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"On Scientific Misconduct in University Research"

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**Commentary**


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*To approach the problem of research misconduct sensibly, we need a better understanding of not only the incidence of misconduct but also alternative mechanisms for handling allegations. Universities with well-developed mechanisms might provide support and information to institutions newly confronting such issues. Reconsideration and articulation of standards will help, but all efforts must be balanced with attention to how they may affect the U.S. research system overall.*

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## **On Scientific Misconduct in University Research**

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*Scientific misconduct is not an invention of the 1980s or 1990s; there is little doubt that scientists (like the rest of humankind) have strayed, at least occasionally, since the earliest days of scientific inquiry. What is new in the experience of today's generation of scientists, however, is the environment in which they are working. For although earlier scientists may have enjoyed the luxury and freedom of being above suspicion, if not beyond reproach, such is no longer the case.*

*It is a new world, in which the laboratory is surrounded by investigative reporters reared on Woodward and Bernstein, political watchdogs, disillusioned taxpayers, and a slew of others, all eager to scrutinize and criticize, and some more prone to disappointment at finding that everything is above board than the opposite. Further, the size of the scientific enterprise has*

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expanded dramatically, and previous informal response methods are no longer effective or appropriate. This new environment, I believe, rather than any fundamental change in the way scientists think about their work, has made it critical for individual investigators, and the institutions in which they work, to meet head on the complex set of issues surrounding scientific misconduct.

The fact is that universities are relatively unskilled at this, largely because they lack the relevant experience. This lack of experience stems not from a dearth of misdeeds by earlier scientists but rather from the simple reality that it is a difficult and uninviting task, and universities were not forced to come to grips with it formally before now.

Although the current environment may seem, on the surface, hostile to science, it presents an important opportunity: to build a rational and effective system to deal with issues of misconduct. If we are able to capitalize on this opportunity, American science will not suffer, and may indeed emerge the stronger for it. I suggest that if those who know science best refuse to take this opportunity seriously because they believe (quite likely correctly) that the incidence of misconduct is extremely small, American science may well suffer. To turn this situation to larger advantage and benefit, members of the community—from bench scientists to administrators—must acknowledge that these issues are critical, must respond personally when things go wrong in their own institutions, and must face facts unflinchingly—and publicly—when misconduct is found to have occurred.

If we are to approach this problem sensibly, we must know the actual (as opposed to publicized or anecdotal) incidence of scientific misconduct; we must agree about who has responsibility for responding to allegations of misconduct; and we must agree on one or more definitions of misconduct. Attaining such knowledge and agreement is more complicated than it might seem because the perspectives of the interested and affected parties are so diverse that at times there seems to be no possible common ground.

The honest scientist who believes the topic of scientific misconduct is accorded attention far out of proportion to its frequency and importance is not likely to be especially supportive of efforts to strengthen existing or develop new mechanisms for enforcement. Legislators and reporters who have witnessed poor institutional responses to highly publicized misconduct cases are unlikely to accept assertions from the scientific community that the incidence of scientific misconduct is low and not worthy of investigation. University administrators and scientific and professional societies are caught somewhere in the middle.

Universities are struggling with competing priorities—painfully aware of the need to do a better job in this area, concerned about the expenses of

responding to allegations in a climate hostile to higher administrative costs, and mindful of the importance of remaining true to the principles of academic governance. Scientific and professional societies (and their journals) are confronted with suggestions that they should assume a larger role in the prevention, detection, and punishment of research misconduct, but it is not entirely clear how they could actually (and helpfully) do so.

None of this contributes to the clarity of the larger debate. Sometimes lost among the competing views is the central concept that the overarching goal of the entire process should be to protect and promote the integrity of research, and to achieve a system that supports and encourages the traditional scientific values of honesty and openness in the pursuit of new knowledge. Whether the developments of the last five or ten years have contributed to or detracted from this goal is an open question. The challenge is to design and implement appropriate responses to unacceptable conduct—at a reasonable cost—without damaging or impairing the American scientific community and its progress.

### *Incidence of Scientific Misconduct*

At my institution, the University of Illinois at Urbana-Champaign, the reported incidence of misbehavior related to research and publication is not high: questions concerning the propriety of someone's academic conduct reach my office, at the campus level, one or two times a month. (Half or more of these questions typically come from the humanities or social sciences.) Most of these situations are resolved through informal discussion or mediation; often they stem from miscommunication or are based on incomplete information. Perhaps two to four times a year, an informal response is not successful or is not appropriate, and instead an inquiry is conducted according to the provisions of the university's policy on academic integrity. Once every two years or so, an inquiry leads to a formal and more prolonged investigation.

