overview, largely prescinds from the issue of human subjects research, which has its own special history.

1970s

Rise of Research Ethics Concerns in the United States

- 1974 William Summerlin (Sloan-Kettering Institute) “painted mice” case. See Joseph R. Hixson, *The Patchwork Mouse* (Garden City, NY: Doubleday, 1976). Scientific concerns about the dangers of recombinant DNA research lead to a short-term voluntary suspension of such work and an Asilomar, CA, conference to develop safety guidelines. American Association for the Advancement of Science (AAAS) and the American Bar Association (ABA) jointly establish the National Conference of Lawyers and Scientists (NCLS).
- 1975 John T. Edsall *et al.* report on “Scientific Freedom and Responsibility.” This report by an AAAS Committee on Scientific Freedom and Responsibility (CSFR), which was first established on an ad hoc basis in 1970, led to the drafting and approval of a formal charter for the CSFR in 1976. (Charter revised 1979 and again 1996.) Among the first major post-Edsall activities of CSFR was the AAAS Professional Ethics Project, which produced a workshop report and collection of ethics documents: Rosemary Chalk, Mark S. Frankel, and Sallie B. Chafer, eds., *Professional Ethics Activities in the Scientific and Engineering Societies* (Washington, DC: AAAS, December 1980).
- 1978 Gerald Holton and Robert S. Morison edit a special issue of *Daedalus* (vol. 107, no. 2, Spring) on “Limits of Scientific Inquiry,” examining the new social criticism of science; subsequently published as a book (New York: W.W. Norton, 1979).
- 1979 The first U.S. Student Pugwash Conference, emphasizing applied social responsibility. Proceedings published in Sanford A. Lakoff, ed., *Science and Ethical Responsibility* (Reading, MA: Addison-Wesley, 1980).

1980s

Publicity of Specific Cases of Research Misconduct and Formulation of Explicit Definitions

- 1979- Five separate scientific misconduct cases make the news: (a) Stephen Krogh
1981 Derr (*New Scientist*, 4 October, 1979); (b) Elias A.K. Alsabti (*Science*, vol. 208); (c) Marc J. Strauss (*Boston Globe*, 29 June 1980 ff.); (c); (d) John Long (*Science*, vol. 211); and (e) Vijay R. Soman (*New York Times Magazine*, 1 Nov. 1981) — all subsequently detailed (along with others) in William Broad and Nicholas Wade,

Betrayers of the Truth: Fraud and Deceit in the Halls of Science (New York: Simon & Schuster, 1982). (Broad and Wade were science writers for the *New York Times*.)

- 1981 Representative Albert Gore, Jr., chair of the Investigations and Oversight Subcommittee of the House Science and Technology Committee, holds the first hearing on the emerging problem of scientific fraud and misconduct.
- 1983 Robert Sprague initiates inquiry into the research claims of Stephen Breuning (Univ. of Pittsburgh) — which leads to 1988 federal conviction of Breuning for filing fake research reports.
Two other relevant publications:
- Leonard A. Cole, *Politics and the Restraint of Science* (Totowa, NJ: Rowman and Allanheld, 1983).
 - Kare Berg and Knut Erik Tranoy, eds., *Research Ethics* (New York: Alan R. Liss, 1983), the proceedings of a symposium organized by the Norwegian Academy of Science and the first book to be so titled.
- 1984 Sigma Xi, The Scientific Research Society, publishes a pamphlet, *Honor in Science*, to provide “practical advice to those entering careers in scientific research.” Revised, 2nd edition, Research Triangle Park, NC: Sigma Xi, 1986.
Another publication dealing with the social context of scientific research: Dorothy Nelkin, *Science as Intellectual Property: Who Controls Scientific Research?* (New York: Macmillan, 1984).
- 1985 Luc Montagnier (Pasteur Institute, Paris) charges that Robert Gallo (NIH) misappropriated his 1983 AIDS virus (and case drags on for ten years).
US Congress requires the Public Health Service (which includes NIH) to publish fraud and misconduct regulations.
Direct line administrative results of this legislation:
- 1986 Guidelines published in the *NIH Guide for Grants and Contracts* define scientific misconduct as “fabrication, falsification, plagiarism [FFP] or other practices that seriously deviate from those that are commonly accepted within the scientific community for proposing, conducting, or reporting research.”
 - 1989 Final Rule, “Responsibilities of Awardee and Applicant Institutions for Dealing with and Reporting Possible Misconduct in Science” published in the *Federal Register* (Aug. 8).
Creation of the Office of Scientific Integrity (OSI) at NIH and an Office of Scientific Integrity Review (OSIR) in the Office of the Assistant Secretary for Health (OASH) in the Department of Health and Human Services (HHS).
 - 1990 In response to a legal suit filed by James H. Abbs (University of Wisconsin), federal Judge Barbara Crabb rules OSI procedures invalid because they had not been submitted to public comment as required by the Federal Administrative Procedures Act.

