# OFFICE OF INSPECTOR GENERAL

# SEMIANNUAL REPORT TO THE CONGRESS

Number 1

April 1, 1989 - September 30, 1989

National Science Foundation

### *Scientist Censured for Misrepresenting Preliminary Scientific Findings in Grant Application*

An assistant scientist with a northwest research institute agreed to be declared ineligible for funding as a principal investigator after an internal review committee convened by his research institute found a pattern of repeated misrepresentation of data in his proposals for research support. The grant application, which was also submitted to the National Institutes of Health (NIH), was the scientist's first independent attempt at obtaining federal funds for his research program.

An inquiry was initiated after Foundation staff, who were evaluating the scientist's proposal for funding, discovered apparent misrepresentations of preliminary data in photomicrographs and reported the inconsistencies to the OIG. An initial inquiry conducted by administrators at the scientist's research institution supported a formal investigation of the matter.

An internal review committee convened by the scientist's research institute agreed unanimously that a pattern of repeated misrepresentation of data was apparent, suggesting serious misconduct by the scientist and/or his inability to meet the professional standards and quality control expected of a scientist with the training he possessed. The scientist was provided an opportunity to respond both to the internal review committee's findings and OIG's proposal to censure him by declaring him ineligible for funding as a principal investigator for a period of five years. While denying wrong-doing or guilt, the scientist admitted to carelessness in preparing the grant applications which he attributed to personal problems and poor laboratory administrative practices. The scientist's resignation from the research institute obviated the need for disciplinary action on the part of his employer.

The Public Health Service's Office of Scientific Integrity is conducting its own inquiry into work by this scientist which may have been funded by or submitted to NIH through or along with others.

# OFFICE OF INSPECTOR GENERAL

# SEMIANNUAL REPORT TO THE CONGRESS

Number 3
April 1, 1990 - September 30, 1990

National Science Foundation

# OIG Procedures for Misconduct Allegations

We prepared a letter for distribution to the science and engineering community that describes procedures followed on receipt of an allegation of misconduct in science, engineering, or education. Our letter both explains our procedures and affords scientists and engineers an opportunity to respond with comments and questions.

Our letter notes a frequent need to clarify an allegation in order to determine whether it falls within the NSF definition of misconduct, whether it concerns NSF, and whether there is some evidence supporting it. If these conditions are met, our standard practice is then to contact the subject of the allegation, asking for comments or an explanation, before contacting any third parties. This practice helps to ensure that the subject's reputation is not compromised by our preliminary proceedings. If the subject's explanation resolves the matter, the case is closed at that point.

Many allegations, however, will require probing beyond this stage by means of a preliminary inquiry or a formal investigation conducted by OIG or by the cognizant institution. It is our practice, unless there are strong reasons to the contrary, to defer these proceedings to the subject's institution. Our letter emphasizes OIG's concern that subjects, complainants, and witnesses be accorded fundamental fairness and due process by both OIG and by any institution to which OIG may defer an inquiry or an investigation. Our initial effort to meet this concern is OIG's review of an institution's published policies and procedures for conducting an inquiry or investigation into alleged misconduct. Later, by carefully reviewing inquiry and investigative reports, OIG can verify the adequacy of the procedures actually used by institutions in evaluating complaints of misconduct referred to them. Finally, OIG solicits comments by the subject before an investigative report becomes final.

Our letter also addresses questions about what information is made publicly available on misconduct cases. While a case is open, OIG neither confirms nor denies its existence, and does not give out information about the conduct of the case. This practice provides the confidentiality necessary to conduct an adequate inquiry or investigation and protects the subject's good name in case the allegation is false. Our letter also mentions our standard practice of providing informants with "confidential informant" status, whenever requested, in order to minimize the chance that reprisals will be taken against an individual who, in good faith, provides information about alleged misconduct. Closed out cases are subject to requests under the Freedom of Information and the Privacy Acts.

# NSF Staff Handling of Misconduct Allegations

We prepared a bulletin (OIG Bulletin 90-02) for distribution to NSF staff that sets forth the procedures that staff members must follow whenever they beome aware of possible misconduct by someone who has an NSF award or has submitted a proposal.

The basic requirement is that staff must inform OIG of any misconduct allegation immediately. The bulletin emphasizes that OIG heavily depends on program staff to bring such allegations to its attention and to provide expert help as it resolves them. Program staff, like OIG staff, are required to maintain strict secrecy about allegations, and may not give information about them to persons outside the Foundation. Program staff may not conduct their own inquiries into allegations and may not take adverse actions against investigators on the basis of such allegations.

# A Sample of Misconduct Cases

## *Debarment Recommended for Misconduct*

OIG has recommended that a researcher be debarred from receiving grant funds from the federal government for a 3-year period. The subject involved is a biological scientist who directed research at a field site in a foreign country with funding from NSF's Research Experiences for Undergraduates program. The funding included support for undergraduate students sharing in the research at the site and working with the researcher afterward to analyze the data collected.

In November 1989, OIG received allegations of misconduct against the researcher. Our investigation involved conducting extensive interviews and collecting affidavits. We analyzed these materials in an investigative report and recommended debarment.

OIG determined that the researcher had been involved in 16 incidents of sexual misfeasance with female graduate and undergraduate students at the research site; on the way to the site; and in his home, car, and office. Many of these incidents were classifiable as sexual assaults. OIG further determined that these incidents were an integral part of this individual's performance as a researcher and research mentor and represented a serious deviation from accepted research practices. Therefore, they amounted to research misconduct under NSF regulations.

The offense was found to be aggravated by several considerations. The researcher had considerable control over the students at the site. He used alcohol to excess at the site and in connection with sexual misfeasance. He threatened to "blackball" graduate students in the professional community if they reported his behavior to authorities. He manipulated access to the data and the computer used to analyze the data in order to create opportunities for sexual misfeasance. The researcher violated the requirements of both the proposal under which his work was supported and the Research Experiences for Undergraduates program.

NSF's Office of the Director accepted OIG's recommendation of debarment, but extended the proposed term of debarment from 3 to 5 years. In accordance with regulations, the Office of the General Counsel, under authority from the NSF Director, served the subject with a notice of proposed debarment, and he was given a 30-day period in which to reply. In response, the researcher requested that the reply period be extended for 6 months. The Foundation's General Counsel extended his reply period for an additional 30 days. A final decision on the proposed debarment will be made after the researcher's reply is received.

# *Alleged Noncompliance with Recombinant DNA Guidelines*

NSF grantees are required to comply with the National Institutes of Health (NIH) Guidelines on Recombinant DNA as part of NSF's grant conditions and, by definition, noncompliance with these guidelines constitutes misconduct in science. In late March 1990, OIG received an allegation of noncompliance with NIH Guidelines on Recombinant DNA.

The suspected noncompliance was based on a publication in a leading science journal, which was co-authored by three investigators located at two different institutions. The acknowledgment line in the paper read "This research was supported by the National Science Foundation." implying that all work reported in the paper had Foundation support. According to the paper, by using recombinant-DNA techniques certain organisms were given new properties that could potentially cause undesirable effects if the organisms were accidentally released into the environment. These experiments, it was alleged, did not have Institutional Biosafety Committee (IBC) approvals as required by the NIH guidelines.

OIG first obtained the services of a consultant in recombinant DNA research and immediately ascertained that this situation did not pose any imminent dangers to human, plant, or other subjects. Subsequently, OIG arranged a meeting with staff of NIH's Office of Recombinant DNA Activities as well as with a representative of the Recombinant DNA Advisory Committee. Expert advice was that approvals were required for some of the experiments reported in the paper and that the IBC approvals available at that time from the involved institutions did not appear to cover these experiments.

After determining who performed specific parts of the scientific work described in the paper and where that work was conducted, OIG concluded that:

- There was no violation of NIH Guidelines on Recombinant DNA by the NSF-funded awardee because no experiments performed at his university required IBC approval.
- All experiments requiring IBC approvals were conducted by the lead author who did not have any NSF support and is not covered by NSF regulations.
- The acknowledgment in the paper should have indicated that NSF provided only *partial* support for the published work.
- Required IBC approvals for the regulated experiments at the lead author's institution appeared too broad and did not adequately relate to the experiments reported in the paper, although the IBC chairman at the lead author's institution claimed to the contrary and said that his IBC understood that the experiments reported in the paper were covered by its approval documents.

OIG reported its findings to the cognizant NSF program officials, the co-authors of the paper, and the chairman of the IBC at the lead author's institution. No actions were recommended against any researcher. However, we did, in an effort to improve the quality of IBC documentation, discuss the IBC approvals involved in this case with the Department of Agriculture, which is cognizant at the lead author's institution, and with the executive secretary of the government-wide Recombinant DNA Advisory Committee.

# Misconduct Regulations Should Apply To Grants in Support of Education As Well As Research

NSF regulations proscribe fabrication, falsification, plagiarism, or other serious deviation in proposing, carrying out, or reporting results from research. NSF was the first federal agency to prohibit this type of misconduct in research, which helps to ensure that federal funds are used only in support of appropriate scientific and engineering research.

A substantial portion of NSF grants, however, support mathematical, scientific, and engineering education rather than research. One of the Foundation's program directorates devotes almost all of its resources in support of education. All program directorates support science education at some level.

We believe that NSF should act to ensure the integrity of grants supporting education as well as research. Accordingly, we recommend that NSF's regulations on misconduct be promptly amended to proscribe misconduct connected with any type of NSF grant, whether related to research or education.

We have raised our concerns with the Director of the Foundation, and he has directed NSF's Office of General Counsel to initiate an amendment to NSF's misconduct regulation to ensure that it covers all grants. As of this writing, a draft of a proposed amendment to the misconduct regulations is pending within the Office of General Counsel.

Office of Inspector General

# SEMIANNUAL REPORT TO THE CONGRESS

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National Science Foundation

# Types of Allegations Received

OIG frequently receives requests for information about how it processes misconduct cases. We have recently attempted to classify our active and closed misconduct cases according to specific types of misconduct allegations. In some cases, allegations were minor or unclassifiable. The following discusses the kinds of allegations most frequently encountered, in descending order of occurrence.

## Plagiarism

We receive a large proportion of our cases from NSF program officers during their processing of grant proposals. For example, a reviewer may notice that a proposal does not acknowledge the source of passages taken from either a published book or paper or from a proposal to NSF or another federal or state agency. Program officers are required to forward such information to OIG for consideration as a case of possible misconduct.

Perhaps because so many cases come to OIG in this way, a large share of our allegations deal with plagiarism or with other misappropriation of intellectual property. Examples of such other violations would be failing to cite prior relevant publications and using the research ideas of others without receiving permission or giving credit. Forty of 75 cases received from January 1, 1989, to March 31, 1991, were concerned with plagiarism or misappropriation of intellectual property. To date, only minor cases of this type have been closed. OIG resolved most of them by corresponding with the subject and receiving an apology and perhaps the correction of a proposal. None of these cases produced a more formal finding of misconduct, though in some cases the subject's institution criticized the individual and imposed remedial measures.

## Fabrication and Falsification

Cases involving the fabrication or falsification of research data and specimens have received a great deal of attention in the media. Although allegations of this type occur under NSF awards, they are not especially common. Since the beginning of 1989, we have received seven fabrication and falsification cases, closed four cases, and found misconduct in one case. In that one case, NSF negotiated an agreement that the subject would not be a principal investigator on any proposal submitted to NSF within the next 5 years.

## Other Cases

The remaining cases have involved a wide variety of allegations. For example, several have involved false statements in proposals. One university official engaged in misconduct by compromising the review of a proposal under the Presidential Young Investigators program. Some cases have involved tampering with other researchers' experiments or exploiting subordinates in research contexts. One of these cases led to an agreement with the subject that he could neither serve as one of the senior personnel on any award from an executive branch agency nor review NSF grant proposals for 5 years. (See page 34.)

# Deferral Process

NSF policy is that research institutions should be responsible, to the greatest extent possible, for preventing and detecting misconduct and for dealing with any allegations of misconduct that arise. As a result, NSF regulations state that institutions are expected to initiate promptly

inquiries into any suspected or alleged misconduct and to conduct a subsequent investigation if warranted. In addition, our practice is to refer any substantive misconduct allegations to the institution whenever practicable. NSF's policy has several advantages: (1) it recognizes the role of the professional community in maintaining integrity in research, (2) individual institutions are encouraged to think about and develop their own standards and practices, and (3) allegations of misconduct can be resolved to the greatest extent practicable by peers at the local level.

OIG's policy of using deferral in the first instance recognizes both the institution's commitment to maintain integrity in research and the independence and autonomy society accords the research community. However, it also places a critical obligation on an institution that requests and accepts deferral. The institution is obliged to conduct an investigation that OIG can recognize as accurate and complete. OIG must also be able to conclude that fair and reasonable procedures in accord with due process were followed. After a careful review, we must be able to recommend adoption, in whole or in part, of the investigative report from the institution that accepted deferral or we must initiate our own investigation. We are fully prepared to conduct our own investigations when allegations are not adequately resolved by the deferral process.

**FISCAL YEAR 1989:** Since our inception, we have routinely deferred misconduct cases to the institution that employs the subject of the allegation. For example, three cases were closed in fiscal year 1989, and all of them involved investigations performed by the institution. One of these was a case of data misrepresentation, which led to an agreement between the subject and NSF that he would not be a principal investigator on any proposal submitted to NSF for 5 years. (See page 30.) The institution did not impose any sanctions because the subject resigned.

The second case also led to a finding of misconduct. The subject was accused of compromising the review of an application under the Presidential Young Investigators program. The institution placed a letter of reprimand in the subject's file.

The third case involved an individual making a false statement in a Presidential Young Investigators application. The institution did not find any misconduct, but it still withdrew the application.

**FISCAL YEAR 1990:** We closed one case that involved an investigation performed by the institution. The subject was accused of plagiarism. There was no finding of misconduct, but the institution imposed remedial actions. A similar case closed in fiscal year 1990 involved an inquiry by the institution, but not an investigation. It also involved plagiarism. Again, no misconduct was found, but the subject was judged not to understand common academic practice in the use of direct quotations. Because the subject had left the institution, no further action was taken.

**FISCAL YEAR 1991:** During the first half of fiscal year 1991, four cases were closed that involved an inquiry or an investigation by an institution. Two cases involved inquiries, and the other two involved investigations. These cases are described on the following pages.

## Defective Inquiry

In one of these cases, we reviewed an inquiry that an institution had performed on its own initiative. A faculty member was accused of plagiarism, and the inquiry found that some degree of plagiarism had been committed and that the ethical violation was not trivial. Despite the inquiry committee's findings and the mandate it had been given, it failed to recommend an investigation. The subject received only a minor remedial penalty. We did not reopen this case because it was an old issue and its connection with NSF funding was remote. We did, however, send the institution an analysis and criticism of its inquiry and its resolution of the case.

## Inquiry Into Allegations of Plagiarism

The second inquiry involved a case that was handled jointly by our office and the Public Health Service's Office of Scientific Integrity. The subject was accused of plagiarism in writing grant proposals that copied from the complainant's proposals without the complainant's consent. The institution's inquiry committee found that, because of the close collaboration of the complainant and the subject in the past, the proposals involved shared intellectual property. Hence, the inquiry committee did not find misconduct, but it did find that the subject had breached normal research decorum in submitting proposals without the complainant's consent. The subject received a critical letter from the university administration and was admonished to exercise extreme care in future scientific relationships and to seek consultation where necessary with senior academicians. We found that the university's action was a satisfactory resolution of the case, and we accepted the inquiry report.

## Southwest University Resolves Dispute Over Intellectual Property

We received notification that an institution was expanding its inquiry into an investigation in an effort to fully address allegations of academic dishonesty. An NSF-supported faculty member (in the biology department) made allegations against a senior research scientist who had been employed by the faculty member's research group. The alleged dishonesty involved (1) submitting an article without the professor's knowledge or permission; (2) making false claims in the article regarding the research scientist's contributions to the development of the techniques reported; and (3) compromising the work done by others as well as the competitive position of the professor's research program by publishing the techniques and results.

Our review of the final investigative report found that the university investigative committee had proceeded conscientiously with its task. The committee did not find any evidence of academic dishonesty by the senior research scientist and therefore recommended no punitive action. The committee, however, did find probable errors in judgment, communication, mutual trust, and professional courtesy by both parties. It noted that these individuals are talented scientists that have made and could continue to make major contributions.

Further, the investigative committee suggested that each party send letters to appropriate journal editors explicitly acknowledging certain contributions, short of co-authorship, by the other in two previously published papers.

We accepted the findings of the university's investigative report and closed this case.

## Major Private Eastern Research Institution Investigates Alleged Fabrication of Data

In February 1990, a university informed us that its inquiry supported a formal investigation into allegations of intentional data modification by a postdoctoral associate supported on an NSF award for materials research. Specifically, it was alleged that the postdoctoral associate improperly and intentionally adjusted his research apparatus to yield false results of higher value than any previously recorded by anyone in his field of research.

In July 1990, we received a copy of the 2-page final investigative report by the Dean of the University Faculty. On the basis of the faculty investigative committee's report, the Dean of Faculty concluded that the evidence did not support a finding of academic misconduct. We did not believe the 2-page report contained sufficient information to enable us to assess the accuracy or completeness of the investigation or whether the investigating entity followed reasonable procedures. We obtained copies of the inquiry report, the full report of the faculty investigative committee, and other reports prepared during the investigation.

Our review of these reports indicated it was necessary for us to evaluate further: (1) whether the admissions initially obtained from the subject were obtained in a coercive manner as alleged by the subject; (2) whether the University was correct in reversing its faculty investigative committee's finding of misconduct; (3) why the investigative committee did not explain the circumstantial evidence that it found to be convincing; and (4) why the Dean of University Faculty's report addresses only two of the three incidents of alleged data tampering.

During the review reported above, we learned that the subject of the allegation had left the university and returned to his country of origin. Under these circumstances and considering our limited resources, we have closed this case with a letter to the institution raising questions and expressing serious concerns about its investigation.

## Tentative Conclusions

From these closed cases, as well as active cases that involve an inquiry or an investigation performed by a research institution, we have reached a number of tentative conclusions.

- Definitions of research misconduct in institutional regulations are not always the same as the Public Health Service's or NSF's definitions. The differences could lead to problems with some cases referred to these institutions.
- Reports of inquiries or investigations performed by institutions are sometimes too brief, poorly reasoned, or otherwise uninformative. This situation may exist

because personnel serving on inquiry and investigative committees are inexperienced in this kind of activity.

- Institutions properly rely on scientific expertise when conducting inquiries and investigations. However, legal requirements affect every stage of the institutional proceeding, and we believe that institutional inquiries and investigations should always have the assistance of legal counsel.

- Committees of inquiry or investigation sometimes run into unnecessary difficulties trying to assess whether the subject intended to do something wrong. In deciding what sanction if any to impose it often is necessary to determine whether the subject acted intentionally. These are situations where legal advice is especially important.

- We note from our limited experience with deferrals that some institutions performing preliminary inquiries may be tempted to find the subject guilty of "carelessness" rather than misconduct. This is a compromise that avoids the unpleasantness and publicity that might result from a full investigation and a possible formal finding of misconduct. Sometimes a token penalty of a remedial character is imposed in place of a formal sanction.

## *Settlement Reached in Misconduct Case*

**RESEARCHER:** In fiscal year 1990, we recommended the debarment of a researcher from receiving grant funds from the federal government for a 3-year period. (OIG Semiannual Report to the Congress, Number 3, pages 26 and 27.) The subject was a biological scientist who directed the research of graduate and undergraduate students at a field site in a foreign country with funding from NSF's Research Experiences for Undergraduates program. Our investigative report explains that he was accused of sexual malfeasance that was an integral part of his performance as a researcher and research mentor. NSF's Office of the Director accepted our recommendation of debarment, but extended the proposed term of debarment from 3 to 5 years.

Exercising his rights under federal debarment and suspension regulations, the subject waived his right to an administrative hearing. In place of debarment, he elected to exclude himself voluntarily from submitting research proposals to the government. Specifically, he will not be a principal investigator or co-principal investigator and will not be among the senior, key, or supervisory personnel on a grant, contract, or cooperative agreement for science and engineering research or education with any agency of the Executive Branch for 5 years after the date of the notice of proposed debarment. During this time period, he will not serve as a reviewer on any NSF grant proposal. OIG and NSF's Office of the Director have accepted this settlement and have agreed to take no further action against the subject in this matter.

**INSTITUTION:** The grant under which the field research was done was awarded to a nonprofit research corporation. We determined that this institution had some prior experience with the subject that made it inappropriate to place him in a position of exclusive authority at the research site. We raised our concerns with the institution and negotiated a settlement that has been accepted by NSF's Office of the Director. The institution will not submit grant proposals to NSF for 2-1/2 years and will return

$7,390 to the government. In addition, at the institution's expense it will conduct a seminar for its employees and others on appropriate faculty behavior in a field program.

## *A Scholarly Dispute But Not Misconduct*

Recipients of an NSF grant to study consumer bankruptcy published the results of their NSF-sponsored research in a book. Another scholar in the same field of research wrote to OIG challenging the originality and the validity of the conclusions reported in the book. In particular, he alleged that the authors committed misconduct by (1) improperly claiming originality while failing to adequately acknowledge work previously published by others and (2) failing to properly address other previously published results that contradict the authors' conclusions. After careful review of the allegations, which OIG insisted the complainant refine and state precisely, we concluded that the allegations were scholarly disagreements about the evaluation and meaning of current and past work. Disputes of this type are well suited to the free and open airing of opposing views within the scientific community at interest. This "critical" process normally occurs in scholarly presentations and in journal articles. In this case, at least two extensive and highly critical reviews of the book have been published in law reviews. OIG concluded that this case involved a substantive dispute that the professional community was able to handle and was handling. As such, it was judged to fall outside the range of research misconduct and was closed without further action. SA 4

# Revisions To Misconduct Regulations

In this reporting period, the Foundation, acting on our recommendation, proposed an amendment to its regulation on misconduct in science and engineering. The amendment was coordinated with the President's Office of Science and Technology Policy (OSTP) and the Public Health Service (PHS). The regulatory amendment, published at 56 Fed. Reg. 5789 (February 13, 1991), proposes the following:

- makes clear that misconduct is proscribed under any NSF activity, whether related to research or education;
- expressly defines misconduct to include retaliation against good faith whistleblowers;
- makes clear that a formal investigation must be initiated whenever an allegation of misconduct is determined to have substance;
- makes explicit that OIG is responsible for misconduct inquiries and investigations, and that OIG attorneys, rather than NSF's Office of General Counsel, are responsible for all related legal issues; and
- clarifies how NSF's debarment and suspension procedures are followed in a misconduct case.

The period for public comment ended on March 15, 1991. The Foundation is now reviewing the letters that it received from four universities and three associations. After reviewing this material and coordinating with OSTP and PHS, NSF will publish its final regulatory amendments.

Office of Inspector General

# SEMIANNUAL REPORT TO THE CONGRESS

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National Science Foundation

# OVERSIGHT ACTIVITIES

# Introduction

The Office of Oversight focuses on the science-engineering-education-related aspects of NSF operations and programs. The office conducts and supervises compliance, operations, and performance audits as well as investigations of NSF's programs and operations. It handles all allegations of nonfinancial misconduct in science, engineering, and education and is beginning studies on the general problem of misconduct. It oversees the operations and technical management of approximately 200 NSF programs, undertakes inspections, and performs special audits and studies.

During this reporting period, the Oversight Office continued its outreach activities by speaking at meetings convened by professional organizations, such as the American Association for the Advancement of Science, the Association of College and University Offices, and the American Political Science Association.

# Misconduct in Science and Engineering

## Revised NSF Regulations on Misconduct

During the reporting period, NSF regulations on misconduct in science and engineering were revised. Misconduct is now defined as (1) fabrication, falsification, plagiarism, or other serious deviation from accepted practices in proposing, carrying out, or reporting results from activities funded by NSF; or (2) retaliation of any kind against a person who reported or provided information about suspected or alleged misconduct and who has not acted in bad faith.

In our last semiannual report, we noted NSF's proposed amendments to its regulations on misconduct in science and engineering. The revision was issued by the NSF Director and coordinated with the President's Office of Science and Technology Policy and the Public

Health Service. On May 14, 1991, the amended regulations (45 CFR 689) were published as final and made available to the public in 56 Fed. Reg. 22285. The revisions to NSF's misconduct regulations (1) proscribe misconduct in any science, engineering, and education activity funded by NSF; (2) protect any good faith whistleblower reporting possible misconduct related to an NSF proposal or award; (3) clarify the definition of an *inquiry* to make clear that a formal investigation must be initiated whenever an inquiry determines that the allegation of misconduct has substance; and (4) make clear the procedures for suspension and debarment of an individual or institution from participation in government programs for a specified period.

# OIG's "Dear Colleague" Letter Revised

After publication of NSF's final rule on misconduct, we revised our "Dear Colleague" Letter to incorporate the May 1991 changes in NSF's misconduct regulations and to clarify certain sections. The revised letter was published in August 1991. It explains to the research community what happens under NSF regulations when someone makes an allegation of misconduct involving any NSF activities. (Copies of the revised "Dear Colleague" Letter, OIG 91-1, are available upon request.)

# Analysis of Models for the Processing of Misconduct Cases

In recent publications, we have noted two competing models for the way federal offices like ours might handle misconduct cases: a *legal adversary* model and a *scientific dialogue* model. We appreciate this contribution to a difficult and important subject, but we would like suggest some clarifications and corrections.

As usually presented, the legal adversary model is applied to the whole misconduct case, without distinguishing the investigation stage from the adjudication stage. The processing of a misconduct case would be a court-like process dominated by lawyers. The scientists involved would probably see their role minimized to that of expert witnesses. Issues would be resolved on the basis of the law, rather than on the basis of scientific evidence. This model emphasizes the due process protection of those involved, including the right of the accused to examine witnesses and documents throughout the proceeding. However, because of its confrontational way of proceeding it does not provide anonymity for whistleblowers or confidentiality for the accused party. This model seems artificial to us as a description of how someone would do an inquiry or investigation; in any case, we do not follow it in this office.

The scientific dialogue model, by contrast, would put misconduct cases in the hands of scientists and would use modes of discussion with which scientists are familiar. The standard illustration of this is a journal editor demanding that the author of a scientific paper present data to back up a disputed claim before the paper can be published. A professional challenge is being made rather than a legal accusation. In general, in the scientific dialogue model the emphasis is on scientific evidence, rather than the law. Due process rights are guaranteed just as in the other model, except that there is no direct confrontation or cross-examination of witnesses by the accused, in order to protect anonymity and confidentiality for both parties.

We believe that it would be a great oversimplification to apply either of these models to a misconduct inquiry or investigation. An inquiry or investigation by a federal enforcement office is not a scientific dialogue because a federal agency is trying to determine

whether wrongdoing occurred. This may lead to the imposition of a serious penalty. In these circumstances, the rights of the parties involved and the legal obligations of the agency are prominent, and the law must constantly be considered. Therefore, it is not possible to exclude lawyers from the process. Moreover, investigative techniques are used, such as taking sworn testimony and securing a subject's laboratory notebooks, that do not occur in scientific dialogues with journal editors.

However, a misconduct inquiry or investigation is also not a courtroom proceeding. The models discussed above fail to make the needed distinction between investigation and adjudication. An investigation by our office is a fact-finding and analytic effort that results in an investigative report. If we wish to recommend a finding of misconduct, we sent the report to the Office of the Director. The Director's Office makes the adjudication as to whether misconduct occurred and whether NSF will impose a sanction. This adjudication involves an adverserial proceeding, and some sort of legal adversary model would be applicable to this stage of the case. However, since our office does not conduct the adjudication, we also do not conduct any adversarial proceedings. We act as investigators, and when we interview witnesses we deal with them one at a time. We do not hold trials, just as we do not conduct scientific dialogues.

Since an investigation has to be conducted by persons who know how science works, in our office scientists, rather than lawyers, are in charge of misconduct cases. An attorney is assigned to each case in a supporting role, and professional investigators are assigned as needed. Thus, we use a multidisciplinary investigative model based on the contributions of different kinds of professionals. In general, we believe that scientific standards and legal requirements must be met at the same time, and that no choice is possible between them. We provide the procedural rights that are appropriate in an investigation. We go to great lengths to preserve the anonymity of whistleblowers and the confidentiality of the subjects of our investigations. In addition, during the adjudication stage in the Director's Office, NSF provides full due process rights, including the right to examine witnesses and review all documentary evidence. We believe that our approach combines the positive aspects of the legal adversary and scientific dialogue models and goes beyond them.