Discussions with research administrators at other universities suggest that this level of activity is not unusual and may be fairly typical. Although this information is not exhaustive (these numbers cover only *reported* incidents, and there is no mechanism for evaluating the disposition of each reported problem), it would be useful to gather comparative data—both statistical and anecdotal—from a number of research institutions in a systematic fashion.

### *Response to Allegations*

Currently, institutions have the primary responsibility for responding to allegations of scientific misconduct. Logically and practically, this would seem to be the right location for those responsibilities. This continues to be controversial, however, because there have been so many reported instances of universities failing to respond appropriately when they are confronted with allegations of misconduct.

One alternative is to argue that institutions simply cannot discharge this responsibility adequately. The rather dismal public record might seem to support this view, and the difficulties inherent in confronting and disciplining one's own are readily apparent. If, as seems probable, individual institutions encounter only small numbers of misconduct cases, they will never have more than a limited base of experience and expertise with misconduct. This might lead to the conclusion that the primary responsibility for reviewing and investigating allegations of scientific misconduct should lie outside universities, with public agencies or private firms that would have the necessary distance and objectivity and could acquire the required expertise. Although outside counsel of one sort or another would have certain advantages, the disadvantages of this approach would not be trivial. It probably would be cumbersome and expensive, and outsiders might take a very long time to come to understand aspects of institutional culture and individual personality that are well known within the particular university.

On the other hand, the sense that institutions are unable to discharge their responsibilities diligently may be distorted. The standards for judging the quality of institutional responses have changed over the past five years, and it has been difficult for universities to keep pace. I know that at my university we have become much more adept at dealing with these problems: experience is a good teacher. One aspect that many have found troubling is the prospect of making problems public. We have done so, and found the long-term effect to be beneficial, not harmful.

As increasing numbers of cases are handled well, the various groups with an interest in keeping the locus for these processes at the institution should develop mechanisms to provide support and information for other institutions with less experience, as well as providing assistance in particular problem situations. The accreditation model proposed by Moss (see p. 158 in this issue. —Ed.) could be a useful outgrowth of and addition to such efforts. These could be cost-effective approaches that might well accelerate the rate of progress on these issues for the scientific community as a whole.

Of course, this alternative does not directly address the charge that institutions lack the ability or the will to investigate themselves. If the possibility of vested self-interest or institutional loyalties is acknowledged, however, structural safeguards can be devised to avoid or resolve these problems. For example, the involvement of respected objective nonadministrative faculty members in the evaluation of alleged misconduct is a powerful deterrent to whitewashing or cover-ups: first-rate researchers will not countenance dishonest scholarship at the institution with which their own professional reputations are associated and care not a whit if the institution must return funding to an external sponsor of research. Further, it can be extremely helpful to include on investigative committees (that is, those committees reviewing cases in which the evidence has been found to warrant a more formal and lengthy investigation) at least one external member drawn from outside the institution. Finally, full openness and disclosure where misconduct is found can dispel questions and suspicions and in the long run can have a positive rather than negative effect on both the public perception of the institution and the conduct of research in it.

Even within federal agencies, there is no agreement over where oversight of scientific misconduct investigations properly resides. Several different models exist, ranging from the creation of separate, special offices for such functions to their assignment to existing audit or investigative offices. The accumulation of further experience will reveal the most effective models over time. This is an area in which additional research and discussion might also be productive.

### *Definition of Misconduct*

Diverse perspectives result in sharply differing conclusions as to what should be included and what excluded from a definition of research or scientific misconduct. Concern over the intrusion of external bureaucracies and abuse of flexibility lead many working scientists to argue that the federal definition of misconduct should be narrow and explicit. They prefer to exclude any nonspecific prohibition of unacceptable scientific conduct, out of concern that it might be used against unconventional (but not improper) science. (That this has not occurred to date is of little comfort to those with this concern.)

On the other hand, university administrators who are charged with responding to problems know that honest people are not good at definitively listing all possible bad deeds; some thus argue that a broader definition—

perhaps with tighter and more specific exclusions—should be kept and that abuses of flexibility should be dealt with as they occur. Otherwise, institutions may be left unable to respond to egregious acts that have a direct negative impact on scientific progress. It seems unlikely that additional data or analysis will contribute to the resolution of this issue; much will depend on the course of events over the next year or so, as more information and experience accrue.

### *How to Protect and Promote the Integrity of Research*

Clearly, misconduct cannot and should not be tolerated. It is equally clear that universities and the scientific community have not covered themselves with honor in responding to reported instances of misconduct. The question is how to maintain standards without undermining a system—the American scientific enterprise—that we very much need to continue to succeed. In the end, the following important questions must be answered: Are the resources being devoted to reported scientific misconduct proportionate to the size and seriousness of the problem at hand? Are they cost-effective? Does their expenditure contribute to strengthening the American system of science? We cannot allow such questions to be lost in the heat of the current debate.

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