Research Integrity and Everyday Practice of Science

Frederick Grinnell*[1]

[1]UT Southwestern Medical Center (UTSW) – 5323 Harry Hines Blvd, Dallas, TX 75390, United States

Abstract

Science traditionally is taught as a linear process based on logic and carried out by objective researchers following the scientific method. Practice of science is a far more nuanced enterprise, one in which intuition and passion become just as important as objectivity and logic. Whether the activity is committing to study a particular research problem, drawing conclusions about a hypothesis under investigation, choosing whether to count results as data or experimental noise, or deciding what experimental findings to present in a research paper and in what order to present them, ethical challenges inevitably will arise because of the ambiguities inherent in practice. Sir Peter Medawar criticized scientific papers because one could not learn the "adventures of the mind" that led researchers to make their discoveries. These adventures and the ambiguities that they reveal should become a component of research integrity education by introducing scientific memoirs into the curriculum. For instance, by reading Watson's *The Double Helix* students will learn that the path to discovery is anything but linear and that the researchers involved are anything but disinterested. Unless the ambiguities of practice are acknowledged and their sources understood explicitly, research integrity education will not adequately prepare the individuals receiving the training for the kinds of decisions essential to responsible conduct that they will have to make as scientists. Also, research integrity education should begin early, perhaps in conjunction with science fair, to help avoid misimpressions on the part of students (and their teachers) about the nature and practice of science.

*Speaker