- 1991 OSI procedures opened to public comment.
- 1992 OSI and OSRI consolidated into the Office of Research Integrity (ORI) in the OASH.
- 1993 NIH Revitalization Act establishes ORI as an independent entity within HHS reporting directly to the Departmental Secretary.
- 1986 David Baltimore, Thereza Imanishi-Kari, and David Weaver publish article in *Cell* (April) which later that year post-doc Margot O'Toole challenges as based on fabricated data. (Case eventually leads to government investigation by Congressman John Dingell [D-MI] and Baltimore's 1991 resignation as President of Rockefeller University. But on appeal Imanishi-Kari and Baltimore are exonerated in 1996 by the Departmental Appeals Board in the Department of Health and Human Services.) See Daniel J. Kevles, *The Baltimore Case: A Trial of Politics, Science, and Character* (New York: W.W. Norton, 1998).
Another study appears on scientific misconduct in general: Alexander Kohn, *False Prophets: Fraud and Error in Science and Medicine* (New York: Blackwell, 1986).
- 1987 National Science Foundation (NSF), "Misconduct in Science and Engineering Research," *Federal Register*, 52(126), pp. 24466-24470 — leading to the 1991 "Misconduct in Science and Engineering Research: Final Rule," *Federal Register*, 56(93), pp. 22287-22290. Like NIH, NSF defines scientific misconduct as deviations from accepted conduct such as fraud, falsification, and plagiarism [FFP].
Oversight responsibility vested first in the NSF Office of Audit and Oversight, but transferred in 1989 to the new NSF Office of Inspector General.
First of three AAAS workshops on Scientific Fraud and Misconduct (2nd and 3rd workshops, 1989).
- 1988 US Congress, House Committee on Government Operations, "Scientific Fraud and Misconduct and the Federal Response," Hearing before Subcommittee on Human Resources and Intergovernmental Relations, 100th Congress, 2nd Session, April 11. Popular concern about scientific misconduct reflected in Noel Buckner and Rob Whittlesey, producers, "Do Scientists Cheat?," *Nova* (PBS, WGBH, Boston).
- 1989 US Congress, House Committee on Energy and Commerce (John Dingell, chair), "Scientific Fraud," Hearing before Subcommittee on Oversight and Investigations, 101st Congress, 1st Session, May 4-5.
Stanley Pons and Martin Fleischmann announce the discovery of "cold fusion." See three studies: by hot fusion physicist Rank Close, *Too Hot to Handle: The Race for Cold Fusion* (Princeton, NJ: Princeton University Press, 1991); by chemist and co-chair of the U.S. Department of Energy Cold Fusion Panel, *Cold Fusion: The Scientific Fiasco of the Century* (Rochester, NY: University of Rochester Press, 1992); by science journalist Gary Taubes, *The Short Life and Weird Times of Cold Fusion* (New York: Random House, 1993).
Further publications related to the general theme of ethics and scientific research:
— William R. Shea and Beat Sitter, eds., *Scientists and Their Responsibility* (Canton, MA: Watson, 1989), the proceedings of an international conference

- sponsored by the Swiss Academy of Sciences and related institutions.
- Carl Mitcham and Philip Siekevitz, eds., *Ethical Issues Associated with Scientific and Technological Research for the Military*, proceedings of a 1989 conference, *Annals of the New York Academy of Sciences*, vol. 577.
- National Academy of Sciences, *On Being a Scientist* (Washington, DC: National Academy Press, 1989; 2nd edition, 1995).
- Association of American Universities, *Framework for Institutional Policies and Procedures to Deal with Fraud in Research* (Washington, DC: Association of American Universities, 1989).

