Misconduct: Views From the Trenches

For universities, investigating their own has proved a minefield, but a few have set up misconduct programs that work—and provide models for coping with the issue

Most of the time, C.K. Gunsalus finds herself "separating smoke from fire." The associate vice chancellor for research at the University of Illinois at Urbana-Champaign, Gunsalus estimates that 20 to 40 students and researchers approach her each year with a complaint. Most of them, she says, have had a personality conflict with advisors or colleagues and are simply looking for advice and a shoulder to cry on. "Quite often," she says, "I make a suggestion, they go away, and I never hear from them again."

Three to five times a year, though, there's some real fire: an allegation of plagiarism, falsified data, or other fraud serious enough to require an inquiry. And three times in the 4 years since the program was set up, the result of the inquiry has been a formal investigation into scientific misconduct. Unlike many university misconduct investigations, however, those at Illinois have not found their way into either heated congressional testimony or embarrassing press coverage.

Universities have been stumbling through alien territory as they try to respond to allegations of scientific misconduct among their faculty. The 1980s were marked by highly publicized failures like the investigations of immunologist Thereza Imanishi-Kari by Tufts University and the Massachusetts Institute of Technology (MIT) (which exonerated her but were later reversed by federal investigators) and Harvard's inquiry into medical researcher John Darsee (where the investigators vastly underestimated the extent of fraud). Such public bloodletting has prompted commentators and congressmen to question whether the universities are capable of investigating their own.

The potential damage from botched investigations can be enormous. For one thing, explains Drummond Rennie, a professor of medicine at the University of California, San Francisco (UCSF) and a deputy editor of the *Journal of the American Medical Association*, "Nothing stinks more than the hint of an investigation that was biased or suppressed." The financial stakes are rising, too: In a case that will soon go to trial, the government is suing not only John Ninnemann, a researcher charged with misconduct, but also the two universities involved—the University of Utah and the University of California, San Diego (UCSD)—to recoup $1.3 million in grants from the National Institutes of Health (NIH). And since 1989, the universities have had a legal obligation to do a better job: The Public Health Service (PHS) has required that universities receiving NIH funding have a set of procedures for handling allegations of misconduct promptly and effectively. Yet many universities are still fumbling. At Michigan State University, for example, where a conflict between a faculty member and a graduate student grew into a lengthy imbroglio, an outside committee concluded earlier this year that university officials made elementary mistakes in handling the affair (*Science*, 29 January, p. 592).

SPECIAL NEWS REPORT

Is the intramural program of the National Institutes of Health losing its luster? A special report begins on page 1120. News & Comment and Research News coverage is combined into a single section for this issue.

The problem, says Paul Friedman, dean for academic affairs at the UCSD medical school, is that "we are essentially developing a whole new canon of law without actually setting about it systematically." It's a field that is crying out for models. So *Science* asked 20 university and federal officials, attorneys, and researchers who have taken part in misconduct investigations to name the universities they think have a reasonable track record in handling misconduct charges. Along with the Illinois program, those at UCSF and at Harvard Medical School—set up in the aftermath of the Darsee case—come up repeatedly. But since one sign of successful programs "is that they have not made their way into the public domain," points out Barbara Mishkin, a Washington-based lawyer who has handled many misconduct cases, these three universities are surely not alone—nor are they infallible.

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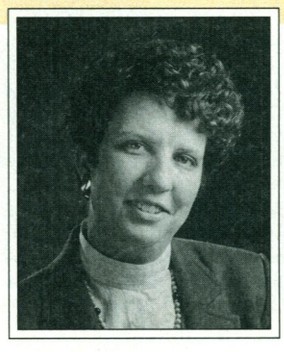
—C. K. Gunsalus



All three, however, have features that outside observers say are crucial: an active program to educate faculty, researchers, and students about misconduct and the procedures for reporting it, a carefully thought out protocol for dealing with allegations, and—perhaps most important—administrators running their programs who are experienced, dedicated, and prepared to devote time to misconduct issues. Says Nelson Kiang, former chairman of the committee on discipline at MIT and a medical researcher at both MIT and Harvard, "You can take a terrible system and if you put the right people in it, they'll somehow see something decent comes out of it." But better still, he says, is a system that "won't require an excessive sacrifice on the part of the members to do right."

