SCIENTIFIC MISCONDUCT

After 9 Years, a Tangled Case Lurches Toward a Close

Early in 1987, Steven Barlow, a former graduate student at the University of Wisconsin, Madison, noticed something odd in a paper published in the journal *Neurology* by his thesis adviser, James Abbs. The paper described measurements of the impairment of facial muscles of patients with Parkinson's disease. But when Barlow switched two of the three panels in Figure 1—corresponding to the lip, jaw, and tongue of a subject—he found that the figure bore an uncanny resemblance to one he and Abbs had published 4 years earlier. The major distinction was that the graphs in the *Neurology* paper were smooth, while the 1983 graphs had jagged lines, which were the telltale signs of Parkinson's tremor.

On 9 April 1987, Barlow distributed a letter to officials at the University of Wisconsin (UW), the National Institutes of Health (NIH), and two journals, accusing Abbs of simply tracing over the 1983 figure and smoothing out the curve. That letter led to a series of misconduct inquiries, a lawsuit, a stinging judicial opinion of the federal government's due process procedures, sharp exchanges between UW officials and federal investigators, and reams of investigative reports and analyses. And the fallout from this case may not be over yet.

Last month, the Office of Research Integrity (ORI) overturned four previous not-guilty findings by announcing that Abbs "intentionally falsified and fabricated" data in the *Neurology* paper. Abbs, who denies the charges, has agreed not to appeal—the financial and personal strain would be too great, he says—in return for avoiding the risk of debarment from government grants and a chance to rebut the charges in writing. But Abbs submitted a rebuttal that was so strongly worded that ORI officials were unwilling to accept it, claiming that it makes "ad hominem" attacks on the agency. Abbs now says that ORI is violating the agreement.

This roller-coaster saga offers a rare glimpse into the ORI's controversial investigative procedures, such as the use of statistical analyses as evidence of guilt—a key aspect of ORI's ongoing and most celebrated case, involving immunologist Thereza Imanishi-Kari. And the fact that it has taken more than 9 years to determine the legitimacy of a single contested figure is a telling statement about the difficulties of resolving these kinds of cases. To Abbs, the long-drawn-out process is evidence of ORI's incompetence. But ORI acting director Chris Pascal blames the delay on Abbs's civil suit and a large but shrinking backlog of accusations that his office has to investigate.

End of a dynasty. When Barlow sent off his letter 9 years ago, Abbs was a giant in the small confines of the speech and motor control community. He held two program project grants which brought in more than $2 million a year to the university and employed 30 people. "A lot of people were jealous of Jim," says Michael Caliguiri, a former graduate student of Abbs. "He basically built a dynasty." No longer: His NIH grants have expired, and he now supervises but a single graduate student. Abbs admits to being so embittered by the 9-year probe that he no longer even bothers to apply for federal grants.

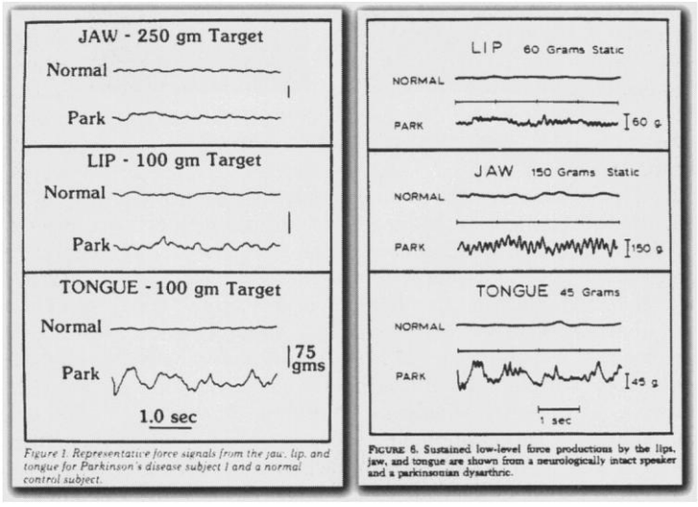


Figure 1. Representative force signals from the jaw, lip, and tongue for Parkinson's disease subject 1 and a normal control subject.

FIGURE 6. Sustained low-level force productions by the lips, jaw, and tongue are shown from a neurologically intact speaker and a parkinsonian dysarthric.

The heart of the case. Tracings published by James Abbs in 1987 *(left)* bear a striking resemblance to a figure he published 4 years earlier.