# Significant Cases of Plagiarism

## Large Midwestern University Finds Extensive Plagiarism

While reviewing proposals for research in electrical engineering, a panelist reported that a proposal from a principal investigator at a midwestern university extensively plagiarized the work of another researcher in the same field.

Following our usual practice, we wrote to the subject asking for his views, comments, or an explanation of the alleged plagiarism. The subject responded that (1) he was "under a lot of pressure to write grant proposals"; (2) he had only a very short time to prepare his proposal

due to teaching and departmental responsibilities as well as preparing a tenure dossier; (3) he had no idea of the "mistake" he had made in referencing due to haste and failure to proofread his proposal; (4) he regretted being so careless in the preparation of his proposal; and (5) he told us "You can rest assured that this has not happened before and that it will never happen again."

Based on our earlier comparison of texts, we were not persuaded by the subject's explanation and asked the subject's university to accept deferral of this case. In February 1991, the university accepted responsibility for conducting the necessary inquiry and investigation into this matter and forwarded a copy of its policies and procedures for handling allegations of misconduct in research. The university assigned the case to its Committee on Research Misconduct, which kept us informed as it proceeded. The following June the Vice President for Academic Affairs and Research transmitted the university's final investigative report. After a thorough review, we accepted the report of the investigation as fair, accurate, and complete.

The university's investigative committee concluded that:

(1) The subject not only plagiarized from the source identified in NSF's allegation, but also plagiarized a second publication. In the investigative committee's judgment the subject "did not take the normal steps or procedures to avoid plagiarism." The committee found that the subject "had reason to believe that his audience would take another's work to be his own and failed to take precautions (by proofreading, proper use of quotations, etc.) to correct any misimpression that might occur."

(2) Plagiarized material from the two sources appears not only in the subject's proposal to NSF, but also in an earlier proposal to the Defense Advanced Research Projects Agency (DARPA) and in a brief Institute of Electrical and Electronics Engineers (IEEE) conference paper; and therefore, the plagiarism of the two sources was a repeated rather than a single, isolated event.

(3) The subject did propose a different method of solution than that used in the publication that he most extensively plagiarized in his proposal to NSF. His proposed solution was based on a method discussed in the second plagiarized source. The principal investigator's unique contribution was linking one source's introduction and definition of the problem to another source's presentation of the method of solution.

(4) The subject's NSF proposal, by extensive copying and paraphrasing, misrepresented as his own the introductory material and the definition of the problem. He did not reference or give proper credit to the researcher whose work was principally plagiarized. The subject also misrepresented as his own both words and some ideas about the method of solution from a publication co-authored by two other engineers.

The investigative committee also addressed the subject's voluntary response to the allegations OIG sent him and found that the subject's various claims of pressure and of time constraints were not truthful. The committee found that the subject sent his proposal to NSF 2 weeks after sending it to DARPA and concluded that he had sufficient opportunity both to proofread his NSF proposal and to eliminate copied material. The investigative committee also rejected the subject's explanation that he intended to reference one of his plagiarized sources, but due to a typing error

he included the wrong reference in his NSF proposal. The committee found that the only sentence in the subject's NSF proposal referring to the plagiarized researcher was taken directly from that researcher's publication. As such, the reference was made by the original researcher who was citing some of his earlier work.

In addition, the investigative committee concluded the subject's statement that this was an isolated incident, which had not occurred before, and would not happen again was false. The subject had submitted the proposal to DARPA 2 weeks before he sent his proposal to NSF, and sometime later, he submitted his conference paper containing the same plagiarized material.

Based on these findings, the university imposed its own sanctions. It sent a letter of reprimand to the subject and made the letter a permanent part of the subject's personnel file at the university. Further, the chairman of the Department of Electrical Engineering was directed to withhold three annual merit salary increases to the subject. Also, for 2 years the subject must submit to the chairman of his department copies of any proposals he intends to send off-campus. The complete proposal must be accompanied by a transmittal letter, which states that the subject has recently reviewed university policies and procedures for research misconduct and that his proposal is free of misconduct as described in those policies and procedures. Copies of the transmittal letter and the proposal must also be sent to the Deans of the college of engineering and the graduate school. Last, the subject was directed to delete the paper he published in the IEEE proceedings from his university curriculum vitae.

We noted the extensive plagiarism found, the pattern of activity exhibited in the three uses of plagiarized material, and that two government agencies (DARPA and NSF) received proposals containing plagiarized material. Therefore, in forwarding both the university investigative report and the subject's rebuttal for adjudication, we have recently recommended to NSF's Deputy Director that the subject be debarred for a 3-year period.

## Plagiarism Found in Proposal Submitted From Small Southern University

We determined that the head of an agricultural research laboratory in a small southern university committed plagiarism in a proposal submitted to NSF. The section on research methods in the proposal was essentially copied verbatim, without acknowledgment, from a paper published by other authors.

In accordance with NSF misconduct regulations, we conducted our own inquiry and then asked the institution to conduct an investigation. Allegations of plagiarism are very common among the misconduct cases we receive, and this case, as it developed, showed many characteristics that we have seen in other cases. For example, the subject made a defense similar to others we have seen based on carelessness and unintentional oversight. According to the subject, he had a great deal of work, and the plagiarized material was inserted into the

proposal by a typist whose work was not carefully supervised or checked.

The subject's "carelessness defense" was part of an attempt to show that he did not intend to deceive NSF, and that since no one could prove he had such an intent there could not be any finding that he had plagiarized. The university investigating committee accepted this argument. We have found that questions about the subject's intent frequently arise in inquiries and investigations performed at institutions, and often introduce confusion. Many university panels do not show any clear idea of what would be needed to prove intent. 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.

Our position on this matter is that the evidence for the subject's overt behavior is ordinarily enough to answer any questions about his or her intent. For example, when researchers sign proposals and send them to NSF they take responsibility for any plagiarism that is found in those proposals. Further inquiries into the state of mind of those researchers are beside the point in situations where express certifications are provided.

In this case, the subject also claimed that there could not have been plagiarism because research proposals contain no claim to originality. There was no statement, explicit or implicit, in the proposal saying that the research steps were the original work of the principal investigator. Our office, as well as NSF policy, rejects this position. Proposals do claim originality, unless otherwise stated, and it is important for those submitting proposals to indicate the sources of any text or research methods that have been borrowed from other authors.

We have also observed that university inquiry and investigation panels tend to compromise by finding that the subject committed some offense less serious than the original allegation. Then a token penalty is imposed by the institution in place of the full sanction that would be appropriate for the offense originally alleged.

All these things happened in this case. The institution found that the subject was guilty of blatant carelessness that constitutes a serious deviation from accepted practices within the scientific community. This was considered to be a significantly lesser degree of misconduct than plagiarism. By way of sanctions, the institution decided to withdraw the proposal, which had already been declined by NSF, and to send the subject a letter of reprimand.

In accordance with NSF's misconduct regulations, we have decided to accept the institution's findings only in part. We accepted the finding that the subject was guilty of misconduct for seriously deviating from accepted practices within the scientific community. However, we also found that this deviation amounted to plagiarism. We have prepared an investigative report supplementing and correcting the report we received from the institution. Our report has recently been forwarded to the Deputy Director of NSF with a recommendation that the subject be debarred from receiving all federal funds for a 2-year period.

Office of Inspector General

# SEMIANNUAL REPORT TO THE CONGRESS

number 6 • october 1, 1991 - march 31, 1992

National Science Foundation

# OVERSIGHT ACTIVITIES

The Office of Oversight focuses on the science-engineering-education-related aspects of NSF operations and programs. The Office conducts and supervises compliance, operations, and performance audits as well as investigations of NSF's programs and operations. It handles all allegations of nonfinancial misconduct in science, engineering, and education and is beginning studies on the problem of misconduct. The Office oversees the operations and technical management of approximately 200 NSF programs, undertakes inspections, and performs special audits and studies.

TABLE 4

| | FY 1991 Last Half | FY 1992 First Half |
|---|---|---|
| Active Cases From Prior Period | 40 | 49 |
| Received During Period | 20 | 23 |
| Closed Out During Period | 11 | 12 |
| In-Process at End of Period | 49 | 60 |

## MISCONDUCT IN SCIENCE AND ENGINEERING

From January 1, 1989, to the close of this reporting period, OIG received 120 allegations of misconduct. Of these, we have closed 60 cases. NSF has imposed sanctions in two of these cases and in one case that was received before 1989. All three resulted in debarments or equivalent settlements.

Table 4 shows the status of our caseload. To process this caseload, we have the equivalent of 2.5 full-time scientists and the part-time assistance of two lawyers and two investigators.

### *Other Serious Deviation From Accepted Practices*

Offices in federal agencies that investigate misconduct allegations work from a definition of what constitutes misconduct. At NSF, misconduct is defined as (1) fabrication, falsification, plagiarism, or other serious deviation from accepted practices in proposing, carrying out, or reporting results from activities funded by NSF, or (2) retaliation of any kind against a person who reported or provided information about suspected or alleged misconduct and who has not acted in bad faith.

Definitions of misconduct are currently under serious discussion. One suggestion has been that the phrase *other serious deviation from accepted practices* needs to be removed or replaced. In our view, the arguments in support of this suggestion are misguided. We believe that the phrase serves an important purpose, and that

a phrase like this should be part of any working definition of misconduct.

The most common criticism of the "other serious deviations" phrase is that it is excessively vague. Scientists allegedly cannot tell what activities NSF will regard as seriously deviating from accepted practices. Therefore, goes this argument, these scientists may be subjected to misconduct investigations and sanctions for activities that they were not told NSF would treat as misconduct. A second criticism is that innovative research always deviates from what is commonly accepted in the scientific community. A literal reading of the definition would appear to label such innovative research as misconduct. A third concern is that the definition will be interpreted in such a way that scientific disagreements or unintentional errors in science will be punished by a government agency as misconduct.

We believe that the definition itself contains the answers to these difficulties. It appeals to "accepted practices," with the clear implication that within the scientific community , there are standards for acceptable and unacceptable practices. The definition is based on the assumption that when asked, the community can express its standards and can apply them to individual cases where misconduct is alleged. However, to our knowledge, no one has ever compiled a complete list of the unacceptable practices that scientists generally recognize. In particular, no one has demonstrated that a short list like "falsification, fabrication, [and] plagiarism" exhaustively expresses those standards.

For these reasons, it is appropriate to have an open-ended phrase like "other serious deviations" in the definition that allows for unanticipated types of misconduct. The experience of federal enforcement offices has shown that such cases do arise and cannot be dealt with under the rubric of falsification, fabrication, and plagiarism. The misconduct regulations enacted at individual colleges and universities commonly include various other activities in their definition of misconduct. An open-ended definition also makes it possible to allow for differences in the practices of different scientific disciplines and different research institutions when dealing with a given misconduct allegation.

Such a definition clearly requires that there be a way of ascertaining the accepted practices of the relevant community of scientists in connection with a specific misconduct case. Actually, in our cases, we have not had disputes with the accused parties over what is covered by the "other serious deviations" phrase.

If such a dispute were to arise, the case would ordinarily be sent to the subject's institution for investigation. An investigating panel of scientists at the institution would have the first opportunity to consider whether what occurred was a serious deviation from accepted practices in science. A second level of consideration would be given by our scientific staff when it reviewed the university's report.

However, only NSF's Deputy Director can decide that there was misconduct and impose a sanction, and this must be done through an adjudicatory process. (See *Semiannual Report to the Congress*, No. 5, pp. 29 & 30.) No misconduct case at NSF has yet gone through the full hearing process. If there were a dispute over the application of the "other serious deviations" clause in such a case, the Director's Office would use the judgment of experts in the relevant fields of science in reaching its decision.

Therefore, the answer to the first criticism is that NSF is not enforcing standards that are unknown to the working scientist. Rather, NSF will take action only against activities that scientists themselves would generally recognize as culpable.

The second criticism was based on the premise that innovative research as such

deviates from accepted practices. From the above discussion, it is clear that this is not true. The scientific community recognizes innovative research as acceptable and even praiseworthy. While such research involves some kind of break with the past, this does not amount to a deviation from what scientists regard as acceptable practice.

The third criticism concerned the punishment of scientific disagreements or unintentional errors. NSF addressed this issue explicitly last year when it amended its misconduct regulations in the Federal Register:

*Ordinary errors, ordinary differences in interpretations or judgments of data, scholarly or political disagreements, personal or professional opinions, or private moral or ethical behavior or views are not, and could never be considered to be, misconduct under this definition.* (56 Fed. Reg. 22287 col. 2 [May 14, 1991].)

As a matter of law, therefore, NSF's definition of misconduct in science could not be interpreted to include technical disagreements or unintentional errors. Further, as noted above, NSF's definition of misconduct is based on the practices accepted or rejected by the scientific community. Scientists recognize that the possibility of errors and disagreements is intrinsic to the practice of scientific research, so that simply making an error or being involved in a disagreement is not misconduct. In fact, an error or disagreement in research is not a sufficient basis for initiating a misconduct case.

## SIGNIFICANT MISCONDUCT CASES

### *Plagiarism In a Southern State University*

We received an investigation report and supporting documents from a large southern state university for a case involving substantial plagiarism by an NSF principal investigator (PI) and his former NSF-supported graduate student. The PI left the university before the allegation of plagiarism was made, and the graduate student was denied his doctorate as a result of the university's preliminary inquiry into the allegation. Because neither subject of the investigation remained at the university when the university completed its investigation, it concluded that plagiarism had occurred but did not address the subjects' culpability. The documentation supplied by the university, as well as additional material supplied by the PI, enabled us to draw our own conclusions about culpability.

Two researchers at the same university had written an article developing a set of equations for a method to approximate a solution for an engineering problem. The graduate student had obtained a pre-print of the article from one of the authors, from whom he also sought and obtained extensive explanation of the article's substance. The graduate student then rewrote the equations, changed some of the terms and used some different sign conventions, but did not change (in the judgment of the university's investigation committee and an NSF expert) the substance of the method reflected in the equations. The graduate student presented this work to the PI, who discussed it and worked with him to ensure its correctness. The graduate student did not disclose to the PI that he had originally obtained the method in a preprint of an article by the other researchers. An article setting forth this method, with some examples illustrating its utility, was submitted for publication by the PI and the graduate student, and it was published in a journal; the method also constituted a substantial portion of the graduate student's Ph.D. dissertation.

We concluded that the graduate student was solely responsible for the plagiarism of the material in the article and his dissertation, which is misconduct under NSF's regulation. We also concluded that

the PI was unaware of his graduate student's actions and had not committed misconduct. Because the graduate student has not received federal funding for more than 3 years, and has left and is not expected to return to the United States, we closed the case without recommending that NSF's Deputy Director impose a sanction.

## *Poor Laboratory Work, But Not Misconduct*

We received an allegation of possible data falsification based on inconsistent reporting of experimental results. A proposal submitted to NSF described quantitative properties of certain prepared compounds that differed from the properties that the same PI had published a year before for the same compounds. We deferred the case to the PI's institution, a large state university in the midwest. To ensure the integrity of the PI's laboratory records, we counseled the university to obtain the records from the PI immediately and keep them secure, but accessible, until the matter was closed, and it did so. The university concluded that the PI had simply repeated his work, found the earlier results to have been in error, and reported only the corrected results in his proposal; there had been no falsification or fabrication.

After consulting experts, we were troubled by the poor research practices reflected in the laboratory records that accompanied the university's report. Chemical yields and purity levels had been reported by the PI in both the original article and the "corrected" proposal with great precision, but in fact, those figures had been arrived at by unjustified approximations based on data from impure material, the calculations of which were not recorded in any laboratory notebooks. This called into question the propriety of the PI reporting such results to a journal or submitting them to NSF in support of a grant proposal. We therefore asked the university to consider whether, in its view, the practices reflected in the laboratory records constituted "other serious deviation from accepted practices" in that particular research field, and thus misconduct under NSF's regulation.

The university reevaluated the laboratory records and data, and it concluded that there were *some less than ideal procedures in [the PI's] laboratory environment and in his style of leadership that do require corrective action*, which the university will oversee. Ultimately, the university concluded *that there exist some irregularities associated with the experimental results being questioned, but these do not constitute misconduct as defined by the National Science Foundation*. Accompanying the university's supplemental report was a letter from the PI in which he acknowledged failure to maintain adequate standards of scientific work and reporting in his laboratory. He stated that he was instituting corrective procedures in his laboratory, and stated emphatically "that mistakes such as these will not occur again."

Although we were concerned about some of the research practices documented in this matter, we accepted the university's judgment that those practices did not constitute misconduct in science. We are also reassured by the subject's response and the preventive actions taken by the subject and the university. In light of the university's responses in this matter, we concluded that there was not sufficient evidence to establish that the subject engaged in misconduct in science under NSF's regulation, and we closed the case.

## FOLLOWUP ON PREVIOUS SIGNIFICANT CASES

### *Large Midwestern University Finds Extensive Plagiarism*

In our last semiannual report (No. 5, pp. 30-32), we described an investigation into allegations of serious plagiarism at a midwestern university. We noted the extensive plagiarism found and the pattern of activity exhibited in three uses of the plagiarized material, including its use in proposals submitted to two government agencies (the Defense Advanced Research Projects Agency and NSF) as well as an Institute of Electrical and Electronics Engineers publication. We reported that we had accepted the university's investigative report and had forwarded it with the subject's rebuttal statement to NSF's Deputy Director. We recommended that the subject be debarred for 3 years.

Since our last report, the Deputy Director has fully adjudicated this matter. He accepted our recommendation and sent the subject a detailed proposed notice of debarment informing him that he had 30 days in which to respond. The subject did not respond, and the proposed debarment went into effect on December 19, 1991.

The Deputy Director informed the subject by letter that his debarment had become final. Subsequently, NSF's Office of General Counsel notified the General Services Administration that the subject had been debarred from directly or indirectly obtaining federal research grants until December 19, 1994. This case is now closed.

### *Plagiarism in Proposal From Small Southern University*

In Semiannual Report No. 5 (pp. 32 & 33), we discussed another case of alleged plagiarism in an NSF proposal. This case was sent to the principal investigator's institution for preliminary inquiry and investigation. The institution found that the subject was guilty of blatant carelessness that constitutes a serious deviation from accepted practices within the scientific community and therefore had committed misconduct under NSF regulations. However, it considered this a significantly lesser degree of misconduct than plagiarism. We accepted the finding of serious deviation from accepted practices, but we found that the subject's actions did constitute plagiarism. Accordingly, we recommended to NSF's Deputy Director that the subject be debarred from receiving all federal grant funds for 2 years.

Since our last report, the Deputy Director accepted our recommendation and sent the subject a Notice of Proposed Debarment. The subject responded to the Notice by submitting information and arguments in opposition to the debarment. NSF has therefore offered the subject a formal public hearing, which has not yet been scheduled.

## *Recovery Of Funds From An Eastern University*

NSF awarded a grant to an eastern university specifically to acquire a multi-user research instrument for departmental faculty members, graduate students, and postdoctoral associates. NSF's program announcement specifies that only shared-use instruments should be requested. It came to our attention that one of the four designated faculty users of the research instrument left the university and arranged to take the instrument with him to his new institution.

Our review disclosed that (1) the faculty member had resigned his position 1 month before NSF awarded its grant but did not inform NSF; (2) the grantee university had purchased the multi-user instrument almost 4 months before the effective date of NSF's award, which exceeds the allowed 90-day advance purchase period; (3) the grantee university transferred the same instrument to its former faculty member's new university 1 month after purchase, which violates the shared-use condition; and (4) the grantee university was seeking approval from NSF to transfer its departmental instrument 4 months after the actual transfer had occurred rather than before transfer.

OIG met with the cognizant program officer and the grants officer to ascertain whether NSF had completed its actions on this matter. In view of the recently received request to transfer the multi-user research instrument, all agreed that NSF had not yet completed its action.

Subsequently, the grantee university told NSF that it had received $90,000 for the instrument from the former faculty member's new university. The grantee university said that its former faculty member's new research program needed this instrument. The grantee university could do without the instrument by employing other techniques available in the department or using instruments outside the department, as necessary, to conduct the proposed research and educational tasks. This would be accomplished by using the funds paid by the new university for the transferred instrument.

Since the conditions of NSF's multi-user research instrumentation program were not met, DGC has initiated action to recover the full $88,633 NSF granted to purchase the multi-user instrument.

## *Funds Recovered As A Result of Misconduct Inquiry*

We received an allegation from a PI at a midwestern university that a faculty colleague had plagiarized his proposals. The complainant later alleged that he was losing his university post in retaliation for bringing this allegation.

During our inquiry into these misconduct allegations, we found that the university had given the PI a written notice of non-reappointment 1 year before the alleged plagiarism occurred. Therefore, this was not retaliation against a good faith whistleblower who reported plagiarism.

In connection with the complainant's nonreappointment, the cognizant NSF program officer in the Directorate for Computer and Information Science and Engineering received a letter from the university nominating substitute PIs to replace the complainant on the NSF-funded project. The NSF program officer denied the university's request because the background and expertise of the substitute PI and co-PI were not appropriate for the project.

During our review, we examined the complainant's grant jacket, and found a letter from the awardee university stating its intention to return the unspent grant funds to NSF. We found that the program officer failed to initiate termination-of-award procedures, and NSF had not yet recovered the unspent funds. We advised the program officer to terminate the award so that DGC could properly close out the grant and recover the unspent funds. Subsequently, DGC informed us that the grant was terminated with recovery of $50,738.

Office of Inspector General

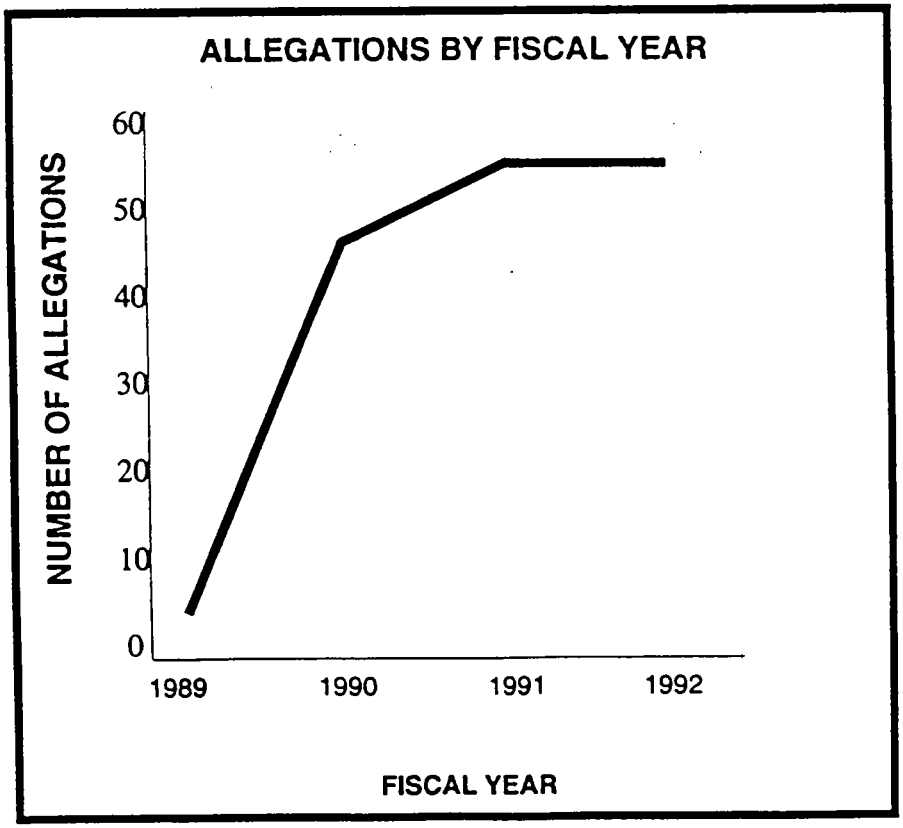
# SEMIANNUAL REPORT TO THE CONGRESS

number 7 • april 1, 1992 - september 30, 1992

National Science Foundation

## OVERSIGHT ACTIVITIES

The Office of Oversight focuses on the science-engineering-education-related aspects of NSF operations and programs. The Office conducts and supervises compliance, operations, and performance audits as well as investigations of NSF's programs and operations. The Office handles all allegations of nonfinancial misconduct in science, engineering, and education and is continuing studies on specific issues related to misconduct. The Office oversees the operations and technical management of approximately 200 NSF programs, undertakes inspections, and performs special studies.




# PROPOSED NEW DEFINITIONS OF MISCONDUCT IN SCIENCE

During this reporting period, two new definitions of misconduct in science have emerged. One of these new definitions was devised by the National Academy of Sciences' (NAS) Committee on Science, Engineering, and Public Policy (COSEPUP) Panel on Scientific Responsibility and the Conduct of Research and the other by the Public Health Service's (PHS) Advisory Committee on Scientific Integrity. These new definitions are important because their supporters believe they should replace the current definitions used by NSF and PHS.

NSF's definition is an example of the current federal definition. NSF defines misconduct in science and engineering as:

> *(1) fabrication, falsification, plagiarism, or other serious deviation from accepted practices in proposing, carrying out, or reporting results from activities funded by NSF; or*
>
> *(2) retaliation of any kind against a person who reported or provided information about suspected or alleged misconduct and who has not acted in bad faith.*

This definition is comprehensive, and its application depends on the involvement of the peer community. In this definition, the "other serious deviation from accepted practices" phrase states the operational standard for ethics as historically implemented in the scholarly professions. According to this operational standard, members of the scientific community set the standards by their practices. To make the definition work, the scientific community must be involved. At NSF, this representation occurs in the investigative and the adjudicative stages of handling allegations of misconduct in science.

The NAS COSEPUP Panel report on *Responsible Science: Ensuring the Integrity of the Research Process* appeared in April 1992. The Panel's definition limits misconduct in science to fabrication, falsification, or plagiarism in proposing, performing, or reporting research. NAS has recommended this definition to government agencies, universities, and other research institutions as a replacement for current definitions.

The differences between NSF's and NAS's definitions of misconduct in science arise from what is **not** captured in this new definition. The "other serious deviation from accepted practices" phrase is not included because the committee found it vague and because it felt that "a misconduct complaint could be lodged against scientists based solely on their use of novel or unorthodox research methods." The NAS press release said the "other serious deviation" phrase could stifle innovative research. We believe that the current NSF definition is more appropriate for three reasons. First, we do not believe that the phrase is vague; clarification is as near as the peer community. Second, as we have explained before, we find no evidence that scientists cannot distinguish innovative research from an act of misconduct in science, as the NAS report implies (see Semiannual Report No. 6, pages 17-19). Third, NSF has stated as a matter of law that ordinary differences in interpretations or judgments of data, scholarly disagreements, or personal or professional opinions "are not, and could never be misconduct" under NSF's definition (see 56 Fed. Reg. 22287 [May 14, 1991]).

Because the recommendation of the NAS report does not include the "other serious deviation" phrase in its proposed definition, we believe the NAS definition is more limited in scope than the current NSF definition, and it fails to include known and readily hypothesized cases of misconduct. For example, the NAS's report specifically states that tampering with other researchers' experiments would not constitute misconduct in science. We strongly believe that tampering with another's experiments is a form of misconduct.

In June 1992, the PHS Advisory Committee on Scientific Integrity formulated the other definition. This Committee decided to recommend that the PHS definition of "scientific misconduct" be replaced with a definition of "research fraud": "Research fraud is plagiarism; fabrication or intentional falsification of data, research procedures, or data analysis; or other deliberate misrepresentations in proposing, conducting, or reporting research."

Here, the use of the terms "fraud" or "deliberate misrepresentation" is a limitation on the definition of misconduct. "Fraud" and "deliberate misrepresentation" carry the connotations of their common law origin and use. This requires, among other things, a showing of "intent to deceive" and/or "detrimental reliance" which is beyond what plagiarism, fabrication, or falsification require under our current misconduct definition. The PHS Advisory Committee's definition would cover only the extreme end of the spectrum of misconduct in science.

Further, the introduction of "intentional falsification" places a specific burden on an investigation to assess intent, which is a complex legal

undertaking. University faculty members do not assess intent as part of their everyday research and therefore are not familiar with this legal activity. "Deliberate misrepresentation," which requires proof of "deception" as well as intent, shares and exacerbates the same problem. The PHS Advisory Committee's definition of research fraud holds the potential for making lawyers the key players for misconduct in science cases, replacing scientists and engineers. This will not be science governing itself, as was envisioned by the National Conference of Lawyers and Scientists when they recommended an informal process not dominated by lawyers handling allegations of misconduct in science. Lawyers, along with investigators, play an essential role as part of an inter-disciplinary team in our misconduct cases. However, scientists and engineers—who are familiar with the mores of science—must always lead the process.

