More Questions About Research Misconduct

Talk of research misconduct is, alas, once again in the air, and so we have to deal with it. On p. 34 of this issue, we review the history of the remarkable research program conducted at Bell Labs by Jan Hendrik Schön and a number of colleagues. That program has now come under scrutiny: Physicists from other institutions have been examining their papers in several leading journals, finding problems with the figures that are difficult to explain, and offering cautiously couched speculation that the experiments have been cooked, or the data manipulated.

Were such a charge substantiated, how much of this group's work product would then be at risk? Who if any among 20 or so coauthors on over 15 papers might be a coconspirator? These are among the questions swirling about amid a cloud of rumor and speculation.

In fact, those questions can't be answered, because we just don't have the whole story. Bell Labs management has appointed a review committee chaired by Professor Malcolm Beasley of Stanford to look into the matter. It is a distinguished group and can be counted on to do a careful job. Unfortunately, it does not expect to conclude its work until summer's end—a long interval, allowing for unlimited speculation and guesswork. So the topic will hang in the air, continuing to command media attention—and ours.

Trust is a shared value of science.

The topic of scientific fraud has had a bumpy and disappointing history. Concerns that surfaced in the 1970s and '80s, sometimes by congressional overseers of federal research budgets, at first met with skepticism on the part of science leaders. National Academy of Sciences president Philip Handler, among others, argued that it was so rare that we shouldn't bother ourselves. But a few clear cases, and an opportunity to grab headlines, persuaded some in Congress to demand more vigilance by the granting agencies—which responded, as agencies will. The result was a mixed bag: The Orwellian-named Office of Research Integrity at the National Institutes of Health (NIH) found some miscreants, but also committed the farrago of errors that led, in the case of Imanishi-Kari, to a reversal. This deferred justice ended years of undeserved opprobrium for her and for her senior colleague, David Baltimore.

That painful lesson and others made it clear that suspicions of this kind require cautious and considerate handling. Thus it would be unfairly premature to judge the Schön case: Bell Labs has done the right thing in appointing a strong outside committee to examine the matter, and *Science* will await its findings before saying anything about the work we have published from this group.

But other questions arise that can be answered now. We have been asked, for example, whether if there were a finding of misconduct, it would raise questions about the quality and reliability of the peer review process applied to the Schön papers. It wouldn't, because peer review has never provided immunity against clever fraud. Last year, an author had to retract a paper because of data manipulation by a participant in the experiment. In an accompanying editorial, I wrote: "...many years ago, George Price...pointed out that although science had developed robust ways of controlling chance, it had invented scant protection against fraud. A clever laboratory cook can invent data that are immune to vigilant reviewers and to any diagnostic test save repetition, the only proven scientific remedy."

There is nothing "wrong" with the peer review process, and there is little journals can do about detecting research misconduct. Other nations (Germany, China) are developing standards for recognizing and punishing scientific fraud—but these plans do little by way of prevention. In the United States, the NIH requires that universities training fellows have courses dealing with research ethics. Having taught in one, I like the idea; and although we still lack outcome data, this approach at least attempts to deal with the problem prospectively.

So we should teach young scientists about the importance of bringing honesty as well as care to our craft. But when research finally reaches the journal in the form of a paper, we can't count on the review process to detect manipulated data. Science is a community venture dependent upon shared values, and trust is one of them. In the end, that's where we have to put our faith.

Donald Kennedy