Barlow's letter prompted two inquiries in Wisconsin, one at the university and another at the Gundersen Clinic in Lacrosse, a 2-hour drive away, where Abbs had gathered data with his two co-authors. Abbs admitted that he could find no data for the contested figure nor for much of the rest of the paper. Nor were data in the lab's computers, because, he told the university panel, he had used 20-year-old equipment at Gundersen and noncomputer analytical techniques. The data that Abbs did find concurred generally with his published results, however, and panels at both institutions concluded by August 1987 that he had no motive for fabrication.

NIH's Office of Extramural Research then convened its own internal panel to review these institutional reports. The panel "concurred ... that there was no misconduct," according to a 24 March 1988 summary document. But the matter didn't end there. NIH physicist Charles McCutchen learned of the case from NIH's self-styled fraud-buster Walter Stewart and made it a personal crusade—"I kicked, yanked, hit, bit, and scratched," McCutchen says. On 12 April, Stewart testified about the Abbs case and others relating to scientific misconduct before a congressional hearing convened by Representative John Dingell (D–MI). Six days later, NIH announced that it was launching another inquiry of Abbs.

McCutchen presented this second internal panel with a calculation that the odds of Abbs's figure being legitimate data were astronomically low. But the panel was unimpressed. It asserted that the university had correctly dismissed the relevance of this kind of calculation because a proper analysis would require a full data set and have to take into account "some very complex considerations of statistics, sampling, physiological events, and instrumentation." On 11 August, the panel recommended in writing "that NIH reaffirm its previous acceptance of the University of Wisconsin report exonerating Dr. Abbs."

A high-level NIH committee began another review in late 1988 by soliciting opinions from six outside experts in biostatistics and signal processing. After various bureaucratic shuffles, this review transformed into an investigation by the ORI. It was interrupted in 1990, however, when Abbs filed suit against the agency for lack of due process. U.S. District Judge Barbara Crabb declared from the bench that she was "appalled" that the ORI's due process procedures "were the work of amateurs," and the ORI was forced to publish and adopt standards. As the case wended its way through an appeal, the Abbs investigation sat dormant until 1992.

After 4 years of investigation, the agency announced last month that Abbs "intentionally falsified" figure 1 and "intentionally falsified and fabricated" data in another figure. The report states that Abbs "intentionally falsified" the protocol he used in taking data and did not produce data for figure 2 because "it is not believable that Dr. Abbs would have invested such a large amount of

his time [estimated to be 100 or more hours over a 30-month period] on such tedious work."

It also argues that Abbs had misreported the identity of the subject described in figure 1. The report says that the subject's true identity was discovered by ORI investigators in an early draft of the paper which described tests on a woman, not a man, as the final version stated. The report also highlights what it calls a career-long, "extensive pattern of misrepresentation" by Abbs.

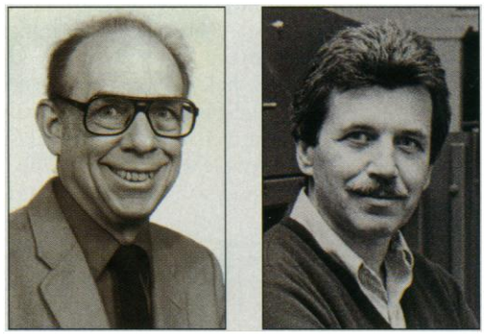
The centerpiece of the ORI report is statistical analyses performed by ORI investigator James Mosimann, a biostatistician who was hired by the office at the suggestion of Stewart. Mosimann had earlier consulted informally for McCutchen on this very case. The ORI report contends that the odds are "essentially zero" that the three curves in the disputed figure 1 could have been generated legitimately. Furthermore, ORI concludes that certain handwritten data, which Abbs had submitted to the university review panel to bolster his published claims, were in fact "fabricated." ORI determined this by counting the relative frequency of insignificant digits appearing in these data. ORI found a relative surplus of 1's, 2's and 3's and a relative deficit of 0's, 4's, 7's and 9's—a 1 in 100,000 occurrence if these digits had been authentic, ORI asserts.

ORI acting director Pascal says that his agency agreed to a settlement with Abbs on 28 March (an announcement was published in the *Federal Register* on 9 April) to resolve a long-standing case and because the alleged fraud was "not ground-shaking by any means." The settlement includes a requirement that Abbs will "voluntarily" exclude himself from serving on Public Health Service panels for 3 years and requires Wisconsin to provide "supervision ... to ensure the scientific integrity" of his federal grants. In return, Abbs avoids possible debarment and gets his rebuttal of the charges placed in the official file. The agreement also requires notification of *Neurology*, but not retraction of the article. Robert Daroff, the journal's editor in chief, says: "If Abbs doesn't, I will retract."