Getting the word out

Education is key to such a system, says Eleanor Shore, dean for faculty affairs at Harvard Medical School, because it can deter potential offenders. "When you realize the loss of time and faculty effort in an investigation, you realize that prevention is by far the better way," says Shore. At Harvard, she says, "faculty committees have developed guidelines for investigators in scientific research, in clinical research, and for authors and editors of textbooks." When charges of misconduct do come up, Mishkin adds, they are much easier to deal with if standards for responsible research have been established in advance. Karl Hittelman, UCSF's associate vice chancellor for academic affairs, attributes the success of the UCSF program in part to publicity in newsletters, faculty development programs, and faculty handbooks. At Illinois, Gunsalus is prominent on campus giving lectures and seminars on the program. Such efforts, says Kiang, also send a signal to researchers and stu-

ILLUSTRATION: L. OWENS

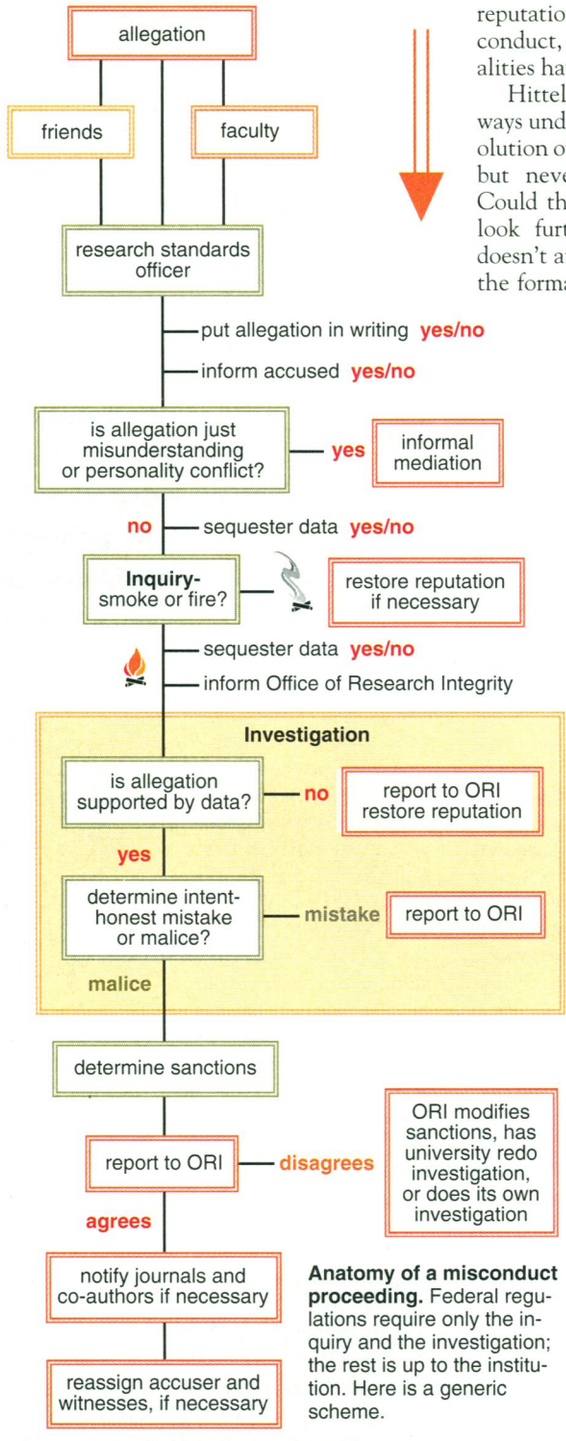
dents that if they come forward with concerns about misconduct, they won't "get clobbered," as he puts it—unlike, say, Margot O'Toole, the MIT researcher who first raised questions about the work of Thereza Imanishi-Kari in 1986. Although O'Toole's concerns were borne out in a draft report of a federal investigation, she lost her job in the meantime.