At this point, we believe that the government should resist both new definitions because neither definition can creditably handle the range of misconduct cases encountered. Therefore, we intend to oppose these changes in NSF's current definition of misconduct because the resulting definitions fail to fully protect the public interest.

# ILLUSTRATIVE MISCONDUCT CASES

We closed two plagiarism cases in this reporting period that illustrate difficulties that universities often have in conducting thorough investigations and in addressing the issue of intent. We also closed one case involving six allegations about authorship and fraudulent representation of experimental results.

## Plagiarism at An Eastern University

We received an allegation that a chemist at a private eastern university had submitted to NSF proposals containing material plagiarized from a published article. We informed the subject's university about the allegation, without identifying the complainant, and offered the university the opportunity to investigate the allegation.

The university investigation found that the subject's proposals contained ideas and exact phrasing from the article, but that the subject had failed to give any attribution to it. The subject admitted he had read the article and had taken extensive notes from it, subsequently incorporating material from those notes into his proposals without giving the authors the credit that was justly due them for their original idea. The investigation found an earlier proposal to NSF in which the subject had similarly copied from the same article without attribution. It also found material in one proposal that was copied without attribution from another paper by other authors.

The subject's defense was that the omission of a citation to the article was an oversight. He explained that when he read journal articles, it was his habit to take notes in which he often copied from the articles verbatim. These copied passages were mixed together with his own elaborations, and he often did not write in exact source references. When he wrote proposals, he used the notes and sometimes copied from them verbatim. By that time, however, he had often forgotten that he was putting into the proposal material taken from the articles, and he did not check his sources before sending the proposals to NSF.

When the university's investigating committee asked to see the notes, it was told that the subject had destroyed them at the suggestion of his department chair when he moved into a new and smaller office. The committee apparently took his word for this, without interviewing anyone else or looking for the notes. It also did not look into inconsistencies between the subject's defense to the committee and his earlier explanation to us.

The committee found that the subject had violated professional standards of research scholarship and was therefore guilty of unacceptable negligence and hence of research misconduct. The university treated this matter quite seriously and imposed severe sanctions. However, it did not find that the subject had committed plagiarism, which would potentially be grounds for termination under university guidelines, because it did not believe that he intended to deceive. Its reasons included: (1) the subject showed a pattern of carelessness in his research procedures, (2) some NSF reviewers detected the copying and therefore were not misled by it, and (3) the subject would not have committed plagiarism in proposals he knew were going to be reviewed by experts.

In our view, these arguments do not show any lack of intent to deceive and are not convincing. There is no inconsistency between having a pattern of carelessness and being a plagiarist. If plagiarism is detected, it is still plagiarism. Unfortunately, some scientists have been foolish enough to commit misconduct in science, even in situations where they should have expected to be caught.

More broadly, NSF does not make a separate investigation into a subject's intent in deciding whether there was plagiarism. NSF looks at the overt facts: the copying from a certain source without giving appropriate credit. These facts usually say all that is needed about the subject's intent. To look for other evidence moves the investigation into obscure psychological issues. University committees that attempt this commonly do not show a clear idea of what sort of evidence they are looking for, and do not find it. They often produce weak arguments that suggest some doubt about the subject's intent, and on that basis, they conclude that they cannot reach a finding that the subject committed the alleged misconduct. Instead, they usually find that the subject was "negligent" or "careless" to some degree.

We decided that this was a case of plagiarism, within NSF's understanding of plagiarism, and we prepared an investigation report recommending that NSF issue such a finding. The Deputy Director of NSF has issued a finding that the subject committed plagiarism under the NSF misconduct regulations.

In addition, a settlement has been reached between NSF and the subject.

The subject accepted his institution's directive not to apply for federal grants before December 19, 1993. Under the settlement, for 4 years from the date NSF referred this matter to the institution, the subject will have all grant applications reviewed by a university official to ensure that the subject has engaged in proper research practices. On those occasions, he will certify in writing that he has recently reviewed his institution's guidelines on misconduct in science, and that his grant application is free of such misconduct. On this basis, we have closed this case.

## Major Midwestern University Finds Lack of Evidence for Plagiarism

This case has many of the same features, including, unfortunately, an investigation by the university that left certain issues unresolved. This allegation was made to the university, which in accordance with NSF regulations, informed us that it was beginning an investigation into possible misconduct. The subject was a professor who was accused of plagiarism in a proposal submitted to NSF. The professor allegedly copied material from a graduate student's dissertation and from a book chapter that the two of them had written jointly, and had not given proper credit.

The university investigation found 12 passages in the proposal that matched passages in the book chapter and dissertation. Those passages did not contain proper attribution. The university decided to consider only one of the passages, which matched a passage in the chapter. Since the chapter was coauthored, and the subject and graduate student disagreed about who was the author of this particular passage, the committee found that it could not decide whether the graduate student's work had been plagiarized. At this point it would have been reasonable to look at the passages that matched the dissertation, which was not coauthored. In our view, the decision not to consider all of the evidence was unjustified.

The committee adopted a working definition of plagiarism that included the notion of intent. To prove that there was plagiarism, it was necessary to prove that the subject had either an intent to deceive others into believing that she was the author of the copied materials or an intent to deprive the author of due credit.

The committee found that there was no intent of either kind. One of its reasons was that the dissertation and chapter were cited in the portions of the proposal where original work and original ideas were discussed. The copying without attribution was only in the literature review section of the proposal. The subject claimed that this section was routine and contained no new ideas, implying that no citation was needed.

The committee found that the subject was not guilty of plagiarism. However, it decided that the subject had erred as a mentor in not acknowledging the graduate student's contributions and in not informing the student of how they were going to be used.

We notified the university that we thought it was a mistake to deal with only a part of the evidence. We particularly disagreed with the opinion that plagiarism cannot occur in a literature review. We noted that the committee's discussion of intent confused the two kinds of intent and was not always convincing. However, after reviewing all of the evidence, we concluded that there was not a preponderance of relevant evidence to support a finding that the subject had copied more than a minimal amount of the graduate student's words or ideas. On this basis, we closed this case.

## Allegations of Excluded Authorship and Fraudulent Research Results Investigated But Found to be Without Merit

A major eastern research university informed us that it had completed an inquiry of alleged misconduct and intended to begin an investigation related to an NSF grant. At the university's request, we deferred the investigation to the institution. The allegation of misconduct was made by a faculty member in the Department of Computer Science against a graduate student in the same department. The alleged misconduct involved three submissions of papers without the professor's knowledge or consent and three instances of fraudulent representation of experimental results. After a 5-month

investigation, we received the university's investigation report.

As described in its report, the investigating committee evaluated each of the professor's six specific allegations and concluded that no misconduct occurred. Specifically, regarding the three papers, the committee found that (1) one submission made without consulting the complainant was unscholarly behavior, but not plagiarism; (2) the second submission was based on implied permission by the complainant; and (3) the third paper was not a basis for misconduct because it existed only on the subject's computer as an unsubmitted working draft that listed three coauthors, including the student and the professor.

Regarding experimental results, the investigating committee found that (1) contrary to the allegation that the student preselected input to an experiment in order to achieve a desired result, the professor failed to provide adequate supervision to avoid what the committee found to be poor methodology rather than misconduct; (2) instead of the student misleading the professor as alleged, there was merely misunderstanding, caused by mutual failure of the graduate student and professor to cooperate and communicate with each other; and (3) contrary to the professor's allegation, the student did not fake a graph.

Within the 30 days allotted, we notified the university that we found the university's procedures to be fair and that its final investigation report was complete and accurate. We accepted the university's investigation report, including its findings of "no academic misconduct" for each of six allegations as well as the reasons for reaching those conclusions and closed this case.

# FOLLOWUP ON PREVIOUSLY REPORTED SIGNIFICANT CASE

## Plagiarism in Proposal From Small Southern University

In previous reports (Semiannual Report No. 5, pages 32-33, and Semiannual Report No. 6, page 21), we discussed a case we have sent to the Deputy Director of NSF for adjudication. The subject was accused of plagiarism in a proposal to NSF. His institution had investigated the matter and had issued a finding of carelessness amounting to misconduct in science. However, the institution had decided that this carelessness was not serious enough to be plagiarism. We regarded this as an instance of plagiarism and recommended that the Deputy Director make that finding and debar the subject from receiving all federal grant funds for 2 years.

The Deputy Director accepted our recommendation and sent the subject a Notice of Proposed Debarment. During this reporting period, this matter was resolved by a settlement between NSF and the subject. The subject agreed that his copying was plagiarism under the NSF misconduct regulation and was improper. The subject stated that this was the only instance in which he used the work of another without attribution, that he was genuinely remorseful for doing it in this case, and that he would not do it again. He agreed not to submit proposals to NSF, or be among the senior personnel on an NSF grant or cooperative agreement, for 2 years. During that period, he will notify any federal agency to which he applies for assistance that he is voluntarily excluded from NSF funding, if the agency requires such certification. With this agreement, NSF agreed to close the matter.

# SEMIANNUAL REPORT TO THE CONGRESS

**number 8**

October 1, 1992 - March 31, 1993

**Office of Inspector General** **National Science Foundation**

# OVERSIGHT

The Office of Oversight focuses on the science-engineering-education-related aspects of NSF operations and programs. The Office conducts and supervises compliance, operations, and performance audits as well as investigations of NSF's programs and operations. The Office handles all allegations of nonfinancial misconduct in science, engineering, and education and is continuing studies on specific issues related to misconduct. The Office oversees the operations and technical management of approximately 200 NSF programs, undertakes inspections, and performs special studies.

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Misconduct in Science and Engineering

***Fabrication, falsification, plagiarism, or other serious deviation from accepted practices in proposing, carrying out, or reporting results from activities funded by NSF; or retaliation of any kind against a person who reported or provided information about suspected or alleged misconduct and who has not acted in bad faith.***

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## MISCONDUCT IN SCIENCE AND ENGINEERING

*The Office of Oversight is responsible for processing all allegations of misconduct in science and engineering related to NSF proposals and awards. This Office is also responsible for recommending policies that address the problem of misconduct and foster ethical scientific practices. As part of a continuing effort to inform the community about misconduct policy and procedures, we have prepared the following discussion of investigations resulting from allegations of misconduct.*

### What OIG Looks For In University Investigation Reports

Under NSF's regulation on misconduct in science and engineering, we usually send an allegation of misconduct to the university that employs the accused individual for investigation. At the end of its investigation, the university sends us a report for evaluation. As a result of our evaluation, we may send the university questions about its investigation, may request further information, or may perform an investigation of our own. When we have a satisfactory investigation, we decide whether to recommend that NSF make a finding of misconduct and impose a sanction. We evaluate the university's investigation solely in terms of whether it is

accurate and complete enough for us to use in making our recommendation. Below is a discussion of some of the recurring problems we have noticed in our evaluations of university investigation reports.

**Expert Conflicts of Interest.** We have noted that some individuals who serve on university investigation panels have possible conflicts of interest. There are a variety of personal and professional relationships between panel members and the individuals involved in the case that may compromise the credibility of the university's investigation. The university should resolve possible conflicts of interest before the panel commits a significant amount of effort to the investigation. To help preclude such problems, we now ask for a curriculum vitae for every panel member at the beginning of the investigation. Individuals who testify as experts during the investigation may also have conflicts that can compromise the investigation. On the other hand, the investigating panel will obviously have to interview persons who are directly involved in the case. Their involvement will have to be considered in evaluating their testimony.

**Failure to Use All Relevant Evidence and Witnesses.** We have also found that some investigations are incomplete. An investigating panel has to request and examine all relevant documents and interview all relevant witnesses. However, in our experience, they often do less than this. For example, they may fail to interview relevant witnesses if such witnesses are on another campus and the investigators prefer not to make the existence of the case known outside their own institution. While we appreciate the need to keep misconduct cases confidential, once an investigation is begun, it has to be performed thoroughly. Failure to interview witnesses or request documents may also be due to an excessive willingness to believe the accused individual. That person's account of what happened is often taken at face value and written into the investigation report without an adequate attempt to find evidence that would support or refute it. Panels investigating misconduct cases have to take seriously the possibility that a witness is not telling the truth. An investigation is also incomplete if it does not consider relevant allegations that were not made at the beginning of the investigation but that surfaced during the investigation.

**Poor Analyses of Evidence.** Some investigation reports do not provide cogent analyses that lead to the panel's conclusions and recommendations. For example, poor arguments often appear in discussions of the accused party's intent. Many in the scientific community feel that intent should be considered in misconduct cases. Intent is frequently introduced into the investigation of individual cases, and it is also prominent in policy discussions about the definition of misconduct (see the National Academy of Sciences' Committee on Science, Engineering, and Public Policy Panel Report *Responsible Science: Ensuring the Integrity of the Research Process*, pages 27-28, and the new definition under consideration by the Public Health Service).

University investigating panels often feel that they cannot make a finding of misconduct in science without proving intent. However, the attempt to prove intent places a considerable burden on such panels. The persons serving on these panels typically have not dealt with the subject of intent previously, and they receive little guidance. It is true that inexperienced jurors in court trials frequently assess intent, but they benefit from the instructions of the judge and the arguments of the attorneys for the two sides. University panels usually do not have this assistance. They often do not distinguish between different intentions or between different levels of intent, and they often are not clear about what would constitute evidence of the presence or absence of intent.

University panels sometimes neglect to consider whether reckless actions, in addition to actions done deliberately, can be misconduct in science.

Subjects of investigations sometimes argue that their conduct was not deliberate; they assert that they did not intend to mislead anyone, including NSF. However, in one case, NSF found that an individual engaged in misconduct when his behavior was reckless, even if there was no proof of "intent to deceive" or of "deliberate" actions. If a university investigation considers intent and concludes that the subject's behavior was not deliberate, it should also address whether that behavior was grossly negligent or reckless.

**Standard of Proof.** The problem of assessing intent may be compounded by the question of which standard of proof to use. In NSF's regulation on misconduct in science and engineering, the specified standard is "a preponderance of the relevant evidence." Many universities use this standard, but some use more stringent standards, such as "clear and convincing evidence" or "beyond a reasonable doubt." Moreover, some university investigation reports do not clearly state which standard they are using. 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 therefore cannot reach a conclusion about misconduct in science. 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.

If a university panel uses a standard of evidence that is different from NSF's, or does not state its standard, we may ask it to reevaluate the case in terms of NSF's standard to help NSF's resolution of the case. This may also happen if the panel has used a definition of misconduct in science that is significantly different from NSF's definition.

**OIG's General Policy.** Universities should understand that when we send them an allegation, we are not accusing the individual of misconduct. At that stage, we take no position concerning the truth or falsity of the allegation. We are passing on an allegation we have received that we believe the institution will want to resolve. We give the institution the opportunity to conduct the investigation, but we will conduct the investigation if the institution prefers that we do so. Most universities try to resolve the case on its merits. However, a few investigation reports suggest that the university considers the allegation received from NSF to be an unwelcome intrusion. The university may deal with this intrusion by imposing a sanction it believes NSF wants, when it has actually found no misconduct, or it may try to defend the accused party against what it sees as an accusation by NSF. These actions reflect a misunderstanding of the roles of NSF and the university in misconduct cases.

## Principal Investigator At Eastern University Is The Subject Of Multiple Allegations

We received seven allegations from a postdoctoral researcher against an NSF-supported faculty member at a southeastern university. The allegations arose during the revision of a coauthored manuscript, which was to be submitted to a scientific journal for publication. Four of these allegations are highlighted here to provide examples of the various methods we use to resolve allegations of misconduct in science.

**Falsification of Data in an Abstract by the Subject.** Our initial inquiry determined that a full evaluation of this allegation required a review of relevant laboratory notebooks. The institution requested that it be allowed to conduct the inquiry and any possible investigation into the allegation. The institution's inquiry committee conducted interviews and reviewed two relevant laboratory notebooks and the subject's relevant publications. The committee concluded that the abstract in question was not clearly written, and, if it was read in isolation, was subject to misinterpretation. However,

based on a broader understanding developed through interviews, examination of the laboratory notebooks, and reviews of the related publications, the committee concluded that there was no substance to the allegation. We reviewed the committee's inquiry report and concluded that its inquiry and finding of no misconduct could be adopted in lieu of any inquiry or further action by OIG.

**Subject Failed to Submit Revised, Coauthored Manuscript for Publication.** From materials supplied by the complainant and the subject, we determined that three issues were relevant to this allegation: a scientific dispute over the interpretation of the complainant's original data, the absence of complete laboratory records to document the complainant's original experiments, and the complainant's failure to create the new data necessary to revise and resubmit the rejected manuscript.

The complainant acknowledged that she relied on other laboratory personnel to record mainly her successful experiments and associated data. The subject provided documentation to show that some of the laboratory records needed to respond to the reviewers' comments were missing from the laboratory notebooks. After the manuscript was rejected, the subject decided to repeat the entire set of experiments because of his concern over the relevant issues outlined above. The subject's results conflicted with the complainant's earlier results. In our view, it is doubtful that the costly and time-consuming repetition of experiments would be undertaken only to suppress the complainant's data. We determined that this was a dispute between the subject and the complainant on properly collecting, recording, and interpreting scientific data, not an allegation of misconduct in science. We believe that this situation also points out the importance of individual researchers maintaining meticulous and accurate records of experimental results in laboratory notebooks.

**Misrepresentation of Data in the Subject's Abstracts.** The complainant alleged that the subject had misrepresented data gathered from one experimental system as being collected from another. To assess this allegation fully, we included a confidential, scientific review of the relevant materials by an expert outside OIG. The outside expert found no evidence that the subject misrepresented his data. Using the expert's determination, as well as our own judgment, we concluded that this allegation lacked substance.

**Subject Submitted a Proposal to NSF that was Based on Faulty and Unpublished Data.** The complainant requested that we review the merit of a specific proposal from the subject because the complainant felt it was based on faulty and unpublished data. We determined that this request was an extension of, and based upon, two other allegations that we found were without substance. In fact, the subject had prepared at least six abstracts and one paper related to the work described in his proposal. Further, determining the merit of an individual's research proposal is part of NSF's proposal evaluation process; it is completely separate from OIG's function. Similarly, the evaluation of misconduct allegations is not a function of NSF programs.

Our investigation of the other, minor allegations did not find any evidence of misconduct in science, and we closed this case. The analysis of the allegations in this case demonstrates the variety of techniques OIG can rely on when gathering and reviewing information pertinent to an allegation.

## Article on the Potential Liability of Panels Reviewing Allegations of Misconduct

An article written by OIG legal staff entitled, "Liability of Individuals Who Serve on Panels Reviewing Allegations of Misconduct in Science," was published in the Villanova Law Review. Research institutions generally use peer committees to investigate allegations of misconduct in science. Scientists may come to perceive participation on misconduct committees as too risky to their own careers because of the increased public attention to misconduct in science and the possibility of becoming involved in expensive, time-consuming litigation. Because participation on the committees is voluntary, this perceived risk of liability may completely discourage scientists from serving on them. Should this occur, the scientific community's ability to address and resolve occurrences of misconduct in science would be compromised.

The article addresses the legal concerns committee members might have about liability stemming from participation in misconduct investigations conducted pursuant to federal regulations regarding misconduct in science in federally funded research. The most likely cause of action against an institution or its misconduct committee members is defamation, so the article discusses the elements of a defamation claim against members of institutional misconduct committees.

The good faith participation of committee members in misconduct investigations should not lead to any liability for defamation. Committee members should be protected by at least a qualified privilege, and they may receive a common law absolute immunity for their quasi-judicial actions. However, even with the protection afforded under the common law qualified privilege and institutions' indemnification policies, committee members who are the subject of allegations of bad faith or malice would still be exposed to the time and expense of litigation. The article suggests that, although current law would likely adequately protect individuals who serve on misconduct panels, the best way to protect such individuals from the expense and inconvenience of frivolous litigation is through a federal statute granting absolute immunity.

# SEMIANNUAL REPORT TO THE CONGRESS

**number 9**

April 1, 1993—September 30, 1993

**Office of Inspector General  National Science Foundation**

# MISCONDUCT IN SCIENCE AND ENGINEERING

## Policy Discussions Concerning Misconduct in Science

We continue to follow the ongoing dialogue on misconduct in science. This semiannual report contains four policy discussions that address recent developments. The following two discussions concern the definition of misconduct in science and respond to continuing debate over that subject. Two other discussions, one on the role of intent in misconduct cases and another on the Department of Health and Human Services' (HHS) new policy of publicly identifying all persons against whom it has made misconduct findings, are in the Legal section of this report. OIG scientists and lawyers contributed to all four policy discussions. These discussions do not preempt or prejudge issues that are within the jurisdiction of NSF management, including issues that can only be decided when NSF's Director or Deputy Director review particular cases.

### Congress and the Definition of Misconduct in Science

NSF and HHS define "misconduct in science" essentially identically, as fabrication, falsification, plagiarism, or other serious deviation from accepted practices. Some recent policy discussions criticizing this definition have suggested that Congress intended to limit the authority of federal agencies in this area to "scientific fraud," which is perceived to be substantially narrower in scope than "misconduct in science." The expression "scientific fraud" is promoted because it would include within the government's purview only cases involving deception. However, analysis of the legislation and its history does not reveal congressional intent to limit the authority of federal agencies to ensure the integrity of their programs. In our view, an agency would not be conducting adequate oversight of its programs if it ignored acts of misconduct in science merely because they did not constitute "fraud."

In the 1980's, congressional subcommittees held several hearings to gather information on misconduct in science. These hearings tended to focus on egregious cases of misconduct in science that involved biomedical research projects funded by HHS. Because of the perceived inadequacy of HHS's handling of these cases, Congress responded to these hearings in 1985 by adding section 493 to

**NSF's Definition of Misconduct in Science and Engineering**

Fabrication, falsification, plagiarism, or other serious deviation from accepted practices in proposing, carrying out, or reporting results from activities funded by NSF; or retaliation of any kind against a person who reported or provided information about suspected or alleged misconduct and who has not acted in bad faith.

the Public Health Service (PHS) Act. Section 493 is titled "Protection Against Scientific Fraud," and requires that HHS establish procedures for responding to "scientific fraud."

Section 493 does not define "scientific fraud." Some critics have asserted that when Congress referred to "scientific fraud" in section 493, it intended something much less than the "misconduct in science" definitions that NSF and HHS later implemented and therefore NSF and HHS acted beyond their statutory authority.

First, every agency has the intrinsic authority and responsibility to protect the integrity of the programs that it funds. Section 493 of the PHS Act does not apply to NSF or any federal agency other than HHS, and it also in no way limits HHS's authority to define, proscribe, investigate, adjudicate, and sanction misconduct in science under agency programs: like all federal agencies, HHS had such authority before section 493 was enacted, and it has it now. The focus of the hearings and legislative climate that produced section 493 was the perceived inadequacy of HHS's response to some if its cases; Congress' objective was to force HHS to establish procedures and take action. When Congress enacted section 493, it intended to force HHS to carry out its *responsibility* to protect the integrity of its programs; there is no evidence that Congress intended to limit HHS's *authority to do so.*

Further, there is no evidence that Congress had a specific meaning in mind when it used the expression "scientific fraud" in section 493. When Congressman Henry Waxman introduced the bill in the House of Representatives, he referred to the new section 493 as providing a "system for investigating reports of scientific misconduct." The section in the conference report that discusses section 493 is entitled "Scientific Misconduct," and uses the terms "misconduct" and "fraud" interchangeably, even within the same sentence.

And finally, regardless of what Congress may have intended when it used the word "fraud" in section 493 in 1985, Congress has now amended that section to use the "misconduct" language used by HHS and NSF. The current NSF definition was proposed and finalized in 1987 and amended in 1991, and HHS's definition was proposed in 1988 and finalized in 1989; both definitions eschewed the word "fraud" in favor of "misconduct." At the beginning of 1993, Congress amended section 493 of the PHS Act so that it now refers to "research misconduct" and explicitly gives to HHS the authority to define that expression.

There is no indication in the legislative history of the 1993 amendment that Congress was dissatisfied with the NSF and PHS definitions or that Congress intended for HHS to change its definition. To the contrary, the House report accompanying the amendment explains that this new terminology was chosen "to clarify that coverage is not confined to basic research or any other narrow subcategory that might be suggested by the more traditional terms such as 'scientific' misconduct." The House report directed that the definition promulgated by HHS "should include practices which seriously deviate from those that are commonly accepted within the scientific community and that materially and adversely affect the integrity of research." Similarly, the conference report accompanying the amendment discussed the need for the establishment of "Federal standards governing research integrity" and emphasized that "abuses or deviations from these standards must be uncovered and promptly dealt with in a serious and credible manner."

Moreover, Congress expressed its approval of the current definitions in another forum, a committee report that accompanied the 1993 appropriation bill for the Office of Science and Technology Policy (OSTP). In that report, the committee noted that:

*OSTP intends to develop . . . a Government-wide definition of misconduct . . . . the Committee believes the definition should . . . ensure that Government sanctions can be imposed against any researcher who acts inappropriately. . . . in that regard, the Committee is strongly supportive of the definition . . . developed by the National Science Foundation.*

These are clearly not the actions of a Congress intending that the federal agencies that fund science should cut back on the scope of their efforts with regard to scientific integrity.

### "Plagiarism" and "Falsification" in the Definition of Misconduct in Science

Some recent policy discussions on the definition of misconduct in science employed at NSF have proposed that the phrase "other serious deviation from accepted practices" should be dropped from the existing definition. These discussions suggest that the definition should consist only of falsification, fabrication, and plagiarism, the three examples of serious deviation contained in the current definition. This section suggests difficulties that might emerge if the definition were limited to falsification, fabrication, and plagiarism.

One reason given for wishing to change the definition is that the current definition is excessively broad and vague. A definition consisting only of falsification, fabrication, and plagiarism is supposed to be narrow and precise enough that government application of it will be predictable and scientists will know what they are not supposed to do.

To make the definition specific, some writers recommend definitions for the individual terms. Unfortunately, these definitions have to be excessively broad in order to capture the cases that are now covered under "other serious deviation from accepted practices" and that need to be covered by any definition. In addition, they turn out to be vague in their own way.

For example, it has been suggested that plagiarism should be defined as "misappropriation of intellectual property." However, that is a vague term that itself raises serious problems of interpretation. Under such a definition, any offense that in some conceivable way pertains to the possession or ownership of intellectual property would be treated as plagiarism and therefore as misconduct in science. This happens because the proposed definition does not say what relation the offense has to have to intellectual property. In addition, it does not attempt to say which practices involving intellectual property should be considered "misappropriation." Hence, the range of possible cases that might fall under such a definition of plagiarism would be quite unpredictable.

The proposed definition of plagiarism has been applied to a well-known case of alleged data falsification involving two scientists employed at the PHS, where the issue is said to be the "misappropriation" of a virus. It is surprising to see such a case classified as plagiarism.

A second example is a widely reported case at Michigan State University in which a graduate student was accused of withholding data from her collaborators over a long period of time. While a visiting inquiry committee treated this as an "other serious deviation," it has also been called a misappropriation of intellectual property and therefore plagiarism, which goes far beyond the usual understanding of that term.

Thus, the proposed definition raises issues of interpretation much like those raised by the "other serious deviation" phrase. In both cases, the solution is the same, that is, to rely on the standards of the relevant community of scientists as the criteria for what is or is not misconduct. The crafting of words in the definition cannot substitute for this.

The violation of the confidentiality of peer review is a practice NSF would call an "other serious deviation." However, this practice is sometimes placed under the broadened definition of plagiarism as violation of intellectual property in order to make the "other serious deviation" phrase unnecessary.

This effort does not succeed because some ways of violating confidentiality do not involve intellectual property. For example, it is a

violation of confidentiality to reveal the names of reviewers or the scores that individual reviewers have given to grant proposals or fellowship applications, but these are not intellectual property matters.

When a breach of confidentiality occurs that also involves a violation of intellectual property, these are two distinct elements of the case. Hence, it is not accurate to describe such cases exclusively as "plagiarism" cases. In general, all violations of confidentiality involve an offense that goes beyond even a broad definition of plagiarism, and the "other serious deviation" phrase is needed in order to deal with them.

There have also been proposals with regard to defining the term "falsification." It has been suggested that this should be defined as "changing data or results." However, the same authors apply the term "falsification" to practices like misrepresenting one's qualifications and achievements in a grant application. This practice is widely regarded as misconduct in science and is currently covered by the "other serious deviation" phrase. Since information about one's qualifications and achievements is not "data or results," the misrepresentation of that information is not "falsification" as defined. The reference to "data or results" makes this definition too narrow to cover the desired case.