Abbs strikes back. The settlement held firm until Abbs submitted his 13-page, single-spaced rebuttal on 22 April. It was not what ORI was expecting: It was a stinging assault on the ORI and its charges. Abbs states that he settled only to put "an end to almost a decade of harassment." He notes: "Most issues in this dispute come down to credibility ... ORI's credibility as well as my own," and proceeds to quote from 1993 rulings by the Departmental Appeals Board—a panel of judges that hears appeals from accused scientists—which said that ORI investigators "equate speculation and rumor with evidence," "rely on misinformed or biased testimony," "misquote witnesses and misstate evidence," and "use testimony from witnesses that are not competent or credible."

Abbs accuses the ORI of doing all these things, and more. He complains, for example, that the ORI relies on the expert opinions of witnesses with a "strong and on-the-record vested interest in the outcome of this dispute." And he contends that ORI ignored eyewitness testimony from his two co-authors and documents—including a signed human consent form—that proved "directly and unequivocally" that he followed the protocol he claimed and did not misrepresent the identity of a patient.

In his rebuttal, Abbs bristles at the ORI's suggestion that he has engaged in a pattern of misrepresentation over his career. He states that ORI is "simply misinformed" when it cites as an example two scientific studies which disagreed with other papers of his, because "there are far too many probable and simple explanations for lack of replication in a human clinical study." (A co-author of one of these conflicting studies, University of Iowa speech physiologist Erich Luschei, says that he agrees that ORI "reached an unjustified finding" in the use of this example.)



No love lost. Charles McCutchen (*left*) urged NIH to continue investigating James Abbs (*right*).

Abbs seeks to turn the tables by accusing ORI officials of inconsistencies and misstatements. He notes that Suzanne Hadley, the agency's former deputy director, stated in his civil suit that NIH "neither concurred with nor accepted the findings of the Wisconsin Committee." And the ORI report itself lists Abbs's claim to have been found innocent as part of his "pattern of public misrepresentation." Yet Abbs includes documentation in his rebuttal that NIH's reviewers first "concurred with [the] institution's findings that there was no misconduct" and then later "reaffirm[ed] its previous acceptance of the University of Wisconsin report exonerating Dr. Abbs." However, Hadley says, "I am absolutely confident in the accuracy of my declaration."

On the matter that has been at the center of this dispute, Abbs stands by his initial explanation: that the resemblance between figure 1 and the one published earlier can be explained by the similarity in experimental design, patient history, and data selection in the two studies. As corroboration, he points to another data curve purported to be from the tongue of a patient described in figure 1. Although different, it also resembles the other two tongue curves.

NIH biostatistician David Alling, who served on the ORI's scientific advisory panel, says that he found the reports of the statistical experts NIH asked to review the data to be quite convincing. The experts individually estimated the chances of the figure's legitimacy to range from 1 in 10 to 1 in a trillion. "Abbs doesn't understand the math," Alling says.

But Abbs is supported by Terry Speed, a University of California, Berkeley, biostatistician who has lectured about ORI's methods after serving as a defense witness on the Imanishi-Kari case. Speed says that the fact that the reviewers can't agree on the proper method for estimating the chances of the figure's legitimacy shows that statistical methods are useless in this debate. For the ORI to expect otherwise "seems very unfair to the reviewers and to the accused," he says.

As for the ORI's conclusion that the irregularity in the digits found in Abbs's handwritten data show fraud—the same conclusion that the office reached in the Imanishi-Kari case—Speed says that the published literature proves only that people make up nonrandom data, not that nonrandom data is a sign of fraud. "Data can look like it's made up for all kinds of benign reasons," he asserts.

ORI's Pascal says he cannot respond to specific complaints about his office's report without more analysis of the details. But he says the use of statistics is a proven investigative tool, and "we usually use it in addition to other evidence." And he asserts that Abbs's comments about his office are totally out of line. Pascal says that the agreement simply allowed Abbs a "rebuttal on the merits rather than personal attacks."

Last month, ORI attorney Steve Godek demanded of UW attorneys that Abbs retract his letter or risk reopening the settlement agreement. This demand, Abbs claims, is one of a string of ORI actions that violate the settlement. Nevertheless, he has submitted a rewritten rebuttal with a less confrontational tone, and ORI said last week that it accepts this second effort.

The only question that remains now is whether both sides will be content to lick their wounds and walk away from this bloody 9-year battle. Perhaps not: ORI asserts that it will now rebut Abbs's first rebuttal, as *Science* has a copy of it, and Abbs says that if fly-fishing doesn't distract him, he may take his fight against ORI into a political arena.

–Jock Friedly

Jock Friedly is a writer in Arlington, Virginia.