Besides reassuring potential whistleblowers that they won't meet the same fate, a successful system opens many different channels for reporting complaints. "The greatest fear of people who report incidents of misconduct," says Patricia Woolf, who lectures at Princeton on responsible conduct of research in molecular biology, "is that they will report it and nothing will be done. Having multiple entry points makes it easier for people to express their concern and for that concern to get to a place where a reasonable person will evaluate it seriously."

At UCSF, says Hittelman, researchers can take their allegations to whomever they feel most comfortable with—"your mentor, your dean, if you're a faculty member, or directly to me, or to the chancellor, or somebody in central administration." Ultimately, though, all charges are funneled to the dean of the school involved, at which point Hittelman learns of them. At Illinois, while many students and researchers take their concerns directly to Gunsalus, they may also choose to go to someone in their department. These complaints, too, ultimately reach Gunsalus. This way, says Gunsalus, the system has "multiple entry points but also some institutional central repository," along with built-in mechanisms to prevent accusations from getting "lost."

Separating smoke from fire

The flip side of encouraging students and faculty to complain about potential misconduct is the need to filter out the many complaints that are really what Hittelman calls "divorce court proceedings." These, says Hittelman, "are serious personality conflicts between students and professors, fellows and mentors, two professors who have had a falling out. These volatile personality conflicts can escalate to the point where people make rash accusations"—as they did at Michigan State in 1989 when Jeffrey Williams, a faculty member doing research on tropical diseases, fired a student researcher with whom he felt he could no longer work. The student responded by taking primary data out of the laboratory and refusing to return it. What might have been settled through thoughtful mediation, say outside sources, grew into a 4-year fiasco, still unresolved, in which misconduct charges were filed by the student against Williams—and by Williams against the student, her faculty advisors, and the administration.



Anatomy of a misconduct proceeding. Federal regulations require only the inquiry and the investigation; the rest is up to the institution. Here is a generic scheme.

At Illinois, says Gunsalus, she and her colleagues try to handle apparent personality conflicts in an "informal way," without cranking up an official misconduct proceeding. Deciding when to forgo an official inquiry is a tricky judgment call, Gunsalus admits. "The factors to be considered include the seriousness—or potential seriousness—of the allegations, and the history of questions about the conduct of the individual concerned." She adds that "caution is essential. Even professionals with outstanding reputations have been found guilty of misconduct, and accusers with unstable personalities have been correct."

Hittelman echoes that caution: "We always undertake to achieve some kind of resolution of interpersonal problems if possible, but never without asking the question, Could there be misconduct here? Must we look further?" But UCSF, like Harvard, doesn't attempt to settle that question until the formal inquiry mandated by PHS regulations gets under way.

Gearing up an inquiry

That's the next step, if the allegations are deemed potentially serious. At that point, a thorny procedural question comes up: whether or not to sequester disputed data. "A common denominator in a lot of these cases," explains Shore, "is loss of data. If it's your first time on an investigation panel, you may think, 'Isn't that a terrible mishap,' but after you've examined the national experience and seen all the different ways that accused individuals can explain their loss of data you begin to get very cynical." (Hittelman tells of one case in which a researcher asserted that the missing data had come from experiments conducted by other people. It later turned out, however, that one of the researchers named had left the university before the experiments were supposed to have been done. The original data, in fact, were nonexistent.)

At Harvard, Shore says, she and her colleagues have concluded that there's no alternative to locking up the original data, drastic though that step may seem. (Copies are available to the accused researcher for use while the investigation is under way.) "You appear to be invading somebody's scientific world," she says. "The point has to be made that it's in their best interest. If they are being falsely accused, it will be to their advantage to have data acquired immediately, examined, and found to be in good shape. The longer they hold it, the easier it is for someone to accuse them of altering the data."

UCSF administrators, on the other hand, are loath to sequester data unless it is absolutely necessary. "We have had long, anguished discussions about that particular issue," says Hittelman. "When do you lock down the lab? You're walking a very, very fine line between protecting the data and

evidence, and running a serious liability. You try to sequester somebody's materials or lock a freezer, confiscate a series of gels, whatever it may be, and that person turns out to be innocent of charges, and you have a little bit of a legal thing on your hands." Only after the initial inquiry will Hittelman and colleagues consider sequestering the evidence.