However, in other respects, this definition is excessively broad. "Changing data or results" is an expression that might apply to any kind of data reduction or statistical analysis. Hence, it is not suitable for use in a government agency's definition of misconduct in science.

As these examples demonstrate, it is far from easy to develop a new and practical definition of misconduct in science. The current definition of misconduct in science ensures that NSF can take action in all appropriate situations, and we believe that it is essential for NSF to maintain its authority to do so. We look forward to working with the other federal agencies and the scientific community regarding these issues.

## SIGNIFICANT MISCONDUCT CASES

### Misconduct Finding and Actions Recommended Against College

For the first time, we have recommended that NSF make a finding of misconduct in science against an institution and take appropriate action. Previously, we have made such recommendations only with regard to individuals. This case involves two PIs who were employed in the college of engineering at a southwestern university. The PIs submitted three proposals and two letters to NSF that contained false statements. We determined that the college also shared responsibility for these misrepresentations.

The false statements exaggerated the extent of the services that the college offered to Native American and Hispanic undergraduate students. These statements strengthened the proposals when they were reviewed at NSF. The proposals were submitted to NSF education programs, which place special emphasis on projects that serve minorities that are underrepresented in science and engineering.

The PIs sent a total of eight false statements to NSF in various documents. For example, several statements indicated that the program for Hispanic students had awarded 20 full scholarships. In fact, it had awarded no full scholarships. Similarly, the Native American program was said to award 20 full scholarships per year. In fact, it had only awarded 20 full scholarships altogether. In response to an inquiry from NSF, 1 of the PIs later revised this statement to say that the Native American program awarded only 10 scholarships per year after the 20 scholarships that were awarded in the first year for a total of 50 over 4 years. To support this revised statement, the PI provided lists of students receiving these additional 10 scholarships. We learned that these students were not actually receiving new scholarships, but were only replacing dropouts. In fact, the program was in such difficulty that the number of awardees had fallen to seven. We regarded this further misinformation and this concealment of information as aggravating the original offense.

We referred the matter to the U.S. Attorney, who declined to pursue this matter. We are treating this case as misconduct in science, under the "other serious deviation from accepted practices" provision. We have sent our investigation report on this case to NSF's Office of the Director with the recommendation that it issue findings of misconduct in science and take action against the two PIs and the college.

Because of actions and omissions by the dean, the associate dean, and a department chair (the first PI), we believe that the college as a whole shares responsibility for the false statements sent to NSF. However, we were told that no one in the college administration took responsibility for assessing the accuracy of representations about the college when reviewing and clearing the proposal. We consider this unacceptable because the statements at issue are about matters that are within the college administration's knowledge and control. We do not expect the institution's reviewing officials to review the technical content of proposals, and institutions ordinarily bear no responsibility if the proposal contains false statements about science or engineering. However, institutions are expected to take responsibility for the truth of statements in proposals that concern matters within the purview of the institution itself, such as the minority programs that those institutions operate.

This case illustrates the importance of providing accurate information in proposals. This applies in particular to claims about services offered to minorities when these services may be criteria used in evaluating those proposals. Institutions should ensure that statements on these matters are correct.

**Plagiarism in a Proposal Submitted to NSF**

We received an allegation that a faculty member at a midwestern university had plagiarized sections of her Research Experiences for Undergraduates (REU) proposal from a funded REU proposal, which was previously submitted by the complainant. We were informed that the institution was evaluating the allegation, and we waited for the results of the evaluation before deciding how to proceed. We learned that there were two evaluations of this allegation at the institution.

By reviewing the documents associated with the institution's two evaluations, we determined that the subject had, at a previous department chairman's suggestion, obtained the departmental copy of the complainant's proposal. In preparing her proposal, she had copied a total of four pages of text from that proposal into her proposal.

In the first evaluation, the chairman concluded that much of the copied material was "boilerplate" and that some of the copied material was part of the proposed work but, that text was so stringently dictated by the NSF program announcement that little latitude was left for the language that could be used in a proposal.

The Chairman concluded that the subject's actions were naive and unintentional and did not constitute serious "academic dishonesty." A letter describing the evaluation was placed in the subject's personnel file at the institution, and the subject voluntarily withdrew her proposal from consideration at NSF.

After reviewing the materials supplied by the institution, we concluded that they did not convey the results of a complete investigation. We completed the investigation by gathering the subject's views on the allegation and reviewing relevant documents.

The subject confirmed that she had copied or closely paraphrased materials from the complainant's proposal without his permission and without providing him an acknowledgement because she thought they were "standard" materials. The subject's proposal did not cite his original proposal as the source for the copied materials.

Language that is freely available to all faculty members and is used routinely in proposals submitted by a department can be considered "boilerplate." The subject informed us that such material did not exist in this department. In this case, the copied material determined by the institution to be "boilerplate" was unique to the complainant's original proposal. The complainant was unaware that his proposal was being "shared" with other faculty members.

The copied material the chairman identified as part of the proposed work was not, as he portrayed, stringently dictated by the NSF brochure. That brochure provides guidance on the important topics to be included in a proposal and emphasizes the importance of these topics in NSF's evaluation of the proposal. The subject agreed that the NSF brochure did not dictate the text to be used in the proposed work. The subject said that although she viewed the material she had copied as "stereotyped supporting materials," she should have obtained the complainant's permission before using it.

We regard using the words or ideas of another person without permission and attribution as plagiarism, even if the copied material is a description of common facilities or faculty. In deciding whether plagiarism occurred, the presence of unattributed, copied material in a work is not mitigated by the presence of original text in that same work.

We recommended, and NSF's Deputy Director found, that the subject committed misconduct, specifically plagiarism, under NSF's definition of misconduct in science and engineering. We also recommended, and NSF's Deputy Director accepted, the following sanctions: for a 3-year period, any proposal the subject submits to NSF should be accompanied by a certification to OIG of her present responsibility and her understanding of ethical conduct. The institution should also include with each certification its own assurance that the proposal appropriately acknowledges all original sources of information.

### Plagiarism in SBIR Proposals Due to Common Third Source

An NSF program officer reported that under the SBIR solicitation, two investigators had submitted proposals that contained identical language in their discussions of the general research problem and the broad technical approach. OIG contacted both subjects, who reported that the identical material was derived from a proposal written by an academic researcher with whom both had collaborated on industrial development projects. The original author told us that he had inadvertently given both investigators permission to adapt his proposal and submit it for funding. However, both investigators used verbatim excerpts in their submissions to NSF, and cited neither the proposal nor the original author.

We determined that insufficient evidence existed to pursue an investigation of misconduct in science because both subjects had collaborated closely with the original author and had included him as a participant in their proposed research, and both believed in good faith that they had permission to revise and adapt the original author's proposal and then submit it as their own. We concluded, however, that both subjects and the original author should have been more careful. One subject was deceased, and we wrote to the other advising him that he should not have incorporated language from an earlier research proposal by another investigator without indenting the material or enclosing it in quotation marks and without citing the original source. We informed the original author that he should not have given two researchers permission to adapt and submit his proposal without clearly specifying the terms of their collaboration with him or the credit due him for his original contributions to the proposals derived from his work. With these letters, we closed the case.

### Openness Achieved for Social Science Data

This case was brought to us by an NSF program officer who was concerned about a continuing resistance to share data collected under an NSF award by a faculty member of a prominent university. When other researchers challenged the accuracy of her findings, she repeatedly failed to make her data available for reanalysis. Under pressure from the cognizant NSF program office, she eventually placed the data in a public archive, but attached highly restrictive conditions to their use.

The subject's actions were inconsistent with NSF's and the scientific community's commitment to open communication. NSF's *Grants for Research and Education in Science and Engineering* recognizes the importance the scientific community attaches to openness by "expect[ing] investigators to share with other researchers, . . . within a reasonable time, the data . . . gathered in the course of the[ir] work" and encouraging NSF program managers to implement this policy of openness in "the proposal review process [and] through award negotiations and conditions."

After an exchange of letters in which NSF program officers reminded the subject that she had agreed to share these data when she applied for a subsequent grant, the subject agreed to make the data freely available. Her action brought her into compliance with community norms about data sharing, and we decided that the subject's earlier reluctance to share her data was not, as such, misconduct.

We concluded that, with the data now open for scrutiny, the normal processes of scientific evaluation could be counted on to raise any issues of misconduct concerning data collection and analysis if the newly available facts warranted it. This case underscored the importance of data sharing to the progress of science and raised the possibility that under some circumstances persistent refusal to share data might itself constitute misconduct in science.

**Institution Finds Only Minor Plagiarism**

We were informed by a reviewer that a proposal he had received for merit review contained text from a review article he had previously published. The proposal contained one passage that had been copied from the original author's text, but which had not been offset by indentations or quotation marks and was not accompanied by a citation to the original author's work. We found another passage in the proposal that drew on information from the same article but was accompanied by a citation to that review article.

In response to our request for information, the PI on the proposal stated that a subordinate in the PI's laboratory, as a mutually agreed upon first step in establishing the subordinate's independent research program, had written and submitted the proposal for institutional review. After its submission, the institution informed the subordinate and the PI that under institutional rules, the subordinate was prohibited from submitting the proposal. Therefore, the PI agreed to submit the proposal, with minor changes, as the sole PI. The PI stated that the copied material had been added by the subordinate in draft and had been carried forward in subsequent drafts; she was unaware of its presence. The PI's response was accompanied by a statement from the subordinate in which she accepted full responsibility for the copying and corroborated the PI's other statements. We determined that a full investigation into this allegation was necessary and deferred it to the institution.

The institution confirmed the information in the PI's and subordinate's statements and concluded that the subordinate's failure to offset the text or to provide a citation was due to haste and carelessness in preparing the first proposal draft. The committee could not find any evidence that this copying was part of a pattern of behavior.

The institution sent a letter of caution to the PI stating that mentorship responsibilities included providing subordinates with instruction on misconduct issues. A letter of reprimand for committing plagiarism was sent to the subordinate and a copy was placed in her faculty record file.

We found that the institution's investigating committee conducted an accurate and complete investigation. We concluded that after all the mitigating circumstances were considered, among them the subordinate's relative inexperience, the institution's actions were sufficient. Therefore, we closed this case without further action.

**Alleged Breach of Confidentiality of Peer Review**

We recently handled a case involving a breach of confidentiality by panelists reviewing NSF Young Investigator proposals. From discussions with the panelists and the PI who received the confidential information, it was apparent that their views on the confidentiality of panel deliberations varied.

We sought to evaluate the panel's alleged breach of confidentiality to determine what happened and who was involved. Our inquiry confirmed that the PI had approached at least two panelists seeking information about the reasons for his declination. When contacted, the PI expressed the view that the confidentiality of panel deliberations was not an important issue.

Several panelists spoke to us in some detail about the case, revealing that panelists differ in their knowledge of, and attitudes toward, confidentiality requirements. For example, one panelist said that it is quite common for PIs to claim that they know their ranking or to try to find out about their ranking. Another stated that PIs frequently learn their rankings, and that the confidentiality of the review process is breached more frequently than one would expect. A third panelist indicated that he might reveal information about panel deliberations if he had a connection to the PI requesting the information. Some panelists expressed a need for clearer information on confidentiality requirements. This need is being addressed in part by NSF's new form, *Conflict of Interests Statement for NSF Advisory Panel Members*.

In this case, we could not conclude that the candidate actually received information from panelists, nor was it possible to determine, if information was leaked, which panelist was responsible. We closed this case without a finding of misconduct.

However, we did communicate to those involved our view that confidentiality of panel deliberations is essential for open discussion and evaluation during the review process. Disclosure of such information is contrary to NSF policy, and it is the responsibility of both PIs and panelists to respect and maintain that confidentiality. Under some circumstances, breaches of confidentiality in peer review may constitute a violation of NSF's misconduct in science and engineering regulation.

## Policy Discussions Concerning Misconduct In Science

As with the discussions in the Oversight section of this report, these discussions do not preempt or prejudge issues that are within the jurisdiction of NSF's management, including issues that can only be decided when NSF's Director and Deputy Director review particular cases. OIG scientists or lawyers contributed to all four policy discussions.

### Intent

In Semiannual Report No. 8 (page 22), we discussed the difficulty that institutions sometimes have in assessing intent in misconduct cases. We have received inquiries from members of the scientific community including the National Conference of Lawyers and Scientists seeking additional elaboration of our views on intent. We will attempt here to clarify what we understand "intent" to mean and provide some general guidance on how institutions should address the issue when handling an allegation of misconduct in science under NSF's misconduct regulation.

### The Meaning of Intent

A finding of misconduct in science against a subject requires that the subject *both* (1) committed a bad act and (2) did so with a minimal level of culpable intent that justifies taking action against the subject. The "bad act" is sometimes referred to in the law by the Latin expression "*actus reus*," while the level of culpable intent is referred to as the "*mens rea*."

When we discuss "intent," we are inquiring into the subject's *state of mind*. We talk in terms of "levels of intent," which range from *negligent* (also known as careless) to *reckless* (also known as grossly negligent) to *knowing* to *purposeful* (also known as deliberate or willful). A person acts negligently if, according to community standards, that person should have acted differently because a reasonable person in the same circumstances would have acted differently. A person acts recklessly if, according to community standards, that person acts in a way that is a serious deviation from the way a reasonable person would have acted in the same circumstances.

The knowing and purposeful standards require proof that the subject knew what he did; however, NSF's misconduct regulation does *not* require a finding of knowing or purposeful conduct for a finding of misconduct in science.

Fundamentally, NSF's definition of misconduct in science proscribes conduct that is a "*serious deviation* from accepted practices in proposing, carrying out, or reporting results from activities funded by NSF." One of the individuals who drafted this definition held the opinion that a scientist can be found culpable "only if the action in question constitutes *gross* negligence or *reckless* disregard for human welfare, the rights of others, or the integrity of the scientific enterprise." Under NSF's definition, a showing of recklessness is clearly sufficient for a finding of misconduct in science. *After* a finding of misconduct is made, the regulation requires that NSF assess, in the context of "deciding what actions are appropriate," whether the misconduct "was deliberate or merely careless."

In one case that we referred to NSF for adjudication, NSF's Deputy Director concluded that an individual had committed misconduct in science on the basis of the institution's conclusion that the subject's conduct had been reckless. That case, which is discussed in Semiannual Report No. 7 (page 24), illustrates the difference between reckless and knowing or purposeful conduct. The subject submitted a proposal to NSF that contained a substantial amount of material that was copied from a published article. The subject explained that he was in the habit of copying text from literature articles verbatim into notes, without including references to what he had copied, and then he later used his notes to prepare his proposals. Thus, in his view, his copying was "unintentional," because when he wrote his proposal, he did not know the source of the

material he copied his notes from. The subject's university found, and NSF agreed, that the subject had exhibited "a reckless disregard for appropriate procedures of scholarship" and had "knowingly and repeatedly [engaged] in a pattern of research note-taking that, given enough time, was inevitably going to produce precisely the situation that arose with his NSF grant proposals."

**Evidence of Intent**

Establishing a subject's level of intent must be accomplished indirectly, because there is no direct means of probing a person's thoughts. One can look to *any facts and circumstances that might aid in the determination of state of mind.* This can include what the subject said and what the subject did and did not do.

The burden of proof must also be kept in mind. Under NSF's misconduct in science regulation, all elements of an allegation of misconduct, including intent, must be proven by a preponderance of the evidence. Under the preponderance standard, the finder of fact must conclude, for each element, that it is more likely than not that the element occurred. We have encountered investigation reports in which a university panel decided it could not find the requisite level of intent because it is impossible to know what someone was thinking. But certainty is not what is required: what is required is that it is more likely than not that the subject acted with the requisite level of intent.

One may infer that a subject is aware of the natural and probable consequences of acts knowingly done or omitted. Such an inference does not, and must not, shift the burden of proof, which is at all times on the party attempting to establish that misconduct occurred.

Some acts that can constitute misconduct in science are of a nature that allows the natural inference that they were done with at least the subject's knowledge because it is extremely unlikely that the act could have been committed unwittingly. For example, it is highly unlikely that two people writing a substantial passage on the same subject would use the exact same words. If it is established that person A wrote a substantial passage in a proposal that was peer reviewed by person B, and the identical passage subsequently appears in a proposal submitted by person B, it is reasonable to infer that person B copied from person A's proposal, thus establishing the *actus reus* of plagiarism. The act of copying directly from a source into one's own document intrinsically requires awareness of that act, thus establishing the *mens rea* of plagiarism. Either of these natural inferences will be rebutted if, for example, the evidence shows that person B wrote the disputed passage before receiving person A's proposal, or that portion of the proposal had been incorporated by person B from a contribution that person B believed in good faith had been written by a member of person B's research group.

The veracity of the subject's proffered explanation of the subject's actions must be thoroughly tested with regard to both the alleged act of misconduct (*actus reus*) and the level of intent *(mens rea).* All witnesses who may be able to corroborate (or not) the subject's story must be interviewed, and pertinent documentary and other physical evidence must be obtained and analyzed. If the subject's explanation is impeached, that fact must be taken into account when assessing the subject's level of intent at the time the misconduct was committed.

Evidence reviewed for assessing level of intent may also include evidence of other acts, including other acts of misconduct in science.

As explained above, a finding of misconduct in science may be based on reckless action. Thus, a subject may be found to have committed misconduct even though the subject did not intend to deceive—if it is determined that the subject acted in a way that was a serious deviation from the way a reasonable person in the circumstances would have acted.

Establishing the level of intent is not easy, but it must be undertaken: an institution dealing with a misconduct case cannot simply decide the task is impossible and decline to make a determination about the level of intent —and thus conclude that no misconduct occurred. As with every other aspect of a case involving alleged misconduct in science, evidence must be gathered and weighed about the state of mind of the subject of the allegation. Decisions about a subject's level of intent must be explained as thoroughly as the other factual determinations in a misconduct case.

OFFICE OF INSPECTOR GENERAL

# Semiannual Report to the Congress

Number 10

October 1, 1993 - March 31, 1994

NATIONAL SCIENCE FOUNDATION

# MISCONDUCT IN SCIENCE

## MISCONDUCT CASES ARISING FROM COLLABORATIVE RELATIONSHIPS

Scientists collaborate to combine their different areas of knowledge and to enhance their individual abilities as researchers. Most collaborations succeed, but when they fail, OIG sometimes receives allegations of misconduct in science. Usually, these concern rights to intellectual property used or developed during the collaboration. In our reviews of several cases handled during this reporting period, we made three important observations.

First, the intellectual property rights of collaborators depend on the nature of the collaboration. At one extreme, are collaborations where clearly separate and independent contributions are "stitched" together. At the other extreme, are collaborations where the individual contributions have become so "fused" that separating them is virtually impossible. Over time, as collaborations progress, the different contributions tend to become more integrated. Collaborations can break down at any stage. Depending on how integrated the components of a collaboration are and at what stage it breaks down, OIG has made different judgments about the intellectual property rights of the collaborators.

Second, the unequal status of collaborators creates opportunities for exploitation, and junior scientists who believe that they have been exploited often raise allegations of misconduct in science. There is much potential gain for junior scientists in collaborative relationships, but also a danger that senior collaborators will unfairly deprive junior colleagues of the credit due them.

Third, there is disagreement about the norms governing collaborative relationships. Some scientists consider actions misconduct in science that others believe are acceptable or, at worst, undesirable. We receive allegations of misconduct based on different interpretations of community norms and we sometimes are unable to do anything about undesirable practices because there is no generally understood standard that they violate.

*The cases discussed below illustrate these observations.*

**NSF's DEFINITION of MISCONDUCT in SCIENCE and ENIGINEERING**

*Fabrication, falsification, plagiarism, or other serious deviation from accepted practices in proposing, carrying out, or reporting results from activities funded by NSF; or retaliation of any kind against a person who reported or provided information about suspected or alleged misconduct and who has not acted in bad faith.*

**Independent Use of Materials Generated in a Failed Collaboration.** Two PIs agreed to collaborate on a proposal. Over a short interval (15 days), they briefly discussed their project and independently developed their separate sections for the proposal; however, 1 day before the submission deadline, the second PI broke off the relationship because of interpersonal differences. The first PI completed the proposal, which retained the second PI's contribution, revised the proposal to reflect the second PI's absence, and submitted it to NSF. The second PI, who did not have a position at her institution that permitted her to submit a federal grant proposal, established a working relationship with a third, more senior PI, who agreed to "front" the proposal for her. Together, they submitted a proposal that contained the second PI's text. Despite the fact that all three PIs were attached to the same department, neither the first nor the second PI knew the other had used the text in question, and neither mentioned the other's contribution in the proposal submitted. An NSF program officer noticed that the two proposals contained a substantial amount of identical text, and this led to an allegation of plagiarism.

The PIs' university investigated the allegation. It found that the materials drafted by the two ex-collaborators were easily separable because their contributions described different fields of study. The first and second PIs both felt they had a right to use the material, the first PI because he had participated in their joint discussions and had thought about the project before his contact with the second PI, and the second because she was the author. The university concluded that the first and second PIs had erred in failing to inform each other of their subsequent use of the material, but that the second PI, being the author of the common material, had less of an obligation to her collaborator than he did to her. While finding that both investigators, to different degrees, had not shown sufficient regard for "professional etiquette and collegiality," the institution did not consider their actions to be misconduct in science. In its evaluation, the investigating committee cited the two PIs' inexperience and their difficulties with English as mitigating factors.

The investigating committee said that if the institution had a solid training and oversight program for its less experienced investigators, this situation might have been avoided. The institution also cautioned the third PI about assuming responsibility for the contents of a document without having carefully reviewed it. OIG concurred with the institution's assessment.

**Independent Use of Collaborative Ideas after a "Fused" Collaboration Has Concluded.** A postdoctoral researcher submitted to another agency a proposal that she jointly developed with a senior colleague at another institution. The two researchers conducted their collaborative experiments at the colleague's laboratory using materials she had brought to the collaboration. The two did not work well together and planned to discontinue the collaboration. Without informing her, the senior colleague subsequently submitted a proposal to NSF using the postdoctoral researcher's materials and the knowledge that he had gained during their collaboration. His submission proposed new, but related, research and named a new collaborator. The postdoctoral researcher alleged that this action constituted intellectual theft, since ideas and materials she had initially brought to their collaboration were now an integral part of his proposed independent work.

We concluded that this was not intellectual theft because each collaborator is entitled to use experimental samples, data, and jointly written materials that were the products of collaborative work in subsequent independent endeavors. We noted that, in this case, the postdoctoral researcher's contribution was appropriately acknowledged. In other cases, however, where researchers have subsequently reused collaboratively developed products, we believe that clearer acknowledgements of these prior efforts might have prevented allegations of misconduct from arising.

**Independent Use of Ideas After a "Stitched" Collaboration Has Concluded.** A scientist excerpted portions of text from an article he wrote and included them in a collaborative proposal that he and a colleague submitted to another government agency. The colleague then reused the text in question years later in a proposal to NSF. A reviewer noticed that four paragraphs of text from the article appeared without attribution in the colleague's NSF proposal. Since the copied material was the original author's own work and had subsequently not been altered by the colleague, we concluded that it was inappropriate for the author's ex-collaborator to reuse the material in the new proposal without explicitly acknowledging its source. We determined that the colleague's actions did not constitute misconduct because the material had appeared in a proposal that was co-authored by the colleague and the original author. We found that the colleague had been careless in reusing the copied material without attribution to the original source document. We requested that he amend his NSF proposal by including a citation to the original source.

**Acknowledging the Role of Junior-Level Collaborators.** A senior researcher submitted a proposal containing material written by a postdoctoral researcher working under his supervision. The proposal named the senior researcher as the sole PI. The senior researcher did not explicitly acknowledge the postdoctoral researcher's contribution to the proposal, but he clearly indicated the postdoctoral researcher as a key collaborator in the research and included his curriculum vitae in the proposal. The senior researcher decided that his collaborator was not sufficiently mature as a scientist to share co-PI responsibilities.

Our informant alleged that, by failing to name the postdoctoral researcher as a co-PI, the senior researcher had depri[illegible]d the postdoctoral researcher of credit for his contribution to the proposal. We concluded that a reasonable scientist reading the proposal would expect that the postdoctoral researcher had helped prepare it and that the senior researcher's action did not constitute misconduct in science. But it appeared that the senior researcher had been less than candid about the responsibilities and status he intended to give his colleague in the project. We believe that collaborators should, at the outset, specify the minimum status each can expect on the project. The norms governing allocations of PI status are sufficiently vague that, in the absence of an explicit promise, we did not believe this was

misconduct in science. But senior scientists who encourage their subordinates to work harder by permitting them to harbor unrealistic hopes about future responsibilities and credit are, at best, engaged in an ethically questionable practice that can lead to allegations of misconduct.

Many of the situations we have encountered could have been avoided if collaborators developed a firm understanding of their rights and responsibilities before they began work on a project. However, in cases where collaborators are substantially unequal in status, explicit agreements might merely formalize unfair allocations of credit. Collaborators do well, at the outset, to make clear their rights to the ideas and data developed during the collaboration and should understand that they are responsible for all aspects of the final product, including data review, experimental design, and written text.

During a recent inspection, we reviewed one institution's policy on conducting research that reflects sensitivity to the ethical issues collaborations can raise. Although we do not believe it is essential to have written policies defining the responsibilities of collaborators, we believe that participants would be well served if they devoted thoughtful time to, and if institutions provided some guidance on, some of the issues outlined above before beginning work on a collaborative project.

## Allegations Involving Data Interpretation and Standards of Practice

We received allegations that a field geologist had fabricated field measurements, misrepresented a locality, and had falsified data while working under an NSF award. Our inquiry, which included the assistance of an outside expert, found that these allegations had no substance.

The complainant assumed that the subject's field measurements had been fabricated when he was unable to confirm them himself. We determined that the complainant had searched a related nearby area, and not the subject's actual field area. Independent confirmation of the subject's original field results was available. This allegation involved differences in interpretation of the geographic extent of a geologic structure.

It was also alleged that in a journal article, the subject had misrepresented the significance of, and excluded a field measurement taken at, an outcrop. We determined that the outcrop was difficult to interpret, and at least three different interpretations were possible including the subject's. Consequently, his exclusion of this measurement from the data he took in the region was within the realm of the subject's professional judgment under the circumstances.

This case underscores that reasonable differences in interpretation of research results are not misconduct in science issues. It also demonstrates that in field geology, unique practices exist that, although different from generally accepted practices of geology as a whole, do not deviate from commonly accepted practices within a smaller subunit of geology. NSF's regulations on misconduct in science allow for differences in accepted practice in different fields and subfields of science.

## Accessibility of Laboratory Notebooks

We received an allegation that a biologist, who was a PI on an NSF award at a northeastern university, had knowingly presented and published data fabricated by his graduate student. At the university's request, we deferred the inquiry and any possible investigation into this allegation to it.

The committee found that the subject permitted all departing students and researchers to take their laboratory notebooks with them and that he had not retained copies of any of that material. The subject stated that he felt the practice of permitting departing personnel to take their laboratory notebooks with them was common in the scientific community. He denied any knowledge of data fabrication by the student. The subject showed the committee data from similar experiments and suggested that the questioned data were not fabricated because

analogous experiments produced similar data. We obtained a copy of data the graduate student had retained and sent it to the university's investigating committee for analysis. The committee concluded that there was no evidence to support the allegations.

We concurred with the institution's conclusion and closed this case without a finding of misconduct. We were, however, concerned about the institution's policy with regard to laboratory notebooks and requested further information. The grantee institution should be able to produce or locate research materials as part of a misconduct inquiry or investigation. The institution reviewed its policy and is currently establishing and promulgating a policy on the retention of materials produced under an NSF award.

## Failure to Provide Access to Data Collected Under an NSF Award

The National Science Board has directed that scientists share "data, samples, physical collections and other supporting materials created or gathered in the course of" NSF-supported research in a timely manner. A PI on an NSF grant had taken data collected on a grant with him when he left the institution for a nonacademic position. A colleague made repeated requests for the data and subsequently enlisted the aid of an NSF program officer to obtain the data. Despite repeated promises to release the data, the PI failed to do so. These data were viewed by the colleague and other members of the scientific community as historically important.

We contacted the PI several times and were assured each time that the data would be released to the colleague. The data were not. We informed the PI that we would begin an investigation into the case because he had broken many promises to share data over the years. This behavior raised questions about the existence of the data. His reluctance raised a concern that some of the data might have been fabricated or falsified and that close scrutiny by other investigators would uncover this problem.

