



## Can We Use Science to Know Our Ends?

Author: SCHROM, DAVID

Source: BioScience, 54(4) : 284

Published By: American Institute of Biological Sciences

URL: [https://doi.org/10.1641/0006-3568\(2004\)054\[0284:CWUSTK\]2.0.CO;2](https://doi.org/10.1641/0006-3568(2004)054[0284:CWUSTK]2.0.CO;2)

---

BioOne Complete (complete.BioOne.org) is a full-text database of 200 subscribed and open-access titles in the biological, ecological, and environmental sciences published by nonprofit societies, associations, museums, institutions, and presses.

Your use of this PDF, the BioOne Complete website, and all posted and associated content indicates your acceptance of BioOne's Terms of Use, available at [www.bioone.org/terms-of-use](http://www.bioone.org/terms-of-use).

Usage of BioOne Complete content is strictly limited to personal, educational, and non - commercial use. Commercial inquiries or rights and permissions requests should be directed to the individual publisher as copyright holder.

---

BioOne sees sustainable scholarly publishing as an inherently collaborative enterprise connecting authors, nonprofit publishers, academic institutions, research libraries, and research funders in the common goal of maximizing access to critical research.

# Can We Use Science to Know Our Ends?

In "Bioethics: Are Our Priorities Right?" (*BioScience* 53: 1207–1216), Paul Ehrlich exhorts us to "do everything possible to encourage discussion and debate of the ethical issues facing society." I am heeding his call by challenging a crucial assumption underpinning our approach to ethics: that we may use science to discern means, but not ends. I perceive this notion, despite its long tenure and near-universal acceptance, to be without sound foundation and immensely harmful.

People base ideas about value—about what we want (ends) and how to get it (means)—upon predictions. When we think we value something, whether we term it an "end" or a "means," we do so in anticipation of future events.

We can formulate a useful outcome-based definition of science as "behavior by which we improve prediction more than we can expect to improve it by chance." With science, and only with science, may we increase the accuracy with which we discern value.

Many of us deny this. We label some values "ends" and hold these pseudo-values beyond challenge, claiming and granting immunity from accountability to observable experience in much the same way lottery players think about "lucky numbers." We assert that value is ours to decide.

I maintain that we cannot decide value—to "decide" is by definition to end uncertainty. With ideas about value we represent aspects of the material universe. We represent imperfectly and know with uncertainty. With value, as with other phenomena (e.g., theories of motion from Aristotle to Newton to Einstein), we know more accurately only by practicing science to conform ideas to ongoing observations.

I perceive in what Ehrlich calls our "intensifying human predicament" mounting evidence that we are extensively and fundamentally misinformed about how we know and realize value. To

redress this, we require a sweeping revolution in thinking.

We catalyze that revolution when we recognize science as the sole demonstrated means to more accurately discern means *and* ends, and acknowledge that we already sometimes use it to know both. For example, we've abundant evidence that humans, like other species, are genetically informed to reproduce as often as we're able. We apparently did so for a million or so years. With each passing day, more of us act otherwise as a result of practicing science.

We have compelling precedent of advantage reaped by expanding the domain of science (e.g., to investigate Earth's motion and age or the origins of species) in the face of widespread belief that this was impossible and by altering scientific usage of common words (e.g., *space* and *time*) to reflect new understanding. We enjoy analogous gains by expanding the domain of science to include all values inquiry and by defining science and value to emphasize their nexus: prediction.

Scientists worldwide share broad consensus about much that is already within our domains. As more people more consistently practice inclusive science-based values inquiry, we establish greater consensus in this realm, evolve human values increasingly concordant with natural law, and get more of what we want and want more of what we get.

DAVID SCHROM  
Senior Fellow  
Magic, Inc.  
PO Box 15894  
Stanford, CA 94309

## Letters to the Editor

*BioScience*  
1444 I St., NW, Suite 200  
Washington, DC 20005  
E-mail: bioscience@aibs.org

The staff of *BioScience* reserves the right to edit letters for clarity without notifying the author. Letters are published as space becomes available.

## THE ETHICAL ISSUES

Paul Ehrlich, Bing Professor of Population Studies at Stanford University, presented many persuasive arguments and raised many important issues in his article "Bioethics: Are Our Priorities Right?" (*BioScience* 53: 1207–1216). His passionate presentation gives fuel, however, to the claim of social constructionists that scientific theories and hypotheses are the products of the economic, social, and cultural milieu, allowing social constructionists to assert that it is impossible for science to provide an unbiased, objective view of the world.

During 2004, we will hear a lot about values, ethics, integrity, and politics. There is a continuing discussion on whether the correct emphasis in research is on integrity or ethics. Ethics is generally defined in terms of a system of moral principles and as a branch of philosophy dealing with values relating to human conduct with respect to the rightness and wrongness of certain actions and to the goodness and badness of the motives and ends of such actions. Moral conduct, then, is behavior in accord with virtuous principles rather than in deference to law and normative standards. *Integrity* denotes untouched or uncorrupted, and therefore honest and with honor, according to both moral principles and law. Responsible conduct of research encompasses legal requirements and normative standards of conduct as well as moral decisionmaking. In applied and professional ethics, ethics is often defined as "the rules that govern the conduct of a profession." The distinguishing characteristic of conduct governed by moral principles (ethics) and those by generally accepted normative standards (integrity or probity) are not well delineated in many professional situations.

*Values* refer to the relative worth, merit, or usefulness of ideals and customs. Values are the feelings of the subject (the person or institution), not of the object (the ideal or practice). Values

change with time, place, and circumstance. Professor Ehrlich calls for a society dedicated to equitable sharing of natural capital and to a sustainable environment. These are values, not ethical principles.

*Politics* refers to the process by which the behavior and actions of a population are directed and controlled. Politics in a representative democracy such as ours involves the strategies and techniques used to acquire the influence or power needed to implement, prevent, or enforce

practices that control the conduct of others. When Professor Ehrlich admonishes us as scientists that "we are ethically bound to give our fellow citizens the benefit of our best counsel on issues at the interface between science and society," he is calling for political, not ethical, action. Those participating in the political process may be guided by and invoke values and ethics, as well as economics and scientific knowledge, in their efforts to persuade others to support their agendas. Scientists need to

exercise restraint in claiming a scientific foundation for their political positions when they are basing their argument on a culturally influenced personal moral code, on time-sensitive values, or on personal gain.

GAYLEN BRADLEY

Senior Associate

Director of Research Affairs

Penn State College of Medicine

500 University Drive, MC H138

Hershey, PA 17033