Who should judge?

The inquiry is also the stage at which Hittelman and his counterparts start to worry about the potential for a whitewash. To Gunsalus, the problem is that misconduct cases—fortunately—are so rare that the scientists who serve as panel members in inquiries and investigations are usually novices, and thus tend to fall victim time and again to a natural inability to see misconduct when it is committed by their peers. "There are always scientists who can't believe in the possibility of fraud," adds Rennie, who is a member of the PHS advisory panel on scientific misconduct. "They seem to think that having a scientific degree confers infallibility or rectitude. With each misconduct investigation, you have to educate a whole lot of people."

Such was the case when John Darsee, a young researcher who had come to Harvard from Emory University Medical School, was observed falsifying data in 1981, a charge to which he admitted. Separate investigations by Darsee's Harvard co-authors and a faculty panel looked into the possibility of further fraud but found no evidence of it, at least in the work done at Harvard. The embarrassing reality, as a lengthy NIH investigation discovered later, was that Darsee had deliberately falsified much of the data in his many publications.

The Darsee case was Harvard's epiphany, says Shore, after which it began developing institution-wide procedures for dealing with misconduct. "I think it really didn't occur to any of the first team of investigators that someone would willfully falsify or fabricate research data," she recalls. "There was a giant maturational spurt there when it became clear that someone would have so little regard for the scientific process."

Shore, her staff, and the university counsel provide one safeguard against naivete and natural sympathy for a fellow scientist. They assist each inquiry or investigation panel, ensuring that procedure is followed and everyone is treated fairly. Gunsalus and Hittelman, and their staffs, serve these roles at Illinois and UCSF. These administrators also watch over the selection of the faculty panels that carry out the inquiries or investigations, paying special attention to the panelists' stature and relation to the accused person, as well as their ability to evaluate the evidence. (Two of the four UCSF schools have set up standing committees to handle inquiries, but at Illinois and Harvard, each inquiry panel is chosen afresh, and that's true of investigation panels at all three schools.)

"Certainly you need expertise," says Lyle Bivens, acting director of the PHS Office of Research Integrity, "and you need people who do not have any conflict of interest, that is, who haven't been in a close professional relationship, co-author, collaborator, or anything like that." Gunsalus agrees: "We often find that it's not feasible to have someone from inside the department because of bias and connections." It's also important, says Gunsalus, "to match the power level of the faculty member you're inquiring about."

If an inquiry leads to a formal investigation—the next step mandated by the PHS—considerations of conflict of interest become even more pressing. Says Bivens, "We believe it's important not to have somebody even organizationally close. If I were running an investigation, I'd look very hard for outside people, not on the faculty of the university itself." In fact, the Illinois and UCSF procedures both require that an investigation panel include a researcher from outside the university; Harvard has concluded that, with 17 associated institutions, it can draw on a large enough pool of disinterested researchers without looking elsewhere.

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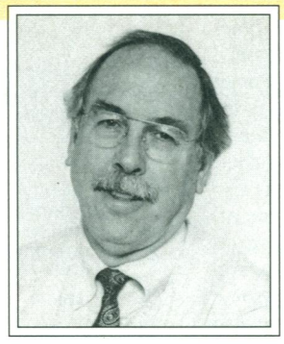


Incompetence or intent?

After investigators have completed their fact-finding, they face the biggest stumbling block of all: establishing intent. The challenge, as Rennie puts it, is finding "the line between incredible incompetence and criminal incompetence." As a recent report on fraud in science produced by the Office of the Inspector General at the National Science Foundation described the problem, "Many university panels do not show any clear idea of what would be needed to prove intent.... If a university panel employs a stringent standard of proof and believes in addition that it must prove intent according to that standard, it will often find that it cannot reach a conclusion about intent."

And that derails many investigations, because panelists tend to believe that evidence of intent is necessary for a finding of fraud, the report notes. "They often announce after long, inconclusive discussion that they have not found such evidence, and that therefore plagiarism, or whatever is at issue, cannot be proven.... In this way, cases that are clearly misconduct in science in terms of the overt evidence may lead to findings of no misconduct by the university because of the unresolved question of intent."