The subject has finally sent the data to a repository where they will be available to interested scientists. We viewed the release of these data as an appropriate resolution of the case. We are committed to upholding the NSB's expectation that scientists will openly share materials and findings collected under NSF awards.

## NSF Action on a Misconduct Case

In Semiannual Report No. 9 (page 26), we discussed a case in which two PIs made false statements to NSF in grant proposals and letters. These false statements exaggerated the extent of the services that their college offered Native American and Hispanic students. The first PI made the original false statements. The second PI used the first PI's false statements as the basis for statements in his own proposal.

We recommended that NSF's Deputy Director find that the two PIs committed misconduct in science. We also recommended a finding of misconduct in science against the college based on the fact that college officials approved the proposals, and the misrepresentations concerned matters within the college's knowledge and control. We do not expect institutions' reviewing officials to assess the technical content of proposals, and institutions ordinarily bear no responsibility if a proposal contains false statements about science or engineering. However, we expect institutions to take responsibility for the truth of statements in proposals that concern matters within the institution's purview, such as the minority programs that those institutions operate. Therefore, we believe the college is partly responsible for the false statements sent to NSF.

The Deputy Director found that the PI who first produced the false statements was guilty of misconduct. When considering what action to take, the Deputy Director noted that the first PI "submitted false statements to NSF in connection with three different NSF grant proposals, clearly demonstrating a pattern of such behavior with obvious

implications for any future proposals. . . ." Accordingly, as we recommended, for 3 years, every proposal the first PI submits to NSF must be accompanied by a written certification that the representations in it involving minority programs are true. For 3 years, the first PI will not be allowed to act as an NSF reviewer, advisor, or consultant.

Although the Deputy Director decided that the second PI incorporated some of the false statements from the first PI's proposals into his own proposal, the Deputy Director concluded that the second PI did so "apparently without realizing their inaccuracy" and therefore his false statements to NSF were not a serious deviation from accepted practices. Although no finding of misconduct was made against the second PI, the Deputy Director cautioned him to "exercise greater care in relying on others as sources of unpublished factual material for grant proposals."

The Deputy Director concluded that it is not unreasonable to expect an institution reviewing grant proposals to take responsibility for the accuracy of background information specifically within the purview of the institution. He agreed the college was less than diligent in reviewing the proposals at issue and that this was a practice he could not condone.

Based on our investigation, the Deputy Director agreed to settle the case against the college without a finding of misconduct in return for the college's agreement to comply with our recommendation. Thus, for 3 years, every proposal submitted to NSF from the college will be accompanied by a certification (sent separately to OIG) that any representations in the proposal involving programs for minority students are true to the best of the signer's knowledge.

OFFICE OF INSPECTOR GENERAL

# Semiannual Report to the Congress

Number 11

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NATIONAL SCIENCE FOUNDATION

# MISCONDUCT IN SCIENCE AND ENGINEERING

## NSF's DEFINITION of MISCONDUCT in SCIENCE and ENGINEERING

Fabrication, falsification, plagiarism, or other serious deviation from accepted practices in proposing, carrying out, or reporting results from activities funded by NSF; or retaliation of any kind against a person who reported or provided information about suspected or alleged misconduct and who has not acted in bad faith.

## SIGNIFICANT MISCONDUCT CASES

### Plagiarism in a Proposal Submitted to NSF

We were informed that a proposal submitted to NSF contained material that was copied without offset or attribution from a Ph.D. dissertation written by a student at another institution. We compared selected pages from the dissertation and the proposal and found that text in the proposal's introduction and background was substantially similar or identical to text in the dissertation. In response to our request for information about the allegation of plagiarism, the subject admitted that he had copied the material from the dissertation. The subject said he might have copied the information because he was familiar with the field and had used similar language in his own publications. He said he could not think of a more concise way of expressing the information. He noted that he referenced publications by the dissertation's author and had changed selected phrases within the copied material to indicate that he had not performed the described work.

We referred this allegation to the institution for investigation. The institution determined that the subject had committed misconduct in science when he plagiarized material from the dissertation in his NSF proposal. However, the institution said it could not impose additional sanctions because the subject had left the institution. Instead it placed the investigation report in his personnel file.

We determined the institution had only assessed the copied material that we had identified. It had neither compared the two documents for further instances of plagiarism nor reviewed the subject's other proposal. We began our own investigation. We learned that the subject had not had the dissertation's author's permission to copy the text into his proposal. We determined that the copied material was not present in another NSF proposal that named the subject as a co-PI and that no further material from the dissertation or other writings by the author appeared in the subject's proposal. We concluded that a preponderance of the evidence showed the subject had committed plagiarism when he copied material from the dissertation without offset or attribution and that his stated reason for incorporating the material into his proposal showed that he had acted with gross negligence.

We forwarded our report to NSF's Deputy Director with a recommendation that she find that the subject had committed misconduct in science and take appropriate actions concerning the subject. We recommended that for 3 years, any proposals the subject submits or on which he is named as a co-PI be accompanied by a certification to our office from the subject that they contain no plagiarism. We also recommended that the subject be responsible for obtaining his department chairperson's or equivalent's assurance that, to the best of their knowledge, the submission does not contain plagiarized material. We believe this case emphasizes the importance of carefully citing and offsetting work copied from a source document irrespective of that document's nature. Information in a dissertation is particularly sensitive because the dissertation may be made available to others before the author has had an opportunity to publish the results.

### Violation of Confidential Peer Review

We were informed that a foreign scientist had submitted a proposal to a foundation in his country that contained text, figures, and formulae copied from an NSF proposal the subject had received for peer review. We could not defer investigation of the allegations to the subject's institution because the subject worked at a foreign institution, which could not reasonably be asked to conduct an investigation that conformed to the requirements of NSF's misconduct in science regulation.

NSF instructs its reviewers not to "copy, quote, or otherwise use material from" a proposal received for peer review. We found that the subject had reviewed the NSF proposal and that his proposal contained a large amount of material that was substantially similar or identical to material in the NSF proposal. The subject had rearranged the presentation of the material in the NSF proposal to suit better the flow of material in his own proposal.

We asked the subject about the allegations of plagiarism and the violation of the confidentiality of peer review. The subject told us that the copied material contained general knowledge in the field and that the ideas in his proposal were not derived from the NSF proposal. He stated that his proposal could stand on its own merits without the copied text. He failed to fully address the significance and extent of the copying. We explained that the content of the copied material was not at issue; rather, the plagiarism allegation centered on his failure to offset the material and provide a citation to the source document.

The subject explained that he viewed proposals as secret documents that were not held to the same rigorous standard of attribution as published works. He said that he had copied other material into his proposal from source documents, including a paper by the PI of the NSF proposal, and had not cited the source documents. Despite our repeated requests, he failed to support his claim that the material he had copied was in common use by providing documents by authors other than the NSF PI that contained the same material.

We concluded that a preponderance of the evidence showed that the subject had knowingly violated the confidentiality of peer review when he copied material from an NSF proposal received for review into his proposal.

We forwarded our investigation report to NSF's Deputy Director and recommended that the subject be found to have committed misconduct in science and that NSF prohibit the subject from serving as a peer reviewer for 5 years. We recommended no additional action to protect NSF from further plagiarism because the subject resides and works in a foreign country and does not submit proposals to NSF. We believe the subject's actions in this case demonstrate the importance reviewers must place on upholding the confidentiality of peer review and that plagiarism of any material, regardless of content, from any part of a proposal submitted to NSF is unacceptable.

**Proposal Seeking Funds for Already Completed Research**

Several reviewers alleged that in a proposal to NSF, a recent Ph.D. recipient misrepresented research that had already been conducted as work that would be done under the NSF award he sought. When we wrote to the subject, he admitted that all of his proposed work had already been performed when he submitted the proposal. He also informed us that he had directed that his collaborator's name be signed on the proposal's certification page without obtaining the collaborator's permission.

We agreed to permit the university to conduct its own investigation. The investigating committee concluded that, although the subject's proposal was "misleading" and "nowhere . . . discuss[ed] research in progress or to be done in the future," the subject intended to use NSF award funds to support new research that was an outgrowth of the work misrepresented as new in his proposal. The university did not find misconduct, but the Provost, in a letter clarifying the university's findings for us, "emphatically" agreed that the subject's action was a serious deviation from accepted practices. Regarding the false signature, the university found that the subject had committed misconduct.

The Provost and other university officials discussed with the subject the seriousness of his acts and warned him that future misconduct would have serious repercussions. The Provost also directed that the subject's department chair "carefully review" the subject's next proposal. The university has also taken steps to ensure that new faculty members learn the ethical requisites of proposal writing and that their senior colleagues play a more active mentoring role.

We believe that the subject committed misconduct both in proposing work that had already been done and in having his colleague's signature put on the proposal without permission. We have recommended that NSF make a finding to that effect. The subject's actions, if tolerated, would subvert NSF's proposal evaluation process, which is predicated on the idea that, in deciding on awards, NSF judges proposed new work. Neither reviewers nor NSF staff members can assess the intrinsic merit of proposed work if investigators misrepresent the work for which they seek funding.

The scientific community respects the integrity of NSF's proposal review process. The subject's disregard for the integrity of this process seriously deviates from accepted practice in his community, and it is therefore appropriate that NSF affirm the community's standards with a finding of misconduct in this case.

However, we believe that several factors mitigate the seriousness of the subject's action in this case.

- There is no evidence that the subject's action was part of a purposeful, coordinated deception.
- The subject took responsibility for his actions when we contacted him and fully cooperated in the inquiry and investigation.
- There is little difference between the research that the subject intended for NSF to support and the research he proposed to NSF.
- The subject's age and inexperience, in the words of the University's Provost, led him not to "associate with this deception the gravity that most others would, particularly experienced researchers."

We also believe that a false signature is an inherently serious matter and warrants a finding of misconduct. In this case, however, we believe its seriousness is mitigated by the fact that the signature did not, and was not intended to, mislead NSF about the role the collaborator would play in executing the research plan.

We recommended that the subject be sent a letter of reprimand. We also recommended that, for 2 years, the subject and the subject's institution be required to certify that any proposals he submits accurately state what parts of the research agenda have and have not been performed. These recommendations are awaiting NSF's action. We believe that these recommended actions adequately protect the integrity of NSF's proposal review process while, at the same time, they permit an inexperienced researcher to put this incident of misconduct behind him and pursue his scientific career.

### Falsification of Data by a Graduate Student

We were informed by the institutional representative of a large eastern university that a graduate student, who was supported by an NSF grant to his thesis advisor, had allegedly falsified data for his Ph.D. research. The institution forwarded the allegation to the graduate honor court according to institutional procedures.

The complainant had observed that a photograph of an analytical result presented by the subject at a professional meeting lacked sufficient clarity. After the meeting, the complainant requested that the subject reanalyze his sample. The results of two subsequent analyses by the subject of the same sample proved different from each other and from the original result presented at the meeting. Additional duplicate analyses of other samples by the subject produced contradictory results. Later, the subject told the complainant that he had falsified data for his thesis.

The graduate honor court determined that the allegation should be investigated. At the honor court's investigation hearing, the subject pleaded guilty to falsifying data. The institution accepted the honor court's findings based on the subject's confession, and the subject was permanently dismissed from the institution with a statement on his official transcript that he had been dismissed for a violation of the graduate honor code. We were informed that the editors of the journals to which the subject's falsified data had been submitted had been notified. We learned that the subject, after leaving the institution, had returned to his native country.

We accepted the institution's investigation report, which relied on the graduate honor code procedures. The sanctions imposed by the institution, combined with the fact that the subject had returned to his native country, led us to conclude that it was unlikely that the subject would be in a position to apply for, and receive, NSF funds in the future. Hence, no further action was necessary to protect the use of public funds and we closed this case.

We noted that many institutions have similar graduate honor code policies and procedures. In this case, the subject admitted his guilt and therefore the adjudication was straightforward. Institutions with similar procedures may encounter more complex investigations if the subject does not admit his or her guilt. It is especially important for institutions to determine how the use of a graduate honor court fits in with the policies and procedures for handling allegations of misconduct in science and engineering established by NSF's regulation (45 C.F.R. §689). In particular, good records of matters involving misconduct in science should be kept, and NSF should be notified when the investigation stage is reached.

### Failure to Disclose Financial Conflict of Interest

We learned that although a postdoctoral fellowship application submitted to NSF contained the required recommendation from the applicant's dissertation advisor, the materials the advisor submitted did not disclose that the advisor and applicant were married. As such, the advisor stood to gain financially from any possible award, yet he did not disclose this financial conflict of interest. The NSF program officer expected that questions on the recommendation form would have prompted the disclosure of such information.

Both the applicant and the advisor told us that they thought this information had been disclosed in the application. The applicant said that this was the second of four fellowship applications that had been submitted; the other three were sent to another NSF program office, another federal agency, and a private foundation, respectively. The advisor had submitted recommendations supporting each application. We obtained records for two of the other applications, including the other NSF application, that showed that he had fully disclosed his marriage to the applicant.

The advisor said that he thought that, unlike the requirements for the other NSF application, for the application in question he had to provide information on the form accompanying the program announcement. Therefore, space constraints dictated that he edit and abbreviate the information he had previously supplied for the other NSF application, and he inadvertently deleted the disclosure of their marriage. The information in the proposal jacket confirmed that the recommendation form in this application contained edited information that on the other NSF application, appeared on sheets attached to the recommendation form.

We could find no basis for the thesis advisor's impression that he was to put the information on the recommendation form for one NSF application but not for the other. However, since both applications were for fellowships of approximately the same amount, there was no reason to believe the advisor would have intentionally disclosed his relationship in the first application yet omit it from the second.

We concluded that there was reasonable evidence to support the subject's statement that the lack of disclosure was inadvertent. At our request, the advisor submitted a disclosure letter to the program office. We closed this case because there was insufficient basis for pursuing this matter. This case illustrates the importance of paying careful attention to financial disclosure when submitting information supporting another PI's proposal. On June 28, 1994, NSF issued an investigator financial disclosure policy and revised award conditions that require institutions to "maintain written and enforced policies" (see discussion in Legal on page 40).

### Consulting Relationships With SBIR Proposals

We closed two cases this period that involved allegations of plagiarism in SBIR proposals. These cases differed from those failed collaborations discussed in Semiannual Report Number 10 (pages 27 through 30) in that these cases involved scientists from academia who had collaborated with PIs from small businesses in preparing SBIR proposals. The academic scientists had expected to be consultants on any awards resulting from the submitted proposals, but they were not. A formal consulting agreement had not been executed before the scientists provided materials that were included in the proposals.

In the first case, we were informed that an academic scientist had written most of the subject's SBIR proposal. Conversations between the subject and the scientist had led the scientist to believe that he would be a consultant on the project if an award was made. It was alleged that the scientist's contribution to the proposal had not been acknowledged, and that the subject as PI had failed to cite a few lines of text that were copied from a manuscript of a paper by the scientist.

In communications with the subject, we learned that he incorrectly believed that a proposal did not have to conform to the rigorous standards of scholarship expected of published papers when citing the sources of information. We corrected his impression and, at our suggestion, he submitted an amendment to his award jacket that acknowledged the scientist's contributions to the proposal, cited the material copied from the scientist's manuscript, and corrected numerous other citation errors. We determined that the scientist's and the subject's discussions had not resulted in a formal consulting agreement, and that a disagreement developed late in the collaboration when the subject discovered that the scientist had a consulting relationship with one of the subject's competitors. [illegible] out a formal consulting agreement, the subject was not obligated to name the scientist as a consultant; however, he should have acknowledged the scientist's contributions to the proposal and cited the material taken from his manuscript. We concluded that although the subject did not act professionally, there was insufficient evidence to pursue a finding of misconduct in science.

In the second case, we were informed that a scientist had assisted with the preparation of, and served as a paid consultant on, an SBIR Phase I award designed to assess the feasibility of the research project. At the subject's request, the scientist sent him ideas for an SBIR Phase II proposal, which, if awarded, would have supported the research effort on the project. It was alleged that the scientist's ideas appeared in the subject's Phase II proposal; however, the scientist was not listed again as a consultant. We determined that the general ideas submitted by the scientist that appeared in the Phase II proposal were not unique. Although the scientist had assumed that the consultancy role would continue in any Phase II award, the subject as PI was under no obligation to do this. The PI was free to identify those who would most appropriately serve as consultants on this phase of the project. The subject was not obliged to continue their collaborative relationship simply because the research was a continuation of their earlier collaborative work. Hence, this case was closed because there was no substance to the allegation.

These cases illustrate how allegations of misconduct can arise from poor communications and a lack of consideration between collaborators. As with any collaborative effort, the problems discussed here might have been avoided if the principals had formalized their working relationship in advance.

**Table 3: Misconduct Case Activity**

| | FY 1994 First Half | FY 1994 Last Half |
|---|---|---|
| Active Cases From Prior Period | 87 | 80 |
| Received During Period | 27 | 20 |
| Closed Out During Period | 34 | 20 |
| In-Process at End of Period | 80 | 80 |

**Outreach Activities**

In addition to their work on misconduct in science cases and on inspections, the Office of Oversight's science and engineering staff published two papers and made presentations at three professional meetings. *NSF's Definition of Misconduct in Science*, appeared in the Centennial Review, XXXVIII, No. 2, spring 1994, pp. 273-296, published by Michigan State University. *Approaches to Misconduct in Science: An Introduction* appeared in Accountability to Research, 3, No. 4, pp. 1-6 (1993). The Oversight staff also made three poster presentations at the Convocation on Scientific Conduct sponsored by the National Academy of Sciences, the National Academy of Engineering, and the Institute of Medicine in June 1994; a presentation to the Department of Health and Human Service's Commission on Research Integrity in July 1994; and a presentation at the Division of Chemistry and the Law at the 208th National Meeting of the American Chemical Society in August 1994.

# Semiannual Report to the Congress

## Number 12

## October 1, 1994 - March 31, 1995

# MISCONDUCT IN SCIENCE AND ENGINEERING

## NSF AND UNIVERSITIES: INDEPENDENCE AND PARTNERSHIP

NSF's misconduct in science regulation affirms that "awardee institutions bear primary responsibility for prevention and detection of misconduct" (45 C.F.R. § 689.3 (a)). Awardee institutions are routinely called upon to protect the integrity of science, engineering, and education activities in which NSF is involved, and most of them have internal regulations that serve this purpose. At the same time, NSF has its own independent responsibility, which it cannot delegate to awardees, for dealing with misconduct in science in connection activities it funds.

When we deal with awardee universities in connection with misconduct cases, we try to achieve a cooperative partnership that does not compromise either partner's independence. We have observed that awardees do not always fully understand our relationship and may feel that an investigation is a task we give them to perform according to our specifications. It would benefit both partners if there were a better understanding of the cooperation and independence that the proper handling of these cases requires. In particular, everyone should understand that both partners can take their own actions when the case is concluded. In some instances, the partners will legitimately take different actions.

Active cooperation on a case usually begins when either we or an awardee has conducted an inquiry and has determined that an allegation of misconduct requires investigation. If the awardee has conducted the inquiry, it informs us that it is about to begin an investigation. If we conducted the inquiry, we usually inform the subject's institution, which may ask us to delay our investigation while it does its own. We prefer that, whenever feasible, awardees conduct their own investigations of allegations directed at their faculty members or students.

When the awardee university begins an investigation, we provide guidance about what would make the investigation adequate for our purposes. The university is not our agent or our subordinate and is not required to follow our guidance. It must comply with its own standards for conducting investigations. However, we hope that the university's investigation will provide the information we need so we do not have to conduct a separate investigation.

When a university completes its investigation and adjudication of a case, it sends us an investigation report. We review the report, and we often go back to the university with questions that give it the opportunity to clarify its report or to collect evidence relevant to our questions. If we have difficulties with the university's investigation that cannot be resolved, we perform our own investigation.

The purpose of our review is not to approve or disapprove of the university's way of conducting investigations, but to decide whether we can use the university's investigation in place of one we would do ourselves. Similarly, we want to know what action the institution took regarding a case to decide whether that action is sufficient to protect public funds in the future or

whether NSF needs to take additional action. When the university has completed its investigation and adjudication, its action is final, and NSF has no authority to overturn it. On the other hand, NSF has the authority to take an action of its own that is independent of the university's action.

If we wish to recommend a finding of misconduct and an action by NSF, we write a report explaining our conclusions and recommendations to NSF's Deputy Director, and she adjudicates the case. In her adjudications, she reaches her own decisions about the facts and applies the standards in NSF's regulation on misconduct in science, not the university's standards. As a result, the Deputy Director may sometimes make a finding of misconduct where the university did not, or she may not find misconduct even though the university did. There are numerous reasons why a university and NSF might reach different conclusions about a case. For example, they may have different definitions of misconduct, standards of proof, assessments of evidence, or views about the role of intent in misconduct findings. Where a university and NSF agree that a subject has committed misconduct, they may not agree as to the actions that should be taken. It is entirely appropriate for NSF and the university to exercise independent judgment and arrive at different conclusions.

NSF makes adjudications of misconduct cases involving NSF proposals and awards because, in the final analysis, NSF has its own responsibility for protecting federal funds by upholding ethical standards in NSF's proposal and award processes. This responsibility is parallel to, but independent of, the university's responsibility. We try to cooperate with awardee institutions and the scientific community to achieve our shared goals and meet our independent responsibilities.

## NSF's DEFINITION OF MISCONDUCT IN SCIENCE AND ENGINEERING

Fabrication, falsification, plagiarism, or other serious deviation from accepted practices in proposing, carrying out, or reporting results from activities funded by NSF; or retaliation of any kind against a person who reported or provided information about suspected or alleged misconduct and who has not acted in bad faith.

## SIGNIFICANT NEW CASES

### OIG Accepts University Assessment of Seriousness

A review panel member alleged that a researcher included in an NSF proposal a paragraph describing a laboratory procedure that was practically identical to a paragraph in a published article written by another scientist. Further inquiry revealed two additional instances in which the subject had incorporated this paragraph into proposals without proper citation.

We determined that an investigation was warranted, and the subject's university conducted it. The university's investigating committee decided that the subject had not committed misconduct in science. It based its conclusion on its assessment of the subject's intent. However, the evidence indicated that the subject copied the material knowingly. We concluded that the subject's intent would not preclude a finding of misconduct. We were uncertain, however, whether what the subject did was sufficiently serious to be considered "a serious deviation from accepted practices" and hence to be misconduct as NSF defines it.

We asked the university whether it believed the subject's act, if done knowingly, would be misconduct in science. The dean replied that, in view of the total set of circumstances surrounding the act, the university did not view it as misconduct. In this case, several factors, no one of which alone would disqualify an act from being misconduct, mitigated the seriousness of what the subject did. Among these were the following facts.

- The copied paragraph occurred in proposals in which the article was frequently cited.
- The subject made clear the source of the ideas. The only originality of the passage that the subject copied lay in its original combination of words.
- The passage itself was only one paragraph long.
- The subject was an inexperienced investigator with a limited command of the English language who had been trained in another country.

The dean of the university sent the subject a letter stressing the importance of appropriate citation and quotation, and the chair of the investigating committee spoke to the subject about this matter. We concluded that the subject's university officially recognized the inappropriateness of what the subject did and took suitable action. The university found that the behavior, though inappropriate, did not rise to the level of misconduct in science. This case illustrates that, where the seriousness of a clearly inappropriate act is in question, we give great weight to the university's assessment of whether, in its local ethical environment, the act was considered serious enough to be misconduct.

## TABLE 3: MISCONDUCT CASE ACTIVITY

| | FY 1994 Last Half | FY 1995 First Half |
|---|---|---|
| Active Cases From Prior Period | 80 | 80 |
| Received During Period | 20 | 27 |
| Closed Out During Period | 20 | 26 |
| In-Process at End of Period | 80 | 81 |

## NEW CASES INVOLVING REPORTS TO DEPUTY DIRECTOR

### Plagiarism in Three Proposals Submitted to NSF

We were informed that officials from a southern institution were conducting an inquiry into possible plagiarism in a proposal submitted to NSF. At the end of the inquiry, rather than conducting an investigation, the officials informed the subject that he could either submit the matter to a faculty committee, resign, or acknowledge unauthorized use of material. The subject acknowledged unauthorized use of material and apologized to the source proposal's co-PI. Thereafter, the subject was denied tenure and left the institution.

Based on the institution's inquiry, we found that there was sufficient substance to the allegation of misconduct to warrant an investigation to determine how the subject obtained the source material and the extent of his culpability. Ordinarily, we defer such investigations to the institution. However, because the subject was no longer affiliated with the institution, we conducted our own investigation.

We determined that material from the source proposal had been incorporated into three NSF proposals for which the subject was the PI. In 2 proposals, 69 lines were identical to those in the source or had many words in common; in the third, 109 lines had identical or substantially similar wording.

We concluded that this was a significant case of plagiarism because the text copied was extensive and described the overall rationale of a student training program, which was central to the review and evaluation of the proposals. Moreover, the subject engaged in a pattern of plagiarism by copying text into three different proposals. The subject further impaired his credibility and responsibility by developing different and contradictory explanations as to how the material became incorporated in his proposals.

We forwarded our report to NSF's Deputy Director with a recommendation that she find that the subject had committed misconduct in science. We recommended that NSF debar the subject from receiving funds from any federal agency for 1 year. We also recommended that NSF inform the subject's new institution that the subject has been debarred so that the institution can comply with the debarment certification on the cover sheet on any proposals the subject submits to NSF.

The institution had a misconduct policy that required an investigation if the charges were not dismissed after the inquiry, but the institution conducted no investigation. This case illustrates why it is important for institutions to handle allegations of misconduct in accordance with their institutional policies. In doing so, they can fully address the issues and bring the matter to closure so that the subject does not face proceedings after moving to a new institution.

## Finding of Misconduct Without Intent to Deceive

A PI submitted a proposal that contained several paragraphs in its literature review that were identical or substantially similar to material in an article published by two other scientists. He told us that when he submitted the proposal, he believed the grammatical changes he made in the original text rendered the use of quotation marks inappropriate, and that he "may have erred by using parts of sentences verbatim without proper citation."

We referred this case to the subject's university for investigation. The university found that the subject had committed plagiarism and reprimanded him. It required that for 2 years, whenever the subject submits manuscripts for publication or proposals for funding, he certify to university officials that he has properly cited his source materials.

The university's investigating committee noted that when the subject submitted the proposal he "did not appreciate that he was making a mistake" and was not aware of "what constitutes plagiarism in this context." The university concluded that these facts did not preclude a finding of misconduct. We agreed with this conclusion. In our report to the Deputy Director, we explained that a senior scientist, such as the subject, who believes that he does not need to indicate that his NSF proposal incorporates the words of a published article is grossly negligent. He has failed to acquire knowledge that is central to an essential competence of his community, i.e., knowledge of how to credit the work of other scientists and avoid misappropriating credit for himself. We concluded that NSF should not excuse plagiarism that stemmed from this failure, even if the subject did not knowingly intend to deceive.

We recommended that NSF make a finding of misconduct and reprimand the subject. We did not recommend that NSF take additional action because we believed the subject's university had acted responsibly and, in imposing its own certification requirement, had adequately protected NSF's interest in maintaining the integrity of its proposal and award processes. NSF agreed with our recommendations. It found that the subject's act was plagiarism "regardless of whether [he] realized at the time that citations should have been provided," and it sent the subject a letter of reprimand.

This case illustrates why a finding of misconduct should not require proof of an intent to deceive. The case also illustrates the successful partnership between OIG and a grantee university in handling an allegation of misconduct. When we informed the university of the allegation, it investigated competently and acted judiciously to resolve the matter. Such responsible action is a model for handling misconduct cases.

## Misrepresentations of Publications in Proposals Submitted to NSF

We were informed by an institution that it had concluded an inquiry into allegations that the subject had misrepresented the status of his scientific research publications in a variety of documents, including proposals to NSF, and that it was beginning an investigation into these allegations. The institution subsequently provided us with its investigation report, its finding of misconduct in science, and a copy of its letter of censure to the subject. We found that we required additional information for our evaluation of these allegations and initiated our own investigation.

We determined that the subject had misrepresented his research productivity. He stated that he had submitted three manuscripts to scientific journals when they actually were only drafts or partial drafts. These misrepresentations appeared in seven proposals variously submitted to the institution, NSF, another federal agency, and a private foundation. We found these misrepresentations in many of the submitted curricula vitae, bibliographies, and prior support statements accompanying these proposals. We also found misrepresentations in materials submitted for two annual reviews at the institution, in a departmental brochure, and in a final report submitted to a state funding agency. We found a total of 40 misrepresentations, of which 13 appeared in NSF proposals. One of the NSF proposals became a large multiyear award.