1990s

Reconsidering Definitions of Research Misconduct

- 1990 — Council of Biology Editors, *Ethics and Policy in Scientific Publication* (Bethesda, MD: Council of Biology Editors, 1990), the first extensive ethical analysis of scientific editing and publishing.
- Daryl E. Chubin and Edward J. Hackett, *Peerless Science: Peer Review and U.S. Science Policy* (Albany: State University of New York Press, 1990), the first monograph examining the problems of peer review.
- 1991 *Time* magazine (August 26) cover story on “Science under Siege,” again reflects public concern about the issue of scientific misconduct.
- 1992 Panel on Scientific Responsibility and the Conduct of Research, National Academy of Sciences, National Academy of Engineering, and Institute of Medicine, *Responsible Science*, vol. 1: *Ensuring the Integrity of the Research Process*; vol. 2: *Background Papers and Resource Documents* (1993). Proposes to narrow the FFP definition by eliminating “or other practices that seriously deviate from those that are commonly accepted within the scientific community” (see under 1985 above, 1989).
- Robert Bell, *Impure Science: Fraud, Compromise, and Political Influence in Scientific Research* (New York: John Wiley, 1992), examines Breuning, Baltimore, and other cases.
 - Albert H. Teich and Mark S. Frankel, *Good Science and Responsible Scientists: Meeting the Challenge of Fraud and Misconduct in Science* (Washington, DC: AAAS, 1992), reviews the developing problem of scientific misconduct and responses in the professional scientific community.
 - Marcel C. LaFollette, *Stealing into Print: Fraud, Plagiarism, and Misconduct in Scientific Publishing* (Berkeley: University of California Press, 1992), the first monograph with survey data on this topic.

- 1993 AAAS workshop on “Responding to Allegations of Research Misconduct: A Practicum.”
 U.S. Congress establishes the Commission on Research Integrity (CRI).
 Revelations about US radiation experiments on humans in late 1940s and 1950s.
- Darwin Cheney, ed., *Ethical Issues in Research* (Frederick: MD: University Publishing Group, 1993), the first general anthology on the subject.
 - Ruther Ellen Bulger, Elizabeth Heitman, and Stanley Joel Reiser, eds., *The Ethical Dimensions of the Biological Sciences* (New York: Cambridge University Press, 1993), the first anthology on ethics and biology.
- 1994 — Kristin Shrader-Frechette, with Helen Longino, Carl Mitcham, and Carl Cranor, *Ethics of Scientific Research* (Lanham, MD: Rowman and Littlefield, 1994), the first philosophic monograph and textbook on research ethics.
- Edward Erwin, Sidney Gendin, and Lowell Kleiman, eds., *Ethical Issues in Scientific Research: An Anthology* (New York: Garland, 1994), another textbook.
 - John M. Braxton, ed. “Perspectives on Research Misconduct,” theme issue, *Journal of Higher Education*, vol. 65, no. 3 (May/June 1994), pp. 239-400, identifies a movement from “collective responsibility” to responsibility resting with a “trans-scientific community.” Enhanced version: *Perspectives on Scholarly Misconduct in the Sciences* (Columbus, OH: Ohio State University Press, 1999).
- 1995 Final report of the CRI, proposing replacement of FFP with a definition of scientific misconduct as misappropriation, interference, and misrepresentation [MIM] and a more active role for ORI.
 Final report of the Committee on Human Radiation Experiments.
 Two new textbooks:
- Robin Levin Penslar, ed., *Research Ethics: Cases and Materials* (Bloomington, IN: Indiana University Press, 1995).
 - Francis L. Macrina, ed., *Scientific Integrity: An Introductory Text with Cases* (Washington, DC: American Society for Microbiology, 1995).
- 1997 A two-part textbook published:
- Deni Elliott and Judy E. Stern, eds., *Research Ethics: A Reader* (Hanover, NH: University Press of New England, 1997).
 - Deni Elliott and Judy E. Stern, *The Ethics of Scientific Research: A Guidebook for Course Development* (Hanover, NH: University Press of New England, 1997).
- 1998 A second philosophical monograph and textbook: David B. Resnik, *The Ethics of Science: An Introduction* (New York: Routledge, 1998).
- 1999 Donna Shalala, Secretary of Health and Human Services, publishes for 60-day comment (until December 13, 1999) a new interagency definition of scientific

misconduct oriented more toward FFP than MIM, and removes from ORI authority to investigate. ORI directed to focus on education and research. Michael Davis, *Ethics and the University* (New York: Routledge, 1999), gives an interpretative overview of applied ethics in academic practice.

2000-present
Research on Research Misconduct

- 2000 Office of Science and Technology Policy issues federal-wide research misconduct policy.
ORI proposes new policy on Instruction in the Responsible Conduct of Research, which is subsequently withdrawn in response to criticism from scientists and Congress.
ORI convenes first Research Conference on Research Integrity.
- 2001 ORI and AAAS convene conference on Legal Issues and Strategies for Responding to Research Misconduct Allegations.
ORI/NIH funds first round of grants for research on research integrity.
- 2002 AAAS re-releases five videos on “Integrity in Scientific Research.”
ORI/NIH funds second round of grants for research on research integrity.
Committee on Assessing Integrity in Research Environments, Institute of Medicine, issues its report on *Integrity in Scientific Research: Creating an Environment that Supports Responsible Conduct* (Washington, DC: National Academy Press, 2002).
ORI convenes second Research Conference on Research Integrity.

— Carl Mitcham (March 2003)