Indeed, says Princeton's Woolf, "it's a natural human tendency to find an excuse for people that you like, and people you've been working with for a very long time. It has unfortunately not been so difficult in these cases to attribute malicious intent to the accuser while attributing benign intent to the accused. Most scientists would not attribute intention to anyone without evidence, but they seem more willing to assert no intention when they have no evidence for that either."

The Harvard prescription for dealing with intent, says Shore, is simply to "get a faculty standing committee to make the best judgment they can about the facts," then have the panelists consider "the likelihood that this could happen without intent." Gunsalus, too, advises investigators at Illinois to end-run the intent problem by concentrating on establishing the facts first. "First you have to establish whether the alleged problem did or did not occur," says Gunsalus. "If it's a plagiarism case, are the words present in one document, and present in another without attribution or citation; if it's fraud, are the documents substantiated, are data substantiated?" Afterward, the panel can turn to the question of intent and mitigating circumstances—issues that will affect the fate of the accused when the faculty panel passes on its findings and recommendations to the university administration.

Dealing with the aftermath

A misconduct proceeding isn't done, however, when the investigation is concluded. There remains the issue of publicizing the outcome. As a model, many commentators point to UCSD's response when a faculty committee found medical researcher Robert Slutsky guilty of fabricating data (*Science*, 31 October 1986, p. 534). The university officially retracted all articles in which the data could not be firmly substantiated by co-authors on those papers. "Why uncover a fraud?" Woolf asks. "One of the answers is because you really don't want other hard-working, conscientious scientists to be misled by something in the literature." Rennie

says that publicizing a finding of guilt is a matter of principle. "Secrecy has proved to be the enemy of justice," he says. "Moreover, there are quite enough cases where people have committed misconduct and have gone on to commit it elsewhere to show that it's a bad idea not to make findings public."

At Illinois, the results are kept quiet only if the investigation concludes that no misconduct was committed and the allegations haven't been aired already. (If someone—say the whistleblower—has publicized the accusations, the exoneration will be publicly announced as well.) UCSF likewise tries to communicate findings of misconduct, first by notifying the journals, then the faculty and the community. It's not always easy, notes Hittelman, who has met with resistance from lawyers for the accused, from the university, and even from the journals. In one case, the journal in which the original paper appeared was willing to announce the finding of misconduct. But the university's general counsel raised legal concerns and instead insisted that the retraction say only that the paper's data could not be substantiated, without mentioning misconduct. "I find that very troubling," he says. "Here we are with a very carefully examined instance of an individual having committed scientific misconduct, and we're being thwarted from coming out and saying that."

The other challenge at the conclusion of a misconduct investigation, says Shore, is the process of healing. However the investigation ends up, someone—the accuser, a researcher who was falsely accused, or even researchers called as witnesses—will need to be "made whole," in Shore's words. Often this entails transferring researchers to other labs, while assuring the continuation of their salary and research. "If you have brought an allegation against people you're working with," says Shore, "you can't go back in the lab easily and say all is forgotten. Sometimes [people] just have to be separated."

Gunsalus tells of one such incident at Illinois, when a student came forward with an allegation that turned out to be groundless. At the same time, she says, based on the information at hand "it was absolutely proper and appropriate for him to do what he did. He was just wrong, and we ended up moving him to another department, because the person wrongly accused was extremely upset, as one might imagine."

Everyone agrees that that kind of risk is unavoidable with a topic as thorny as misconduct. "It's a very treacherous business," says UCSD's Friedman. "No one loves you for dealing with these cases." And no protocol or procedure handles all contingencies well. Adds Gunsalus, "Every time you do one of these, you encounter new problems and new ways to do it wrong. What we have is a framework that tends to work for us. It's not a problem-free process, but we work pretty hard at thinking these problems through."