The subject told us that he had not intentionally tried to deceive anyone and characterized his misrepresentations as administratively careless. He said he made the false statements because proposal evaluation takes so long and he fully expected to submit the manuscripts to the journals shortly after he had submitted the documents containing the false statements. He said that such misrepresentations were common practice within his scientific community. We found that, among other things, the subject had made false representations about the status of his manuscripts in several documents that did not have long lead times associated with their review. Hence, we did not find the subject's explanation credible.

The institution's investigating committee concluded that the institution's personnel committee's intense pressure on the subject to publish papers and obtain funding motivated his actions. After reviewing the chronology and content of the personnel reviews, we agreed with the committee's assessment.

We concluded that a preponderance of the evidence showed that the subject willfully misrepresented the status of his manuscripts and successfully deceived reviewers, program managers, and institutional officials into thinking he was more successful than he really was. It is not a common practice in the subject's scientific community, or the broader scientific community, to present false information to federal agencies. The presence of these misrepresentations in so many places, and over a period of 13 months, demonstrated a broad pattern of behavior.

We forwarded our report to NSF's Deputy Director with a recommendation that she find that the subject had committed misconduct in science. We also recommended that for 5 years, any proposals the subject submits, or on which he is named as a co-PI, be accompanied by a certification to our office from the subject that they contain nothing that violates NSF's misconduct in science regulation. We also recommended that the subject obtain, and send to our office,

his department chairperson's assurance that, to the best of that person's knowledge, the submission does not contain any false representations about the status of manuscripts. These recommendations are awaiting NSF's action.

**Misrepresentation of Credentials**

A computer research company informed us that a PI in its employment submitted proposals on two occasions to NSF that misrepresented his credentials. The proposals, which involved providing network services, included a resume claiming that the subject had earned a B.S. degree in biology, when, as our investigation confirmed, he had not. After the company learned of the subject's misrepresentation, it took steps to terminate the subject's employment, and he resigned from his position.

In response to the subject's misconduct and to emphasize the importance that NSF places on truthful representations in proposals and other documents submitted to NSF, we recommended that NSF's Deputy Director make a finding of misconduct and that the subject be sent a letter of reprimand. We also recommended that for a period of 1 year, the subject be required, when he submits proposals to NSF, to certify to OIG that all information in his proposals is correct to the best of his knowledge. Because the subject had already lost his long-held job as a direct result of his misrepresentation to NSF, we concluded that more severe actions by NSF were unnecessary.

In this case, the subject's 25 years of experience in working with computers were probably far more relevant in assessing his qualifications for the proposed work than his alleged possession of a B.S. degree in an unrelated scientific discipline. Nonetheless, a misrepresentation need not have been material to NSF's decision about a PI's competence to be considered misconduct. The subject's action seriously violated professional standards for the preparation of proposals, and we believe that NSF needs to reinforce those standards by making a finding of misconduct in this case.

# RESOLUTION OF CASES FROM PREVIOUS SEMIANNUAL REPORTS

### Proposal Seeking Funds for Already Completed Research

In Semiannual Report Number 11 (page 30), we discussed a case in which a scientist submitted a proposal misrepresenting research that had already been completed as work that would be done under the NSF award that he sought. The scientist also directed that his collaborator's name be signed on the proposal's certification page without the collaborator's permission. NSF's Deputy Director concurred with our recommendations in this case. She found that the subject committed misconduct, sent him a letter of reprimand, and required that until January 1, 1997, when the subject submits proposals to NSF, both he and an official of his institution certify to the Assistant Inspector General for Oversight that to the best of their knowledge the proposal accurately states what parts of the research agenda have and have not been performed.

### Plagiarism in a Proposal Submitted to NSF

In Semiannual Report Number 11 (page 28), we discussed a case in which a PI had plagiarized text in his NSF proposal from another scientist's dissertation. As a result of our recommendation NSF's Deputy Director found that the PI had committed misconduct in science and she required that, for the next 3 years, when the subject is the PI or co-PI on an NSF proposal, he submit a certification to our office stating that he has reviewed NSF's misconduct regulations and that the proposal is free of anything that violates those regulations. The Deputy Director also required that the subject submit an assurance from his department chairperson that, to the best of that person's knowledge, the submission does not contain plagiarized material.

### Violation of Confidential Peer Review

In Semiannual Report Number 11 (page 29), we discussed a case in which a foreign scientist had submitted a proposal to a foundation in his country that contained text, figures, and equations plagiarized from an NSF proposal he had received for peer review. We recommended that NSF's Deputy Director find that the reviewer had committed misconduct in science and bar him from serving as an NSF peer reviewer for 5 years. The Deputy Director concluded that, while the reviewer's conduct was inappropriate, she could not concur with our recommendation for a finding of scientific misconduct because the situation was not clearly covered under NSF's scientific misconduct regulations. The Deputy Director directed that ". . . NSF proceed with a clarifying amendment to those regulations that will specifically include activities carried out in the course of review of NSF proposals as one of the areas in which NSF will consider issues of misconduct in science." In an administrative action outside of NSF's misconduct regulation, the subject was sent a letter of reprimand and barred from participating in NSF's peer review system for 5 years.

# *Semiannual Report to the Congress*

*Number 13*
*April 1, 1995 - September 30, 1995*

*Office of Inspector General*

*National Science Foundation*

# MISCONDUCT IN SCIENCE AND ENGINEERING

## NSF's Definition of Misconduct In Science and Engineering

Fabrication, falsification, plagiarism, or other serious deviation from accepted practices in proposing, carrying out, or reporting results from activities funded by NSF; or retaliation of any kind against a person who reported or provided information about suspected or alleged misconduct and who has not acted in bad faith.

## Key Consideration in Applying NSF's Misconduct Regulation

NSF's misconduct regulation contains the phrase "fabrication, falsification, plagiarism, or other serious deviation from accepted practices in proposing, carrying out, or reporting results from activities funded by NSF" (45 C.F.R.§ 689.1(a)(1)). We interpret the regulation as empowering NSF to take action against serious violations of the "common law" of the scientific community, that is, the shared standards that enable communities of scientists to function. Fabrication, falsification, and plagiarism are examples of the kinds of acts that are so serious as to ordinarily constitute misconduct, but comparably serious transgressions of other kinds are also included.

Policy discussions of misconduct have largely neglected the issue of seriousness. Yet, in our view, seriousness is a key consideration in NSF's definition of misconduct. We have recently tried to direct the attention of institutions that perform investigations to this issue, and we are encouraged that some have responded by giving careful thought to seriousness in their investigation reports.

Under NSF's regulation on misconduct in science and engineering, adjudicators must consider the seriousness of an alleged offense at two separate points.

*Threshold Judgment.* Adjudicators must first decide whether the alleged offense was serious as part of determining whether it was a "serious deviation from accepted practices." This is a "threshold judgment" that determines whether an act is misconduct. The question at this point is whether the act crosses the threshold dividing "lesser deviations" from "serious deviations." Violations of the ethical standards of the scientific community that are lesser deviations from accepted practices (that is, that fall short of the threshold of seriousness) are outside the scope of NSF's misconduct regulation.

The threshold judgment of whether an act was a serious deviation from accepted practices includes a threshold judgment about intent. The crux of this judgment is whether the level of intent is sufficiently blameworthy that the act can qualify as a serious deviation and hence misconduct. In Semiannual Report Number 9 (page 36), we discussed how to make this judgment and distinguished different levels of intent and the kinds of blame that can be associated with them.

*Degree Judgment.* After the adjudicators conclude that a scientist has committed misconduct, NSF's regulation directs them to next "consider how serious the misconduct was." This is a "degree of seriousness judgment" of conduct that has passed the threshold. It locates that misconduct on a continuum. On the basis of this degree judgment, adjudicators decide on the appropriate action or sanction. Thoughtful assessments of the degree of seriousness by investigating officials familiar with the scientific community can help NSF decide what to do when a scientist commits misconduct.

If misconduct is found, making the degree judgment about seriousness may involve a fuller consideration of intent than was necessary for the threshold judgment. Our society believes that a naive, thoughtless, or ignorant wrongdoer should be treated less severely than an experienced, calculating, and knowledgeable one. It is appropriate for investigating officials to cite any facts about a person's intent they deem relevant to their degree judgments of seriousness. However, assessing the degree of seriousness involves more than considering intent. In plagiarism cases, for example, we consider the amount of plagiarized material and the originality of the ideas expressed in the copied passages to be relevant to the seriousness of the misconduct.

We have noted two recurrent, interrelated problems in how university investigation reports treat seriousness. First, they sometimes confuse threshold judgments of whether conduct seriously deviates from accepted practices with degree judgments of how far beyond the threshold the conduct falls. This leads them to introduce considerations (for example, regarding the subject's lack of experience) into the threshold judgment that should appropriately be reserved for the degree judgment. Second, when investigating committees believe that a finding of misconduct is not warranted, they sometimes explain their conclusion by making strained arguments about intent instead of forthrightly addressing seriousness.

Consider two cases we reported in previous semiannual reports. In the first, an inexperienced scientist admitted that he had sought funding from NSF by misrepresenting work he had already completed as work he had yet to perform. The university investigating committee concluded that this was not misconduct because the scientist's intent had been to use the funds for new work, although that aim had been "poorly expressed." However, when we sought clarification of the university's conclusions, the Provost stated that the scientist's act seriously deviated from accepted practice at his university, and the scientist knew that he had already conducted the research in question. We concluded, and NSF agreed, that this case passed the misconduct threshold.

The Provost also made a degree judgment about the case. He cited a variety of facts concerning both the act itself and the intent behind it that mitigated the seriousness of the misconduct. We found his degree judgment persuasive, and so did NSF.

We do not believe the investigating committee's factual or ethical conclusions about that case were fundamentally different from our own. We believe the committee's report distorted the factual record and evaded the threshold conclusion that the facts required because the committee wanted to avoid unfairly severe actions against the subject. The Provost, by directly confronting the two necessary judgments about seriousness, did more than the committee to achieve this end as well as uphold and articulate the ethical standards of the scientific community.

In the second case, a scientist repeatedly used the text of a methodological description written by two other researchers without attribution to the source. There was no evidence that the omission of a citation or quotation was inadvertent or accidental, in the sense that a word processing error might be. To the contrary, the scientist admitted that she did not wish to rewrite the description in her own words for fear that, because English was not her native language, she would unintentionally distort the method she planned to employ. Although it was clear that the scientist intended to deceive her readers into thinking that the words were her own, an investigating committee at her university concluded that she had not committed misconduct because she had "no intent to deceive."

In our view, the core issue in this case was not whether the scientist had an intent to deceive. Rather, it was whether the act was a serious violation of community standards. We would have welcomed the committee's thoughtful consideration of what it was about the act itself (that is, the length of the passage, the role of the passage in the proposal, the community's expectations for inexperienced scientists, or some combination of factors) that made it insufficiently serious to be misconduct. Unfortunately, we were left to develop our assessment of the act without much help from the senior scientists acquainted with the ethical environment in which the subject worked.

Making good arguments about these two kinds of seriousness is central to investigating and adjudicating misconduct cases wisely and to articulating the common law of the scientific community. Thinking well about seriousness requires reflecting on the community's ethical standards. There are no formulae for calculating seriousness. Scientists who ask for specific, highly codified rules defining misconduct seem to want standards that can be enforced without judgment. Thus, they seek to omit reference to "vague" terms such as "seriousness" in judging misconduct. In doing so, they unwittingly press for a regime of rules that would not truly reflect the subtlety of the ethical norms actually operative among practicing scientists. We doubt that these rules could be so simple to apply as to prevent poor uses of judgment. We believe it is far preferable to face squarely the necessity for judgments about community standards and to encourage reasoned and responsible exercise of judgment than to pretend that the exercise of judgment can be eliminated from misconduct cases or to covertly exercise judgment in ways that avoid scrutiny. Thoughtful discussions of seriousness, in investigation reports and elsewhere, are a good place to start.

# CASES LEADING TO INVESTIGATIVE REPORTS SENT TO THE OFFICE OF THE DIRECTOR

**Plagiarism and Violating the Confidentiality of Peer Review**

We were informed that a subject had submitted a proposal (proposal 2) that contained considerable text, as well as figures and tables, that was copied from a proposal (proposal 1) that the subject had received for panel review the year before he submitted proposal 2. Proposals 1 and 2 were submitted to the same NSF program office and both were funded. The text that was copied into the subject's proposal retained references to software only available at the firm that submitted proposal 1 and references to figures that were found only in proposal 1.

In response to our inquiry, the subject told us that he was unaware of the copying. He had hired an undergraduate student to work with him on the proposal. The student would draft a section and then he would review it, making editorial corrections. They repeated this process, section by section, for the entire proposal. The subject admitted that he had provided the student with proposal 1 and said that he thought this was standard practice but said the student had copied the material from it into his submission without the subject's knowledge. We considered it highly unlikely that the iterative process he described could have resulted in the verbatim copy of text from proposal 1 that appeared in his proposal. We concluded that there was substance to these allegations and, at the university's request, we deferred our investigation until it completed its own. The university accepted the subject's statement that he had given the NSF proposal to the student who committed the plagiarism. It concluded that the subject had committed misconduct in science when he violated the confidentiality of peer review by giving proposal 1 to the student. After reviewing the university's investigation report, we concluded that an on-site investigation by our office was required.

The subject told us that he hired the student based on a recommendation from another faculty member and gave proposal 1 to the student as a good example of how such a proposal should be written without considering the confidentiality associated with proposals received for peer review. He said he had paid the student from his university research funds and that they began working on the proposal about 6 weeks before the NSF deadline. He claimed only to have written those parts that did not contain copied material and could not explain how the copied material, which constituted the proposed work, had appeared in the proposal. He said he had not noticed the references to the software in the proposed work and blamed the departmental secretary for the references in his proposal to the figures in proposal 1.

The other faculty member denied recommending the student to the subject. According to the university's records, the student was not enrolled when the proposal was written. There were no financial

records or timesheets to show that the student was paid for this work. We contacted the student, who said he had returned to his native country before the PI claimed he began working on the proposal.

The subject had submitted a proposal to the same NSF program office in competition with proposal 1 the year before proposal 2 was submitted. The earlier proposal was declined. The material copied from proposal 1 into proposal 2 was directly responsive to the reviewers' criticisms of this earlier proposal.

We found that the subject was an experienced reviewer for NSF who had participated in 2 review panels and reviewed a total of 35 proposals. We did not find it believable that a senior faculty member who had such extensive reviewer experience and who had submitted several proposals to NSF was unaware of the confidentiality associated with peer review.

We concluded that a preponderance of the evidence showed that the subject had knowingly violated the confidentiality of the peer review process and that he alone had willfully plagiarized from the proposal received for peer review into his own to improve his chances of receiving NSF support. We viewed his actions as more serious because he failed to accept responsibility for them. He attempted to blame a student, who was not in the country when the proposal was written, for the copying and a secretary for his proposal's inappropriate references to figures found only in proposal 1.

We recommended that the Deputy Director conclude that the subject committed misconduct in science, debar him from receiving federal funds for a period of 3 years, and prohibit him from participating in peer review for a period of 5 years. We also recommended that NSF recover the awarded funds from the university.

**Misconduct Finding for Human Subjects Violations**

Three families that had been interviewed under an NSF-funded research project complained to the PI's university that she had not fulfilled her promise to pay them for their participation. When attempts to resolve the complaint were unsuccessful, the PI's department chairman referred the matter to the university for investigation. The university found that the subject had misused funds and equipment, violated requirements for the proper treatment of human subjects, and failed to cooperate with the university's investigations. The university also concluded that there was no evidence that the PI had done the work she had proposed to NSF. The PI moved to another institution before the university's investigations were completed, and therefore the university took no action against her. The university recommended that NSF conduct its own investigation, noting that the PI's failure to cooperate had hindered the university's investigation.

A scientist and an investigator from our office conducted an investigation at the PI's new institution that largely reaffirmed the university's findings. We determined that the PI had failed to respond to requests for information made by her university's

Institutional Review Board for the Protection of Human Subjects (IRB); failed to pay research participants as promised; and, in one instance, failed to obtain school system approval for research involving secondary school students.

We concluded that the PI's failures to comply with regulations for the protection of human subjects, taken together, were a serious deviation from accepted practices and recommended that NSF make a finding of misconduct. The evidence also indicated that the PI's misconduct was part of a pattern of habitual disregard for her obligations under her NSF grant. Instances of this pattern included her decision to use her grant funds without NSF's approval for related studies and not for the research she proposed to NSF, misuse of funds from a bank account reserved for compensating research participants, and failure to secure the return or safekeeping of equipment purchased under the grant that was the property of her university.

NSF accepted our conclusions and recommendations. It found that the PI's human subjects violations were misconduct in science; reprimanded her; and, to protect NSF's interests as well as those of human subjects, imposed special conditions on any awards she receives before January 1, 1998. This case illustrates the usefulness of the federal misconduct regulation in helping IRBs protect human subjects from abuse, in those situations in which the IRB is not able to exert its own authority.

## TABLE 3
## MISCONDUCT CASE ACTIVITY

| | FY 1995 First Half | FY 1995 Last Half |
|---|---|---|
| Active Cases From Prior Period | 80 | 81 |
| Received During Period | 27 | 27 |
| Closed Out During Period | 26 | 32 |
| In-Process at End of Period | 81 | 76 |

**Proposal Submitted to NSF Contains Material Plagiarized From Four Other NSF Proposals**

We received an allegation that portions of a proposal submitted by an assistant professor at an eastern college were plagiarized from a proposal that originated at another institution. The subject's proposal, a request for funding through NSF's Instrumentation and Laboratory Improvement program, was not funded.

Consistent with NSF's position that awardee institutions bear primary responsibility for preventing and detecting misconduct, we informed the college of the allegation so it could further investigate this matter. The subject informed the investigating committee that he had been given two proposals from the other institution. He admitted that he had incorporated 32 lines of introductory material from one of the proposals. However, he claimed that because of time constraints, he had not rewritten the paragraphs in question. The committee concluded that the subject had not intended to plagiarize the material.

We found that the college did not sufficiently investigate how the subject used two proposals in preparing his own. Also, the college uncritically accepted the subject's statement of his lack of intent to plagiarize.

We opened our own investigation and found that, in addition to the introductory material from the first proposal, the subject had extensively plagiarized from the second proposal from the other institution. The subject admitted that he had plagiarized major portions of his proposal, including much of the scientifically substantive portions of the proposal.

Thereafter, the college reopened its investigation and found that in addition to the two source proposals from the other institution, the subject had plagiarized from two proposals that originated from the subject's department at the college. Although the subject copied only short passages of background material from these two departmental proposals, the committee believed that the use of this material was inappropriate because the subject worked on the proposal alone and did not have permission from the authors of the other proposals to copy any material. Moreover, the committee found that 65 percent of the subject's proposal had been copied from the four source proposals. The committee concluded that the subject had committed plagiarism.

We believe the subject's largely verbatim adoption of major substantive portions of two proposals that originated from another institution and lesser portions of two departmental proposals is a serious instance of plagiarism. The evidence, including the subject's description of how he prepared his proposal, supports a finding that he acted knowingly. Therefore, we recommended that NSF make a finding of misconduct, specifically plagiarism; reprimand the subject; and debar him from receiving federal grants for 1 year. We also recommended that NSF prohibit the subject from serving as an NSF reviewer or consultant during his 1-year debarment.

This case illustrates the importance of checking the available evidence for possible misconduct beyond the scope of that initially alleged. It is insufficient to rely on the subject's word that the misconduct is limited to the original allegation. Moreover, this case illustrates wny a finding of misconduct should not require the subject's admission of intent to deceive. Knowing conduct or gross negligence can be inferred from the nature, extent, and repetition of the subject's actions.

**Plagiarism Falsely Attributed to Student**

We received an allegation that a faculty member at a southern university had plagiarized his NSF proposal from an award that another PI had received from another federal agency. Most of the text of the proposal was either substantially similar or identical to the text in the award. We learned that the subject may have received a copy of the award from one of his former students who had worked with the PI on the award because the PI had a practice of providing copies of his funded proposals to members of his research team.

In response to our request for information about the allegation, the subject asserted that another of his former students (the student) had written the proposal. According to the subject, the student was terminated before he completed his graduate degree. After his termination, the student allegedly approached the subject and volunteered to write the proposal for a field of research that interested the subject, but in which the subject was not an expert. The subject maintained that his participation in the preparation of the research proposal was minimal, and that he submitted the proposal as his own with the student's permission.

We referred this allegation to the university for investigation. As a part of its investigation, the university learned from the student that he • knew nothing of the proposal or the award, • was unfamiliar with the field represented by the proposal, • had never been a graduate student at the author's institution, and • was employed in another city at the time the subject said he wrote the proposal. The university determined that the subject committed misconduct in science when he plagiarized almost all of the text from the award and that he misrepresented to NSF that the student had written the proposal. The subject resigned from the university and therefore the university took no further action.

We wrote to the subject to provide him an opportunity to respond to the university's investigation. The subject responded by reiterating his story that he had been "duped" into believing that the student had written the proposal. We contacted the student, who reconfirmed what he had told the university during its investigation: that he had not written the proposal and that he knew nothing about this specific field of science. Our investigation verified that the student's evidence was reliable. We concluded that a preponderance of the evidence showed that the subject had committed plagiarism when he copied, and submitted as his own, the work of another and that he had acted knowingly.

We forwarded our report to NSF's Deputy Director with a recommendation that she find that the subject had committed misconduct in science. We also recommended that NSF send the subject a letter of reprimand and that he be debarred from receiving any government grant support for 3 years. These recommendations are awaiting NSF's action.

**Plagiarism of Proposals Received in Confidence**

We received allegations that two NSF proposals from the same department contained plagiarized material. One person was a co-PI on both proposals, and our inquiry indicated that she was responsible for the alleged plagiarism. In each case, the subject allegedly plagiarized material from proposals that NSF had sent her in confidence for merit review. We deferred our investigation to give the subject's university an opportunity to investigate the allegations.

The university found that the subject committed misconduct. It prohibited her from submitting research proposals of any kind or accepting research support for projects in which she was the sole investigator for 1 year, barred her from engaging in peer review of any kind for 2 years, barred her from receiving support for new graduate students for 1 year, froze her salary for 2 years, reprimanded her, and informed her that it would immediately dismiss her if she engaged in further misconduct.

We recommended that NSF also make a finding of misconduct. We further recommended that NSF reprimand the subject and either debar her from receiving federal grants for one year or enter into a 1-year voluntary exclusion agreement with her. We also recommended that, for 1 year after the debarment or voluntary exclusion ends, NSF require that, when the subject submits a proposal, she • ensure that her department chairperson signs an assurance stating that her proposal does not contain any plagiarized material and • certify in writing that she has recently reviewed the definition of misconduct in NSF's Misconduct in Science and Engineering regulation, that she has not committed misconduct in preparing the proposal, and that the proposal has been reviewed as described above. We recommended that NSF prohibit the subject from serving as a mail or panel reviewer or as a member of a Committee of Visitors for 3 years.

We believe the source of the plagiarized material, the existence of two separate incidents of plagiarism, and the subject's failure to offer a full and frank explanation of these incidents make this a very serious case. In our view, NSF should take strong action against persons who commit misconduct that involves violation of the integrity of its confidential peer review process.

**Misrepresentation of Academic Credentials in NSF Proposal**

An eastern university informed us that it had initiated an investigation into an allegation that a PI had misrepresented his terminal degree in an NSF proposal. The university appointed a committee to investigate the allegation. The committee found that the subject had committed misconduct in science when he claimed to have a Master's degree, which he did not. The university determined that the subject had not received any financial benefit from the award and had successfully completed the proposed work. The subject resigned from the university before the committee completed its investigation. Consequently, the committee recommended no actions in the case.

Our investigation agreed with the committee's conclusion. We considered that the award was not for research, and it did not require that the recipient have a Master's degree. We believe the subject might apply for NSF funds again. We recommended that • the Deputy Director find that the subject committed misconduct in science, • the subject receive a letter of reprimand, and • the subject be required to certify to NSF for 3 years on any proposal he submits as a PI or co-PI that information contained in the proposal is correct. These recommendations are awaiting NSF's action.

# CASES SENT TO THE OFFICE OF THE DIRECTOR IN EARLIER SEMIANNUAL PERIOD

**Plagiarism in Three Proposals Submitted to NSF**

In Semiannual Report Number 12 (page 29), we discussed a case in which a PI had plagiarized from a source proposal into three proposals that he submitted to NSF. The amount of material plagiarized was substantial. The Deputy Director found that the subject committed misconduct and debarred him from receiving federal grant funds for 1 year. She also excluded the subject from participating as an NSF panelist, reviewer, advisor, or consultant during the debarment period. Since the incident of plagiarism, the subject has moved to a new institution. Because debarment is a serious and public sanction, we recommended that the Deputy Director inform the PI's new institution that the sanction had been imposed on an individual currently in its employ. However, the Deputy Director decided that informing the new institution about this PI's misconduct would be an unnecessary and punitive additional sanction and so she declined to take this action.

**Misrepresentations of Publications in Proposals Submitted to NSF**

In Semiannual Report Number 12 (page 31), we discussed a case in which a PI had submitted a proposal that misrepresented the status of several manuscripts as "submitted" when they had not been. Our investigation revealed that the misrepresentations in the NSF proposal were part of a broader pattern of misrepresentation by the subject. The Deputy Director concluded that the subject's false statements to NSF constituted falsification and a serious deviation from accepted practices.

The Deputy Director found that the subject had committed misconduct in science and required that, for the next 3 years, when the subject is named as a PI or co-PI on an NSF proposal, he must certify, and his department chairperson must assure to the best of his or her knowledge, that the proposal does not contain any false statements. This certification and assurance must be made separately and confidentially to the Assistant Inspector General for Oversight.

**Misrepresentation of Credentials**

In Semiannual Report Number 12 (page 32), we discussed the case of a PI who submitted a proposal in which he falsely claimed to have a Bachelor of Science degree. NSF's Deputy Director concurred with our recommendations in this case. She found that the subject committed misconduct and sent him a letter of reprimand. In addition, the Deputy Director required that, until September 1, 1996, the subject, when he submits a proposal to NSF, must certify separately and confidentially to the Assistant Inspector General for Oversight that all the information in the proposal is correct to the best of his knowledge.

# SIGNIFICANT CASES CLOSED IN THIS PERIOD WITH NO INVESTIGATION REPORT TO THE OFFICE OF THE DIRECTOR

**University Finds No Misconduct in Authorship Dispute**

A university informed us that it planned to investigate allegations of misconduct by an NSF-supported PI. The PI had collaborated on a research project with a postdoctoral fellow who had visited her laboratory. The most serious allegation was that the PI, without her collaborator's knowledge or consent, had changed the order in which the authors were listed (and thus the credit each author received) on a paper based on their collaborative research that she submitted for publication. We agreed to defer our own investigation and advised the university that, in cases of alleged misconduct, we were concerned about whether the subject deviated from accepted practice and, if she did, whether the deviation was serious.

Drawing on its own knowledge of the scientific community and the testimony of a senior scientist respected by both the PI and the postdoctoral fellow, the investigating committee concluded that PIs, when submitting papers for publication that report research done exclusively in their laboratories, have broad discretion in deciding the order of authorship. The committee determined that the PI's failure to notify her collaborator or seek the collaborator's approval did not violate a "commonly accepted practice." The university and OIG accepted the committee's judgment and concluded that no misconduct had occurred. However, the committee opined that the subject's actions, though not misconduct in science, fell "below the standard of conduct [the university] should expect of its faculty" because they did not "foster an environment in which its faculty encourage and assist students and post-doctoral fellows in their academic and professional development." The committee recommended that the dean encourage the PI to behave more appropriately.

This case illustrates the role that assessments of seriousness play in misconduct investigations and shows that investigating committees can use such assessments to decide cases. It also illustrates that some actions, though not serious enough to warrant a finding of misconduct by NSF, involve failure to adhere to high ethical standards that should concern officials at the university level.

**Professional Society Conducts Investigation**

The president of a professional society informed us that the society had received an allegation of plagiarism in a proposal that resulted in an NSF award to the society. The society asked that we defer our investigation to permit a committee of academic scientists appointed by the society to investigate the allegation. Because the two PIs on the award were officers of the society, we took special precautions to guard against real or perceived conflicts of interest that could damage the credibility of the society's investigation and make it impossible for us to use the investigation's findings. We routinely examine whether the members of investigating committees have relationships with either the subjects or the complainants that would create a conflict of interest. In this case, we also requested detailed information about the committee members' relationship to the society's governing council and the scientists in the executive office. We concluded that there was no reason to doubt the committee's ability or willingness to conduct an unbiased investigation. As a result, we agreed to defer our own investigation.