–Gary Taubes

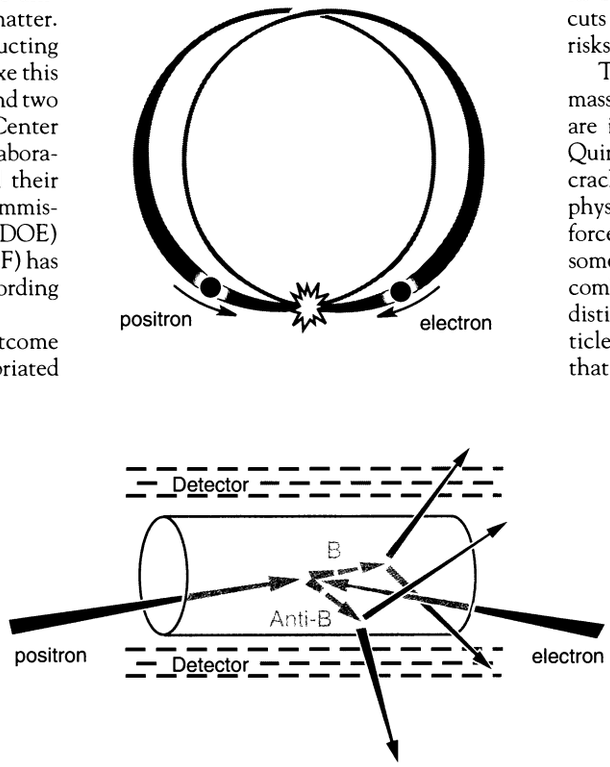
HIGH-ENERGY PHYSICS

Cornell Leads Battle of the B Factories

These are lean times for particle physics, and the stakes have never been higher in the competition over who will get to build scarce new facilities. The fiercest battle is now raging over the B factory, a $100 million to $200 million particle accelerator that promises insight into such questions as why the universe contains more matter than antimatter. Other than the $11 billion Superconducting Super Collider, which Congress may axe this year, it's the only big project in sight, and two labs, the Stanford Linear Accelerator Center (SLAC) and Cornell University's Laboratory of Nuclear Studies, have staked their futures on building it. A report commissioned by the Department of Energy (DOE) and National Science Foundation (NSF) has just strengthened Cornell's hand, according to some who've seen it.

For physics as a whole, a happy outcome is likely: The House has already appropriated money for the project, and sources at the Office of Science and Technology Policy and DOE doubt that the Senate will delete the funding. But for SLAC—which has been teetering near extinction since its last big project, the Stanford Linear Collider, proved a disappointment (*Science*, 24 April 1992, p. 432)—the prospects of losing this prize are painful to contemplate. Many physicists fear that it would spell the end of this world-renowned facility.

DOE is closely guarding the report of the 12-person review panel, headed by Massachusetts Institute of Technology physicist Stanley Kowalski, pending a verdict by DOE Secretary Hazel O'Leary, who may make the decision along with presidential science adviser Jack Gibbons. But directors at both labs say they've seen the report, completed last month, and they confirm its bottom line: Although it makes no recommendations, it says both proposals are workable but Cornell's, as advertised, will cost much less. That appears to support a public claim by the Cornell laboratory, now the world leader in studies of the B particle, that it can build a B factory for just over half the price of the SLAC proposal. But the SLAC team is doing its best to argue that the Cornell proposal cuts too many corners and takes too many risks to be considered a bargain.



SOURCE: CORNELL

Catching B's. In a B factory, counter-rotating beams of positrons and electrons will collide, generating B and anti-B particles whose decays should hold clues to new physics.

The goal of both designs is the same: mass-producing short-lived "B" particles. B's are in demand, says SLAC theorist Helen Quinn, because their decays may reveal cracks in the so-called Standard Model, physicists' working picture of matter and forces. Most subatomic processes conserve something called charge-parity (CP)—a combination of charge (the property that distinguishes particles from their antiparticles) and parity (a kind of "handedness" that distinguishes a particle from its mirror image). But the Standard Model makes room for a small amount of CP "violation"—and predicts it should show up in the decays of B particles.

Physicists suspect, however, that something is wrong with the Standard Model's prediction. Subatomic processes that violate CP conservation affect matter and antimatter differently, so physicists believe CP violation is the reason the Big Bang produced a universe that contains more matter than antimatter. But the amount of CP violation predicted by the Standard Model is too small to account for all the matter we see around us. Something is fishy in the