The text that was allegedly plagiarized was originally part of an NSF-funded proposal from a PI at a university for a science education project. The project's director wrote a proposal adapted from the PI's original text to apply for renewed NSF funding. The project director supplied the society's PIs with a copy of the renewal proposal and gave them permission to borrow wording from the text of the renewal proposal in preparing their own submission. They treated this as authorization to use verbatim excerpts from the renewal proposal without attribution, which might not have raised a complaint had the project director been a PI on the society's proposal, as the society's PIs had originally planned. However, they changed their plan, with the project director's concurrence, and made him a consultant instead.

The investigating committee found that the society's PIs and the project director should have kept the university's PI better informed about their collaboration and should have cited the source of all passages taken verbatim from the university's renewal proposal. Nonetheless, the society concluded that the actions of the society's PIs did not rise to the level of misconduct, noting that the PIs • clearly indicated in their proposal that their project was based on the university's project, • knew that the project director had informed the university's PI that the society was developing a related project, • had reason to believe they were authorized to use the text in question, and • sought the university PI's support for their NSF proposal when they submitted it and eventually secured a letter of endorsement from him.

The investigating committee reprimanded the PI who wrote the society's proposal for omitting proper citations to the university's proposal. It also said that "it would have been appropriate and courteous" for the PI and her co-PI to have informed the university's PI that they were submitting a related proposal under the auspices of the society before they actually did so. At the committee's suggestion, both of the society's

PIs sent notes of regret to the university's PI. The committee further stated that the project director should have more fully informed his project's PI of his role in the society's project. We accepted the committee's judgment that no one had committed misconduct in science, although we assigned slightly different weight than the committee to the different justifications it gave for this conclusion.

This case is significant because it is the first time we have relied on an investigation performed by a professional society. We agree with the committee that some ethical transgressions occurred that were not serious enough to be misconduct and warrant NSF action, but that should be acknowledged and corrected.

**Intellectual Property Dispute**

A subject submitted a proposal to NSF that contained acknowledgments for two figures, selected scientific data, and reagents to be used if the proposal were funded, to another scientist (the PI) and the PI's collaborator. It was alleged that the PI had neither given the subject permission to reproduce the figures, which he claimed came from his NSF award, nor provided the data or agreed to provide the reagents. The subject said he had received permission from the PI's collaborator to reproduce the figures and the data, and the collaborator had agreed to provide the reagents if the subject's proposal was funded. The subject identified the PI's collaborator as also being his collaborator; however, the collaborator's work with the subject was independent of his work with the PI.

The collaborator confirmed the subject's information. The collaborator said he had asked for, and received, permission from the PI to reproduce the figures in the subject's proposal and had orally relayed that permission to the subject. The collaborator had also provided the data, which were freely available from scientific advertisements and product support literature, and had agreed to provide the reagents to the subject.

We concluded that the subject had appropriately acknowledged the sources of the information in his proposal. The case was reduced to a dispute between the PI and his collaborator about whether the PI had given the collaborator permission to use the information. We recommended to the collaborator and PI that obtaining and giving written permission to use such materials could help avoid such disputes in the future. We concluded that this dispute did not rise to the level of misconduct and closed the case.

**Plagiarism Between Collaborators?**

A subject submitted a proposal that contained a page and a half of introductory text that was copied from another scientist's unpublished manuscript. The introductory text was not indented, and there was no citation to the manuscript. The other scientist's manuscript had been rejected for publication before he showed it to the subject, who then made suggestions on how to improve it. The work described in that manuscript became the basis for a collaboration between the two. The other scientist was responsible for writing the draft of a new manuscript that described the results of their collaboration. He acknowledged that the subject had requested that the introductory text found in the original manuscript appear in the new manuscript. When the subject wrote his proposal, the new manuscript had not been written. However, based on their collaboration, he felt free to use in his proposal material from the rejected manuscript that he expected to be in the new manuscript. At our request, the subject amended his proposal to include a citation to the rejected manuscript and offset the copied text in the proposal.

We were also informed that one of the studies described in the subject's proposal was already completed. The complainant could provide no solid evidence to support the allegation. The subject informed us that he had completed a pilot study, and he considered it preliminary data for the full study described in the proposal.

It was his understanding that NSF encouraged PIs to include discussions of preliminary data in their proposals. We agreed with the subject.

We concluded that the subject's copying text that he presumed would be in a manuscript he was co-authoring and his discussing preliminary data in his proposal were not misconduct in science. We concluded that the two scientists had begun a collaboration that had evolved into a turf battle between the two. In a healthy collaboration, these allegations would not have arisen.

# *Semiannual Report to the Congress*

*Number 14*

*October 1, 1995 - March 31, 1996*

## NSF's Separation of Investigation From Adjudication Endorsed

In November, HHS' Commission on Research Integrity issued its report *Integrity and Misconduct in Research*. This report fulfills the charge the Commission was given to advise the Secretary of HHS on "issues of research misconduct and integrity such as a new definition of misconduct, an assurance process for institutional compliance with DHHS regulations, processes by which to respond to and monitor related administrative processes and regulations, and development of a regulation to protect whistleblowers."

One of the Commission's recommendations is that "The Secretary ensure that the investigation of misconduct and subsequent adjudication are organizationally separated in DHHS, as they are, for example, at the National Science Foundation." This separation of investigation from adjudication in NSF's procedures is explained in a paper published by NSF staff members, "Investigating Misconduct in Science: The National Science Foundation Model," *Journal of Higher Education*, Vol. 65, No. 3 (May/June 1994), pp. 384-400.

The Commission's recommendations are addressed to HHS, rather than NSF. Still, we followed the Commission's deliberations with great interest and are studying its report.

TABLE 3:
MISCONDUCT CASE ACTIVITY

| | FY 1995 Last Half | FY 1996 First Half |
|---|---|---|
| Active Cases From Prior Period | 81 | 76 |
| Received During Period | 27 | 13 |
| Closed Out During Period | 32 | 21 |
| In-Process at End of Period | 76 | 68 |

# MISCONDUCT CASES RESOLVED AS PART OF DEPARTMENT OF JUSTICE FRAUD CASES

## Allegations Against SBIR Firm Lead to Misconduct Conclusion

In the fall of 1992, we received allegations from three separate NSF reviewers about proposals submitted by one firm to NSF's SBIR program. One reviewer alleged that the PI had copied, without attribution, three figures from another scientist's published paper. We found that the text in the proposal discussing the figures did contain citations to papers published by the other scientist; however, only one of these cited the correct paper. The other two figures appeared in different articles that were not cited. We concluded that, while these practices were sloppy, they did not constitute misconduct in science and closed the case in a previous semiannual reporting period.

The second reviewer alleged that a different proposal submitted by the same company contained material plagiarized from a paper published by another research group. We compared the proposal with the paper and ascertained that the company's proposal contained extensive quantities of text, equations, and tables from that paper. Virtually every page of the scientifically substantive portion of the proposal contained some plagiarized material, and a few pages contained little else.

The third reviewer alleged that, in the proposal discussed in the second case, a senior scientist had represented that he had a Ph.D. from a particular academic institution, when in fact he did not. We found that the researcher had attended the institution but had received only a specialization certificate, an intermediate degree between a Bachelor of Science and a Master of Science. We found that the same false representation had been made in the proposal in the first allegation. None of the proposals discussed above was funded.

We considered these matters to be sufficiently serious to conduct our own on-site investigation. That effort was part of a broader fraud investigation, which is discussed in the Investigations section of this report on page 39. The Justice Department's settlement with

the company involved monetary recovery and government-wide debarment and stated that the practices described by the second and third reviewers were serious deviations from accepted practices under NSF's misconduct in science regulation. We closed our cases against the company.

## Criminal and Civil Case Includes Misconduct Activities

We received an allegation that a small company had submitted a proposal containing false statements to NSF's SBIR program. The proposal stated that a university professor had agreed to participate in the proposed research. However, according to the allegation, the professor had made no such agreement and his signature had been forged..

Our investigation revealed other fraudulent misrepresentations in proposals from this company and a related company owned by the same individual, the subject in this case. The case was referred to the Department of Justice for prosecution and was resolved by a felony conviction, a substantial monetary recovery, and government-wide debarment of the companies and individuals involved, as described in the Investigations section of this report on page 35.

By stipulating to these misrepresentations in the company's felony plea and civil settlement, the subject admitted to acts that amount to misconduct in science in addition to criminal and civil fraud. In particular, the subject had promised in NSF proposals that his companies would conduct a certain body of research, though, in fact, postdoctoral researchers and graduate students at two universities had already performed most of that research and submitted it for publication. The subject represented this work as his own when he reported his results to NSF and requested payment. By admitting to these actions, he admitted to intellectual theft of results obtained by others.

# CASES SENT TO THE OFFICE OF THE DIRECTOR FOR ADJUDICATION IN EARLIER SEMIANNUAL PERIOD

At the beginning of this reporting period, the Office of the Director had five cases on which we had recommended a finding of misconduct and which had not yet been adjudicated. In this period, three of these were adjudicated, as described below.

## Plagiarism Falsely Attributed to Student

In Semiannual Report Number 13 (page 35), we discussed the case of a PI who plagiarized his NSF proposal from an award that another PI had received from another federal agency. The subject claimed a former student had been responsible. However, our investigation verified that the student had not been responsible for the plagiarized proposal. We recommended that NSF send the subject a letter of reprimand and debar him from receiving federal funds for a period of 3 years. The Deputy Director concluded that the subject's actions constituted "plagiarism as well as a serious deviation from accepted practices." The Deputy Director sent the subject a letter notifying him of a finding of misconduct in science and of NSF's intent to debar him for a period of 2 years.

## Misrepresentation of Academic Credentials in NSF Proposal

In Semiannual Report Number 13 (page 37), we discussed the case of a PI who submitted a proposal in which he falsely claimed to have a Master's Degree. We recommended that the subject be sent a letter of reprimand and be required to certify, if he served as a PI or co-PI on any NSF proposal over the next 3 years, that he had not misrepresented any information in his proposals. The Deputy Director concluded that the subject's misrepresentation constituted "falsification and is a serious deviation from accepted practices." The Deputy Director sent the subject a letter notifying him of a finding of misconduct in science and of NSF's intent to require that, for 1 year, when he was named as a PI or co-PI on an NSF proposal, he certify that the proposal did not contain any false statements. This certification is to be sent to the Assistant Inspector General for Oversight.

## Plagiarism of Proposals Received in Confidence

In Semiannual Report Number 13 (page 36), we discussed the case of a PI who, in two separate incidents, incorporated material into her own NSF proposals that was plagiarized from proposals that NSF had sent her in confidence for merit review. NSF agreed with our conclusions and recommendations in this case. It found that the subject committed misconduct, and it entered into a voluntary exclusion agreement with the subject that barred her from applying for federal funds for a period of 1 year following the date of her university's final action on the case. It required that, for 1 year after her voluntary exclusion ended, when the subject is PI or co-PI on an NSF proposal, she obtain a signed assurance from her department chair that, to the best of his or her knowledge, the proposal does not contain plagiarized material. It also required that • the subject certify that she recently reviewed NSF's definition of misconduct; • to the best of her knowledge, her proposal is free of misconduct; and • her proposal has been reviewed by her department chair as described above. This certification and assurance must be made separately and confidentially to the Assistant Inspector General for Oversight. NSF also prohibited the subject from serving as a mail or panel reviewer or as a member of a Committee of Visitors until February 1998.

# CASE CLOSED IN THIS PERIOD WITH NO INVESTIGATION REPORT TO THE OFFICE OF THE DIRECTOR

## Institution Investigates Alleged Intellectual Theft

A scientist alleged that another researcher had stolen ideas from a proposal the researcher was sent for confidential peer review. The complainant alleged that the subject's publications repeated an erroneous claim contained in the complainant's proposal and averred that the subject's repetition of this claim was evidence that the subject had used the complainant's proposal as a source of his ideas.

We concluded that an investigation was necessary and informed the institution of this conclusion. The institution informed us that it had already initiated an inquiry into the matter and that the inquiry committee was about to conclude that the allegations lacked substance. The institution stated that, because we had stressed that the complainant's declined proposal was confidential, the subject had felt obliged not to share it with the inquiry committee. We also learned that the inquiry committee, in addition to not examining the complainant's proposal, had not interviewed the complainant.

The institution requested that we delay further investigative activity to permit the institution to complete its consideration of the case. The institution concluded that the subject had not committed misconduct and supplied documentation and reasoning that supported its conclusions. We analyzed the institution's report and the supplemental information that the institution sent in response to questions we raised about the report. We concluded that the report was thorough and objective and that it supported the institution's findings.

However, the history of the institution's handling of the case caused us to have special concerns about whether its ultimate conclusions had been influenced by a predisposition not to find misconduct. We were especially concerned about the institution's apparent readiness to draw conclusions in the absence of necessary evidence and about its initial willingness to permit scientists with a close professional relationship to the subject to play key roles in its examination of the case. We asked a scientist knowledgeable about this area of research but unfamiliar with the investigative

history at OIG and the institution to make an independent assessment of the evidence in the case. The scientist shared the judgment of OIG and the institution that the factual record in no way justified a finding of misconduct.

The institution concluded that the ideas the subject allegedly misappropriated from the complainant's proposal were available in the published literature, and it provided citations substantiating this conclusion. It noted that the timing of the subject's work suggested that developments in the published literature, and not exposure to ideas in the complainant's proposal, were the impetus for the subject's initiation of the research in question. The institution concluded that the subject's data included evidence supporting the subject's interpretation of the data. It therefore determined that the subject's espousal of this interpretation was not evidence that he had repeated the complainant's scientific error and misused the complainant's proposal.

This case illustrates how we work with institutions to ensure that their investigations are sufficiently thorough and unbiased to provide a sound basis for NSF action. By closely scrutinizing the institution's report at the end of the process, we were able to guard against the effects of possible bias at the institutional level without preempting the grantee institution's responsibility as the primary institution for handling misconduct matters.

# Semiannual Report to the Congress

*Number 15*
*April 1, 1996 - September 30, 1996*

*Office of Inspector General*
*National Science Foundation*

# MISCONDUCT IN SCIENCE AND ENGINEERING

## NSF's Safeguards for Properly Resolving Misconduct Allegations

In June, the Department of Health and Human Services' (HHS) Research Integrity Adjudications Panel overturned a finding of misconduct in science by HHS' Office of Research Integrity (ORI) in a highly publicized case (IN THE MATTER OF THEREZA IMANISHI-KARI, PH.D.). Since the Research Integrity Adjudications Panel's decision, there has been much public comment suggesting that HHS needs to reform how it handles misconduct in science cases.

Al... ...gh we play no role in handling cases at HHS, we are often asked whether NSF's handling of misconduct issues needs reform. We continually strive to improve our processes, and we welcome suggestions for improvement. At the same time, we believe NSF already has important safeguards in place that help us handle misconduct cases well. These safeguards mainly involve the processes by which NSF investigates and adjudicates cases. They also involve how we interpret the definition of misconduct in science in NSF's regulation. But we believe the wording of the definition is not by itself a safeguard. NSF's definition enables misconduct cases to be handled in a principled way, but it takes sound procedures and appropriate interpretation to realize its full value.

One safeguard is the separation of investigation and adjudication. At NSF, no single office performs investigations and also makes findings of misconduct: the Office of Inspector General investigates misconduct cases, and an entirely independent official, ordinarily NSF's Deputy Director, takes a fresh look at the evidence, judges whether a finding of misconduct is warranted, and determines whether NSF should take action against the subject. The Deputy Director gets scientific and legal advice from people whose offices were not involved in investigating the case. Neither the Inspector General nor the Deputy Director plays any role in supervising the other. We believe the organizational separation of investigation and adjudication gives our office incentives to develop strong cases that will persuade an impartial outsider and to close cases without recommending a finding of misconduct where the evidence is not persuasive. In addition, we believe this separation helps ensure fairness to accused

scientists by guaranteeing that only an official who has had no role in the investigation can find that they committed misconduct.

Another safeguard is that misconduct inquiries and investigations are conducted confidentially to the maximum extent permitted by law. We routinely decline to comment publicly about whether we have a case, let alone about the evidence we have collected. Our investigative files are protected by the Privacy Act, which minimizes publicity. Our practice avoids involving complainants in our investigative decisions, keeps the identities of affected parties confidential, and avoids the harm that more public investigations do to the reputations of those involved. It also enables us to keep our view of a case flexible and open to new evidence because we are not tempted to pursue a case in a way that will justify a prematurely taken public stance.

Our process ensures fairness to accused scientists by providing them with opportunities to be heard at appropriate stages in the case. We encourage them to offer evidence and explanations from the earliest point at which it is practicable for them to do so, and we permit them to confront and respond to the evidence against them after we have drafted a written report of the case that explains why we are prepared to recommend that NSF find they committed misconduct. In our view, fairness demands that accused scientists have an opportunity to respond to a coherent explanation of the case against them, not that they be asked for piecemeal responses to isolated bits of evidence as a case is developing or allowed to monitor the investigative process.

Another practice that we think facilitates sound case decisions is analyzing cases in writing and subjecting written case analyses to multifaceted review. In our office, the staff scientist who takes the lead in the investigation prepares written analyses at significant points in the investigative process. Written analyses place a premium on careful thought and rational argument. They minimize the influence of emotional reactions on how a case is handled. These analyses are reviewed by scientists and attorneys who have not participated directly in gathering the evidence. Writing and reviewing encourage sober second looks at the evidence in a case. By involving both scientists and attorneys at every stage in the development of misconduct cases, we help ensure that relevant legal and scientific considerations figure into our investigative decisions and that, in the end, recommended findings of misconduct are based on sensitivity to the standards that are

accepted in the scientist's community and strong evidence that those standards have been seriously violated.

Our interpretation of the definition of misconduct in science is also important. For us, the language in our regulation about "serious deviation from accepted practices" is at the core of the definition. Rather than viewing this language as a vague "catch all" clause that gives us undefined and unlimited jurisdiction, we view it as "empowering NSF to take action against serious violations of the 'common law' of the scientific community, that is, the shared standards that enable communities of scientists to function" (Semiannual Report Number 13, page 27). Our interpretation of this language maximizes the congruence between the ethical standards of the scientific community and the regulatory standard against which scientists are judged. In a data falsification case, the idea that misconduct in science is a "serious deviation from accepted practice" focuses the investigation on whether and how the data reports in question seriously violate the standards in the relevant scientific community for truthfulness in how scientists should present their data. Because we focus directly on community standards, we can avoid formal definitions that imperfectly mirror how scientists use terms such as "falsification" and that can acquire a regulatory life of their own, divorced from the scientific community's ethical standards.

We encourage those interested in improving the way misconduct cases are handled to study these and other organizational processes at NSF and elsewhere. We believe close attention to process can lead to improvements in the fairness, rationality, and timeliness with which agencies handle misconduct cases.

## NSF's Definition of Misconduct in Science and Engineering

Fabrication, falsification, plagiarism, or other serious deviation from accepted practices in proposing, carrying out, or reporting results from activities funded by NSF; or retaliation of any kind against a person who reported or provided information about suspected or alleged misconduct and who has not acted in bad faith.

# CASES LEADING TO INVESTIGATIVE REPORTS SENT TO THE OFFICE OF THE DIRECTOR

## Violating the Confidentiality of Peer Review and a Pattern of Plagiarism

We were informed that the subject had submitted an NSF proposal that contained text that was copied from another PI's NSF proposal (the source proposal).

We learned that a researcher in the subject's department had received the source proposal from NSF with a request for confidential merit review. Without obtaining NSF's permission, the researcher shared that proposal with the subject and asked him to review a particular method about which he considered the subject knowledgeable. The subject said the researcher told him the source proposal was confidential, and yet, while the subject had it, he photocopied selected pages. The subject claimed he subsequently copied text from these pages into his own NSF proposal. We identified five sections of text from the source proposal that had been copied into the subject's NSF proposal. We concluded that the subject had to have photocopied the entire confidential source proposal because he wrote his own NSF proposal several months later, and he could not have envisioned what part of it would be relevant to his own NSF proposal that he had not yet written.

When the subject submitted his NSF proposal containing the text plagiarized from the source proposal, he requested that the author of the source proposal not be included as a reviewer of his NSF proposal because he had a "conflict of interest." The author of the source proposal and subject were research competitors, and we concluded that the subject's request was an attempt to prevent the author from detecting the plagiarism.

During our inquiry, we learned that the subject had also submitted a proposal to the National Institutes of Health (NIH) and that it contained two sections of the copied text found in his NSF proposal; but it also contained more copied text. We found that the subject's NSF and NIH proposals and the source proposal were revisions of proposals that had been submitted 1 year earlier to the same agencies. Although these earlier proposals had been declined, the subject's revised NIH proposal and the revised source proposal were funded. We found that the two larger sections of copied text, which appeared in the subject's revised NIH and NSF proposals were directly

responsive to reviewers' criticisms of the subject's earlier proposals.

**The University's Investigation**

After contacting HHS' ORI, we deferred the investigation into this case to the institution. The institution's investigation concluded that the subject had committed misconduct in science. Specifically, it decided that a preponderance of the evidence supported the conclusions that the subject acted knowingly and willfully when he plagiarized text from the NSF source proposal into his own and that he violated the confidentiality of peer review. The subject claimed that he had requested that the author of the source proposal be excluded as a reviewer of his NSF proposal based on department policy. Other members of the department stated that there was no such policy. The institution also concluded that the subject's actions were an isolated incident. It based this conclusion on the subject's statements, on four separate occasions, that he had never plagiarized material in the past.

**OIG's Investigation**

During our review of the university's investigation report and the supporting evidence, we identified an additional section of text the subject had copied from the NSF source proposal into his funded NIH proposal. In response to our questions, the subject admitted that he had also copied sections from an overview article into his earlier declined proposals. The subject identified additional sections of the overview article that he had copied into his earlier proposals. The subject also said that all the remaining material was his alone. However, when we compared the subject's earlier proposals with the overview article, we found additional sections of text that had been copied from the article into these earlier proposals. We found many of the sections

TABLE 3: MISCONDUCT CASE ACTIVITY

| | FY 1996 First Half | FY 1996 Last Half |
|---|---|---|
| Active Cases From Prior Reporting Period | 76 | 68 |
| Received During Period | 13 | 25 |
| Closed Out During Period | 21 | 34 |
| In-Process at End of Period | 68 | 59 |

copied in the subject's earlier proposals in his subsequently submitted revisions. Some of the text in these sections had been edited when the subject revised the earlier proposals.

In all, we concluded that the subject had plagiarized 17 sections of text. We concluded that the subject photocopied the entire NSF source proposal, not, as he claimed, selected pages.

A preponderance of the evidence supported the conclusion that the subject had knowingly plagiarized text into his earlier unfunded proposals from the overview article and that he had willfully plagiarized text into his revised proposals from the NSF source proposal. He knowingly violated the confidentiality of peer review when he ignored the researcher's stipulation that the source proposal was a confidential document and photocopied that proposal for his later use. We concluded that the subject exhibited a pattern of plagiarism in the proposals he submitted to two federal agencies. Each of his four sequentially submitted proposals contained at least one new section of copied text not found in the previous versions. We viewed his actions as more serious because he was not truthful with the investigating committee or with OIG when he claimed he had only copied selected pages from the NSF source proposal and when he claimed, on four separate occasions to the university investigating committee, that he had never plagiarized in the past. We disproved his statement to us about the complete originality of the text in his earlier proposals. Finally, the subject attempted to prevent the original author from reading his NSF proposal by requesting that he not be permitted to review it.

We recommended that the Deputy Director find that the subject committed misconduct in science; debar him from receiving federal funds for 2 years; and prohibit him from participating in NSF's review process for 3 years. We recommended that, for 2 years following the debarment, the subject be required to certify that his proposals contain nothing that violates NSF's misconduct regulation and accompany his certification with an assurance by his chairperson that the proposal contains no plagiarized material and all source documents are properly cited.

## Plagiarism in an NSF Proposal

We received an allegation that the subject, an experienced researcher at a western university, had plagiarized text in his funded NSF proposal from a review article by other scientists. Eleven sections of text, consisting of 44 lines in the proposal, were either identical or substantially similar in wording to the article's text. None of the text was offset or cited to the source document. The subject explained that the text copied from the review article did not contain original ideas, and comparable wording could be found in other publications. We compared the subject's proposal, the review article, and the publications in a reference list provided by the subject. We concluded that the subject's evidence verified that the copied text contained knowledge that was common in the field, but did not support his contention that the wording he used in his proposal could be similarly explained as common in the field.

We referred the allegation to the university for investigation. The investigation committee accepted the subject's explanation that he had written the proposal from notes he had prepared while reading the review article as well as other publications, and this accounted for the similarity in wording. The committee observed that the subject had referenced the article once in the proposal, although not in conjunction with any of the 11 sections of copied text. The committee cited two examples of text that it believed supported the conclusion that other publications contained text comparable to the copied text. However, in the first instance, the committee misquoted part of the text from the two sources it was comparing, and, in the second, the committee cited only a single sentence. When we asked the committee to provide additional convincing examples of comparable text, it cited the subject's original reference list. The committee said it was natural for authors writing about the same ideas to produce text that was similar. The committee concluded that, because the proposal did not contain a single, complete verbatim sentence copied from the article, the subject had not committed plagiarism or misconduct in science.

We regarded the committee's view of plagiarism as too narrow because it did not recognize that close paraphrasing as well as copying many units of text shorter than a sentence is commonly considered plagiarism. The committee accepted the subject's account that he relied on notes he prepared from the article to write his proposal. However, because the subject had discarded his notes, the committee could not substantiate his claim that he used notes to prepare his proposal. The committee did not request other examples of the subject's notes. It could not verify that he actually used notes or, if he did, whether they commonly contained source citations and distinguished between copied or paraphrased text and his own.

We determined that the subject had been less than truthful when he denied that the copied text in his proposal was from the article and when he contended that the identified text was comparable to other published text. We believe the subject seriously deviated from accepted practice when he copied 44 lines of text from the article, including some of the article's organization, into his NSF proposal. We concluded that, even if the subject copied text into his proposal from notes he prepared from the article, as he claimed he did, his action was grossly negligent because he did not check to see whether he was properly acknowledging his sources. However, given the extensive copying of text from the article into the proposal and the similar organization of the material in both documents, we considered it more likely than not that the subject actually copied the text directly from the article into the proposal.

We concluded from the preponderance of the evidence that the subject, an experienced scientist and journal editor, committed plagiarism. We recommended that the Deputy Director find that the subject committed misconduct in science; send him a letter of reprimand; require that he certify to NSF for 2 years that any proposal he submits as a PI or co-PI contains nothing that could be considered misconduct in science; and require that his department chairperson certify that, to the best of his/her knowledge, the proposal contains no plagiarized text.

# CASES SENT TO THE OFFICE OF THE DIRECTOR IN AN EARLIER SEMIANNUAL PERIOD

## Plagiarism and Violation of Confidential Merit Review

In Semiannual Report Number 13 (page 31), we discussed the case of a PI who had plagiarized text and figures from an NSF proposal he had earlier reviewed as a member of an NSF review panel. The subject claimed that a student had plagiarized the material from the proposal without his knowledge. However, we learned that the student was not in the country when the subject's proposal was prepared, and that the subject, alone, prepared it. We recommended that NSF send the subject a letter of reprimand, debar him from receiving federal funds for a period of 3 years, prohibit the subject from serving as a reviewer for NSF for a period of 5 years, and recover the funds ($88,923) awarded to the subject's institution on the basis of the subject's proposal that contained plagiarized material.

The Deputy Director concluded that the subject had committed "severe misconduct in science" and sent him a letter of reprimand. She debarred him from receiving federal funds for 2 years and prohibited him from serving as a reviewer, consultant, or advisor for NSF for 5 years. NSF and the university mutually agreed to cancel the grant resulting from the proposal containing the plagiarized material, with an $88,923 recovery.

## Plagiarism From Four NSF Proposals

In Semiannual Report Number 13 (page 34), we discussed a case in which a subject submitted a proposal to NSF that contained material plagiarized from four other NSF proposals. The amount of material plagiarized was substantial. NSF's Deputy Director concurred with our recommendations in this case. She found that the subject committed plagiarism, and his actions were a serious deviation from accepted practices in the scientific community. She determined that the subject committed misconduct in science; debarred him from receiving federal grant funds for 1 year; and prohibited him from serving NSF as a reviewer, advisor, or consultant during the debarment period.

# CASES CLOSED IN THIS PERIOD WITH NO INVESTIGATION REPORT TO THE OFFICE OF THE DIRECTOR

In this section, we discuss five cases we closed that did not result in recommendations for findings of misconduct, but which, nonetheless, highlight important issues. The first four cases well illustrate how problems arising from poor student-mentor relationships can result in allegations of misconduct in science. Three of these cases also illustrate the importance of timely, well-managed institutional processes for resolving such allegations. The fifth case describes our decision not to readdress a case whose facts had been considered and resolved by another federal agency.

## Deciding Authorship Credit

A university conducted an investigation of three allegations that an NSF-funded professor had misappropriated his graduate students' work by:

- not naming one of his graduate students as a coauthor on a paper that was based extensively on the student's thesis work;
- including himself as a coauthor on a journal publication that was based on a term paper written solely by another of his students; and
- referencing a computer program different from the one actually used to calculate the reported results. The referenced program was written by the professor and a collaborator; the program actually used was written by one of the professor's students.

The university committee concluded that the action involved in the second allegation was within the accepted practices of the community, and that, in the other two allegations, the professor's actions deviated from accepted practices, but they did not rise to the level of misconduct.

We asked the Chancellor to clarify why, in light of the facts presented by its investigative panel, the university believed the professor's deviations from accepted practices were not serious. The Chancellor replied that he personally disagreed with some of the panel's conclusions, but that as an official of the university, he did not wish to overturn the panel's decision. We requested that the Chancellor reconvene the investigative panel to clarify its reasoning, but he declined to do so. The university's decision left us with no authoritative reasoning from the university and

with the conflicting assessments of the Chancellor and the investigative panel on the seriousness of the professor's deviations from accepted practices. Consequently, we were unable to close this case at this point.

As discussed in Semiannual Report Number 12 (pages 26 and 27), NSF relies on the university to provide a detailed analysis explaining its decisions and actions. However, NSF has the authority to take independent action, if necessary, to protect the integrity of research connected with its funds. We initiated our own investigation and consulted with two experts familiar with research and publication practice within the professor's field.

The two consultants were split on their opinion about whether the professor's actions related to the two unresolved allegations represented serious deviations from accepted practices. We concluded that, under the circumstances, we could not make a case that misconduct in science was demonstrated for any of the allegations, and we subsequently closed this investigation.

Although there was no finding of misconduct in this case, still, the professor's role as a mentor was compromised by his arbitrary assignment of authorship credit. Not only did the students not receive the credit they deserved, but their opportunity to learn what is accepted practice was affected.

## Alleged Intellectual Theft and Sexual Harassment

A graduate student (the complainant) at a large northeastern university alleged that her faculty advisor (the subject) appropriated some of her ideas without acknowledgment on four separate occasions. The ideas appeared in publications and as part of conference presentations. The complainant told us that she had informed the university of her allegations and that it had initiated an inquiry. We referred our inquiry to the university and asked that it provide a copy of its inquiry and any investigation report on completion.

We subsequently learned that the complainant's statement to the university included allegations of sexual harassment against the subject that she linked with the allegations of intellectual theft and with his impeding her research progress. The complainant informed the U.S. Department of Education (DoEd) about the alleged sexual harassment, and she also initiated legal proceedings against the subject and the university. We suspended our review of the

allegations pending resolution of the legal proceedings. Subsequently, we learned that the parties had reached a confidential settlement agreement resolving the issues, and that DoEd on this basis had closed the complainant's case. We requested a copy of what the university considered its inquiry report. The report did not adequately address the four allegations of intellectual theft and did not evaluate the allegations of sexual harassment as possibly impeding the complainant's research efforts. At our request, the university initiated an investigation into the allegations of intellectual theft.

The university's investigation committee concluded that the subject had not committed intellectual theft, but its investigation report was incomplete. We requested additional information and on the basis of what we received decided to initiate our own review. Our examination of the four allegations of intellectual theft determined that one had no substance, and another had insufficient substance to pursue. Of the two remaining allegations of intellectual theft, one involved some of the complainant's data that had been published in a paper coauthored by the subject with another scientist, and the other involved some of the complainant's ideas and text that appeared in a conference paper published by the subject. Although the subject had apparently used the complainant's information in both instances, in one case he had not acknowledged her help in the paper. In the other, the subject had provided the complainant with only limited acknowledgment rather than authorship. We observed that the subject used the complainant's work in a manner that was not collegial. We concluded that, although the subject's citation practices did not provide a supportive and positive mentoring environment for the complainant, his actions in this situation did not rise to the level of misconduct in science.

The institution had previously considered the allegations of sexual harassment separately under other existing policies and procedures and had entered into a confidential settlement agreement, which precluded the parties from any future discussion of them. We had received detailed information from the complainant about the allegations of sexual harassment prior to the settlement agreement. We reviewed the complainant's claim that the subject's alleged sexual harassment impeded her research progress. The complainant's detailed description revealed a complex relationship between the complainant and the subject. We were unable to find clear examples of alleged sexual harassment by the

subject that could be linked to his impeding her research progress. We also concluded that the complainant's allegation that the subject's failure to properly acknowledge her research efforts was evidence of sexual harassment was unsupported because both the institution's and our investigations determined that no intellectual theft had occurred.

In this case, because the university had not followed through with an acceptable inquiry into the allegations of misconduct in science as we expected, we were forced to ask the university repeatedly for information and eventually to initiate our own review of these matters to resolve the case. A more timely resolution of this case would nave been possible had the university carried out an adequate inquiry and investigation, as required by NSF's misconduct in science regulation (45 C.F.R. § 689.3), and had fully addressed all allegations.

## Department Chair Issues Inappropriate Ultimatum

A graduate student whose research had been supported by an NSF award to his dissertation advisor complained to his university that the advisor had misappropriated his work. The student also complained to NSF and to a professional society, and he refused to reimburse the university for certain funds he owed it despite having promised to do so. The chair of the student's department instructed the complainant that the university would inquire into his misconduct complaints, but only if he behaved appropriately, kept his promises to the university, and took steps to repair the damage he had caused to his advisor's reputation when he made his allegations widely known.

The student alleged that the advisor had committed misconduct by claiming coauthorship of the student's work. We determined that the advisor had initiated the research in question and secured NSF funding for it. The work was carried out under the advisor's direction and along lines projected in the advisor's NSF proposal. We concluded that, however little the advisor did to execute the project plan, his contribution in developing the plan was such that a claim of coauthorship could not be considered misconduct.

Our inquiry indicated that the student's allegations lacked substance, and we closed the case. After doing so, we wrote to the university administrator who represents the university in its dealings with NSF to inform him that the department chair's action was inappropriate. We explained that awardee institutions must pursue allegations of misconduct regardless of how the informant who raised the allegations behaves. We asked the administrator to inform department heads and other responsible administrators at the university of their obligations in situations such as this.

In our view, the primary purpose of university inquiries and investigations is to safeguard the integrity of research and education at the university, not to serve the interests of complainants. University inquiries and investigations also help maintain the integrity of NSF's proposal and award processes. NSF's misconduct regulation (45 C.F.R. § 689.3) states that "in most instances, NSF will rely on awardee institutions to promptly: (1) Initiate an inquiry into any suspected or alleged misconduct; (2) Conduct a subsequent investigation, if warranted; and (3) Take action necessary to ensure the integrity of research. . . ." It is unacceptable for a university official to undermine our common effort to uphold integrity in science and engineering in an attempt to induce a complainant to improve his behavior.

## No Communication Between Professors and Graduate Student

We received an allegation that a journal paper, published with NSF funds by three professors and a graduate student, contained data that were either fabricated or falsified. The complainant's concern was that these results would distort priorities in an expanding field of research. The complainant knew that a scientist had previously contacted the authors of the journal paper to clarify their calculations. The complainant concluded from the three professors' response that they had not followed the procedure described in their paper.

An NSF program officer agreed with the scientist's analysis. When we asked the professors to explain the alleged discrepancies between the procedure presented in their paper and the procedure described in their response to the scientist, they said they were responsible for designing the scope of the project and writing the manuscript, but that the graduate student was solely responsible for calculating the results. They composed the response to the scientist because the graduate student had transferred to another university

and made himself unavailable to the professors. Their response was consequently based on their interpretation of how they thought the graduate student had calculated the results.

The graduate student explained that when he replied to our letter of inquiry, he first noticed a significant miswording in the paper describing the methodology. He explained how what he did differed from what one might interpret from a reading of the paper because of this miswording. He offered to submit a correction to the editor of the journal that published the original paper. He also informed us that he received no NSF funds; he was supported by a university fellowship.

In several proposals, one of the professors referred to the paper as resulting from prior NSF support. We learned from him that he was describing his *related* research, not strictly research supported by NSF. He told us that the research reported in the paper was completed before he received his NSF award. We concluded that NSF funds had not supported this research and we lacked jurisdiction in this case. We, however, agreed with the graduate student's offer to write a correction and recommended that the professors and graduate student coordinate their response. This case showed how poor communication between coauthors can result in misleading or defective scientific publications. We suggested that a closer working relationship between the professors and their graduate student, which should have included the professors verifying the graduate student's methodology and results, could have prevented allegations of fabrication or falsification. We cautioned one professor that more care should be exercised in the preparation of his proposals.

## Reconsideration of Case Settled by Other Federal Agency Not Warranted

Because of special circumstances outlined below, we decided not to pursue a misconduct in science allegation. The factual basis of the allegation had already been treated and resolved by another federal agency, the DoEd Office of Civil Rights (OCR), as a matter of gender discrimination.

The subject of the allegations was the head of a university-affiliated research facility. The complainants were two female researchers. Among the complainants' allegations of gender discrimination were that the subject had attempted to destroy a female scientist's data and that he had arbitrarily denied a female

scientist access to equipment necessary for her research. We concluded that, depending on the facts of the case and regardless of whether gender discrimination was involved, these alleged actions might prove to be sufficiently serious deviations from accepted practice in the scientific community to constitute misconduct in science. After OCR initiated a gender discrimination investigation, the university and OCR settled the complaint by agreeing that the university would improve its procedures for handling gender discrimination complaints, remove the subject from his position as director of the facility for 3 months, act to protect the interests of women whom the subject had allegedly harmed, and promise that neither the university nor its employees would retaliate against the complainants. The outlines of the settlement were made public. The complainants brought the case to us because they were dissatisfied with the OCR settlement.

We decided that reconsidering the facts in this case would have been warranted only if OCR's resolution left NSF with a significant unresolved interest at stake or if OCR's resolution, however adequate to the alleged gender discrimination, appeared to be grossly inadequate to the seriousness of the alleged misconduct in science. We determined that neither of these conditions was met. The subject's alleged actions did not indicate that he could not be trusted to function as a PI or that some other, comparably compelling NSF interest was at stake. Because the subject suffered a brief suspension from his position as head of the facility and the stigma of a public sanction, we concluded that the results of OCR's action could not be considered grossly inadequate. We concluded that, in the circumstances of this particular case, it would be inequitable for us to put the subject through a second federal proceeding by reconsidering the same factual allegations as possible instances of a different category of wrongdoing.

TABLE 4: ASSURANCES AND CERTIFICATIONS RECEIVED*

| | |
|---|---|
| Number of Cases Requiring Assurances at End of Period | 6 |
| Number of Cases Requiring Certifications at End of Period | 10 |
| Assurances Received During This Period | 2 |
| Certifications Received During This Period | 4 |

* NSF accompanies some findings of misconduct in science with a certification and/or assurance requirement. For a specified period, the subject must confidentially submit to the Assistant Inspector General for Oversight a personal certification and/or institutional assurance that any newly submitted NSF proposal does not contain anything that violates NSF's regulation on misconduct in science and engineering. These certifications and assurances remain in the OIG and are not known to, or available to, NSF program officials.

# Semiannual Report to the Congress

Number 16
October 1, 1996 Through March 31, 1997

# MISCONDUCT IN SCIENCE AND ENGINEERING

## NSF's Definition of Misconduct in Science

In the interest of safeguarding the federal government's vital interest in the integrity of research conducted with government support, the President's Office of Science and Technology Policy (OSTP) has undertaken an assessment of the advisability of uniform procedures for handling allegations of "research misconduct" by all federal agencies that fund science. OSTP sought the views of the National Science Foundation—and in particular the NSB—on a proposal that included a uniform definition of "research misconduct." It was recognized by OSTP and NSF that the construct of "research misconduct" on which the OSTP request was based was narrower than NSF's use of the term "misconduct in science." The NSB and NSF's Director reaffirmed the importance for the agency of the broader coverage of misconduct in science.

NSF's definition of misconduct in science proscribes acts that constitute "fabrication, falsification, plagiarism, or other serious deviation from accepted practices in proposing, carrying out, or reporting results from activities funded by NSF." The core of the definition is the "serious deviation" clause: to constitute misconduct in science, an act must *seriously* deviate from accepted practices in the scientific community. Even an alleged act of fabrication, falsification, or

**NSF'S DEFINITION OF MISCONDUCT IN SCIENCE AND ENGINEERING**

**Fabrication, falsification, plagiarism, or other serious deviation from accepted practices in proposing, carrying out, or reporting results from activities funded by NSF; or retaliation of any kind against a person who reported or provided information about suspected or alleged misconduct and who has not acted in bad faith.**

plagiarism will not be considered to be misconduct in science unless, in a particular case, the act seriously deviates from the ethical norms of the relevant scientific community.

The "serious deviation" clause provides a legal basis for NSF to take action in all cases of serious breaches of scientific ethics pertaining to NSF-funded activities, including cases that cannot be categorized as fabrication, falsification, or plagiarism. Fabrication, falsification, and plagiarism are merely examples of misconduct; the phrase "serious deviation from accepted practices" provides a coherent context for those and other examples of misconduct in science. The clause relies on the standards of the community. As a former chairman of the NSB, the governing body of NSF, stated:

> The phrase . . . "serious deviation from accepted practices" is a significant concession to the scientific community. It essentially invites that community to establish a form of "common law" governing the behavior of its members in the legitimate use of public funds. It would be well for the scientific community to accept that invitation and work on this broader issue rather than endlessly debating the more limited issue.

We recently published *The Constitutionality of the "Other Serious Deviation from Accepted Practices" Clause* in JURIMETRICS, the American Bar Association's Journal of Law, Science and Technology (Vol. 37, winter 1997, pages 149-166). In this article, we point out that comprehensive conduct standards similar to the serious deviation clause are used by many professions and have been uniformly upheld by the courts. For example, teachers and professors—who constitute the majority of the recipients of NSF grant funds—are generally subject to comprehensive community standards of conduct. Teachers can be dismissed for "conduct unbecoming a teacher . . . or other good cause," while professors are subject to sanction for "failure to maintain standards of sound scholarship and competent teaching, or gross neglect . . . ." When assessing a professor's conduct under the latter standard, a federal appellate court concluded that the "academic community's shared professional standards" supplied fair notice of what conduct was prohibited.

In NSF's definition of misconduct in science, the community standard of ethical practices within the scientific profession gives content to the serious deviation clause under specific circumstances. The serious deviation clause, as defined by the scientific community's ethical professional practices, is no less definite than the community standards imposed by other professions and upheld by courts in numerous cases.

The proposed uniform definition would delete the serious deviation clause from the definition of misconduct in science. We believe the proponents of this proposal do not recognize the importance of—or the firm legal basis for relying upon—the practices of the scientific community to establish what constitutes misconduct in science. We believe this proposal should be reassessed based on these considerations.

At the February 1997 meeting of the NSB, the NSB reviewed the experience of NSF in handling misconduct in science matters. Subsequently, the NSB Chairman and NSF's Director stated NSF's preference to maintain, with possible minor modifications, the definitions and processes that have served the agency well over the past decade. NSF also expressed willingness to continue discussions in this area in the interests of a common federal approach.

## CASES LEADING TO INVESTIGATION REPORTS SENT TO THE OFFICE OF THE DIRECTOR

### Plagiarism, Violation of Confidential Merit Review, and Obstruction of Agency Proceedings

A subject who committed a relatively modest instance of plagiarism then rendered his situation far more serious by endeavoring to obstruct our investigation.

We received an allegation that the subject, a university professor, had published a paper that contained material plagiarized from a source document. We referred the allegation to the university for investigation. The university's investigation committee unanimously concluded that the subject had knowingly plagiarized from the source document. We found the university's conclusion to be amply supported by a preponderance of the evidence.

After evaluating the evidence adduced by the university as well as evidence we obtained, we sent the subject a draft investigation report recommending that the subject be found to have committed misconduct in science. Shortly thereafter, the subject presented us with new evidence that he said proved that he had written the text at issue before he obtained the source document. If the evidence were genuine, it would indeed have proven the subject to be innocent. However, we investigated and determined that the new evidence provided by the subject had been faked. The subject ultimately admitted that the evidence was fake, but he claimed that an employee faked it without his knowledge.

Considering all of the evidence, we concluded that the subject was responsible for the employee's preparation of the fake evidence and knew that the new evidence was fake when he submitted it and vouched for its authenticity.

In assessing the subject's state of mind as well as the appropriate NSF action, we considered certain prior acts by the subject. We determined that the subject's prior acts supported the conclusion that he knowingly obstructed the investigation in our case and underscored the need for strong action by NSF. We concluded that the subject's pattern of conduct demonstrated that he lacked the "present responsibility" required for those with whom NSF does business. We recommended that the Deputy Director act decisively to protect federal funds by terminating the subject's current NSF award and debarring him government-wide for 3 years. We also recommended that the Deputy Director work with the university to minimize the effect of these actions on the subject's graduate students and postdoctoral research associates. The Deputy Director is reviewing our recommendations.

## Programmer Falsifies Data

During a university misconduct inquiry, a computer programmer working on an NSF-sponsored project admitted that he had falsified data. Confronted with strong evidence of his misconduct, he confessed that he had designed programs he wrote to alter experimental results and make the results confirm hypotheses that researchers on the project sought to test.

The programmer skillfully hid his misconduct. He wrote and distributed many error free programs for examination and use by members of the research group. At the same time, he falsified data by altering the system software that was part of the routine functioning of the research group's computers. It would have been highly unusual for researchers on the project to examine the system software for errors. By falsifying the data in this way, the programmer expected to prevent the project's researchers from detecting his misconduct.

When the programmer confessed, he took full and sole responsibility for his actions and expressed regret about what he had done. He explained that his falsifications were prompted by a long-standing psychiatric disorder that had caused him to form an irrational commitment to proving one of the research group's hypotheses.

Some researchers had previously raised suspicions about numerous, uncharacteristic errors in the programmer's work. Their suspicions led to an earlier misconduct inquiry that exonerated the programmer. During that inquiry, the programmer lied convincingly to investigators and continued to write programs that falsified data.

After the programmer's confession, the university, acting in accordance with its misconduct procedures, found that the programmer had committed misconduct and terminated his employment. The university then investigated further to verify that the programmer had confessed to the full extent of his falsifications and that he alone was responsible for the misconduct. The PIs and their research group engaged in a series of replication studies to assess the extent of the programmer's falsifications. They sought to determine whether the scientific findings of studies in which the programmer participated were correct. The university appointed a faculty member unaffiliated with the project to monitor the

**TABLE 3:**
**MISCONDUCT CASE ACTIVITY**

| | FY 1996 Last Half | FY 1997 First Half |
|---|---|---|
| Active Cases From Prior Period | 68 | 59 |
| Received During Period | 25 | 22 |
| Closed Out During Period | 34 | 23 |
| In-Process at End of Period | 59 | 58 |
| Cases Forwarded to the Office of the Director During Period | 2 | 2 |
| Cases Held in the Office of the Director More Than 6 Months | 0 | 2* |

* These cases are described in Semiannual Report Number 15, pages 37 through 41.

group's efforts. The monitor concluded that the programmer's confession was generally accurate, though not reliably precise in its details.

From the evidence the university sent us, we concluded that the programmer acted willfully and that his carefully planned deceptions indicated that he knew that he was doing wrong. As an experienced programmer with a strong interest in the substance of the research, he should have been well aware of how offensive data falsification is to the scientific community's ethical standards.

We concluded that this was an unusually serious case of misconduct. The programmer's actions undermined the main purpose for which NSF funds research—to advance scientific knowledge. The programmer's falsifications did not merely alter a few data points or strengthen the case for a hypothesis that was already well supported with genuine data. His falsifications were designed to confirm a previously untested scientific hypothesis. They prompted the research group to draw significant scientific conclusions that the group included in its progress report to NSF and presented at a scientific conference. The misconduct substantially delayed the progress of the research and involved several researchers in months of effort to replicate the group's findings.

We recommended that NSF's Deputy Director find that the programmer committed misconduct in science and seek to enter into a voluntary exclusion agreement with the programmer whereby the programmer excludes himself from employment in federally funded projects for a minimum of 3 years. We recommended that, for 2 years after this period, the programmer agree, before accepting employment on a federally sponsored project, to inform the head of the project and the federal official responsible for it of NSF's misconduct finding and the circumstances surrounding it. We believe this information, by alerting the persons responsible for federal projects to the risks involved in employing the programmer, would enable them to protect the federal interest in preventing misconduct.

# CASES CLOSED IN THIS PERIOD WITH NO INVESTIGATION REPORT TO THE OFFICE OF THE DIRECTOR

In this section, we discuss seven closed cases that did not result in recommendations for action by the Office of Director, but that nevertheless highlight important issues. The first four case descriptions present our resolution of allegations resulting from problematic collaborative relationships between colleagues or between mentors and students. The last three descriptions present our inquiries into cases that raised concerns about NSF's management of particular proposals or awards.

## University Thoughtfully Handles Alleged Obstruction of Research

A PI (the complainant) complained to NSF that a former collaborator (the subject) had "overtly and deliberately" attempted to obstruct the PI's NSF-supported research.

The complainant related two incidents of alleged obstruction, but our inquiry determined that only one of the incidents had sufficient substance to warrant an investigation.

In this incident, the subject allegedly promised the complainant access to a piece of equipment that was necessary for his research; encouraged him, in light of this promise, to use his equipment funds for other project-related expenses; and then unreasonably denied him access to the promised equipment. Because the projects directed by the subject and the complainant shared facilities and equipment at a remote field research site in a foreign country, it was practically impossible for the complainant's project to obtain suitable substitute equipment in a timely fashion.

We referred this allegation to the subject's university and identified for it those questions that we knew an investigation would have to answer to be satisfactory for purposes of NSF action. The committee weighed contradictory evidence and found that the subject had permitted the complainant access to easily reparable equipment and had made him aware of how this equipment could be repaired. It further found that the subject had reason to fear that researchers on the complainant's project might be careless about the needs of the subject's project and might misuse the subject's equipment. The committee decided that the subject's primary responsibilities were to fulfill her research plan and ensure the safety of her employees and equipment.

It concluded that, in a difficult situation, the subject had prudently balanced these responsibilities with her responsibility to cooperate with another scientist. The university concluded that the subject had not committed misconduct, and we accepted its conclusion.

In this case, the investigating committee applied the scientific community's ethical standards governing responsibilities to colleagues in a thoughtful way to an unusual situation. It conducted its investigation in light of our guidance about the issues that an investigation of this case would need to address to be adequate for NSF purposes. The committee's report is evidence that the partnership between NSF and awardee institutions can make self-regulation by representatives of the scientific community work well.

## No Plagiarism by Ex-Collaborator

The complainant notified us of allegations against a scientist who was also a former collaborator (the subject). The complainant alleged that the subject had denied coworkers of authorship credit and submitted proposals to NSF and the National Institutes of Health that contained misrepresentations and plagiarism (including intellectual theft). The complainant also alleged that the university administrators retaliated against him because he made his charges against the subject public.

After discontinuing her collaboration with the complainant, the subject submitted proposals without naming him as a co-PI. The complainant alleged that the subject's actions contributed to the university's subsequent decision to deny him tenure.

A university committee convened to examine his tenure review and his allegations against the subject. It found no evidence to support his allegations that he was unfairly denied tenure or that the subject had committed misconduct in science.

The basis for the complainant's allegations of misrepresentation, falsification, and plagiarism was that data and methodology developed through the subject's and complainant's collaborative effort were jointly owned and could not subsequently be used independently by individual members of the collaborative team. As discussed in Semiannual Report Number 10 (pages 27 through 30), we recognize that the results of collaborative projects can, with the appropriate citation, be used subsequently by all collaborators, either together or individually. In this case, after the complainant's and subject's collaborative relationship ceased, the subject continued to use their joint data and appropriately referenced the source documents. We concluded that the subject's actions were not deviations from accepted practice and would not be considered misconduct in science.

## Citations for Unpublished Information

An NSF program director received an unusual proposal review from the complainant and, concerned about some of the comments in it, brought it to us. The review alleged that the PI of the proposal inappropriately used the unpublished results and methodologies of another researcher. The proposal contained a number of citations referencing "personal communications" with the researcher.

The researcher told us that the PI had contacted him and expressed interest in his research. The PI allegedly informed the researcher that he was interested in a research area different from the researcher's and that the researcher's techniques and material could be useful in the PI's research. The researcher gave the PI his material, unpublished manuscripts, and his graduate student's thesis chapter. The researcher did not stipulate conditions on the use of this information.

The PI said that before he submitted his proposal to NSF, the researcher told him that the manuscripts and thesis chapter had not been published. According to the PI, they agreed that the best way to cite the information was as "personal communications."

We concluded that, because the researcher gave the PI research material, unpublished manuscripts, and a chapter from a graduate student's thesis without conditions on their use, and the PI carefully referenced the information he obtained from the researcher in his proposal, his actions did not constitute a serious deviation from accepted practice and would not be characterized as misconduct in science. We note that if researchers concerned about the future use of sensitive information are asked to share material and unpublished results by a potential collaborator, they should provide a letter indicating what conditions, if any, apply to the use of unpublished information and research material.

## A Poorly Functioning Faculty-Graduate Student Collaboration

We received allegations of misconduct in science against a faculty member at a western university. Allegedly, the faculty member misrepresented the research effort of his former graduate student when he listed himself as first author and the student as second author on a publication that was an edited version of the student's master's thesis. The student was unaware of the publication until after it was published, and the thesis was not cited.

The student said that the faculty member was never satisfied with the thesis drafts he prepared. The student eventually furnished the faculty member with a finished thesis copy and left the institution without providing a forwarding address. The faculty member explained that, although the publication contained text copied from the student's thesis, it also contained some of his own work. He did not cite the thesis because he did not view theses as valid scientific publications; they were not readily available to other scientists and they did not go through the accepted scientific review process. He explained that he

planned the research project, "wrote" most of the thesis, submitted the paper for publication, and did not have any way to contact the student during the publication's preparation.

We sought the advice of an expert in the subject's field of science who concluded that "once stripped of the ill will of the student and the arrogance of the advisor," the matter was not serious. We determined that the student had a responsibility to maintain professional contact with the faculty member. At the same time, the faculty member had the responsibility to notify each named author about a manuscript to be published and to afford each of the coauthors, even a student, the opportunity to participate in the production of the manuscript, including deciding whether documents, such as theses, should be cited. We concluded that the faculty member deviated from accepted practice by failing to cite the student's thesis, but that his action was not a serious deviation and therefore it did not rise to the level of misconduct in science. We suggested that the faculty member consider submitting an appropriate citation correction to the journal editor.

Effective communication in a student-faculty mentoring relationship is important for success. In this case, both the student and the faculty member failed to maintain effective communication, which resulted in troublesome misunderstandings between them.

## Alleged Misrepresentations in a Progress Report

We received a letter alleging that two administrators acted in bad faith when they accepted an NSF continuing grant that included the use of laboratory facilities that they knew would be unavailable to the PIs and that the administrators coerced the project's PIs into submitting an NSF progress report that hid this fact. We received the allegation after the first year's progress report had been submitted to NSF.

Although the PIs' proposal plans included the use of laboratory equipment, they also knew that there would be times when the equipment would (temporarily) not be available to undergraduate students and made allowances for these instances. During the first year, the administrators informed the faculty that the laboratory equipment used to acquire data would be

unavailable to undergraduate students. In the first year's progress report, the PIs wrote that, although it was no longer possible to use the laboratory facilities at the university, this was not a problem because most of the students' critical thinking would involve the analysis, not the acquisition, of data. The PIs' report disclosed that they carefully considered their options and concluded that the original intent of the proposal could still be completed. Thus, NSF's program manager was made fully aware that they no longer had access to the facilities, including the original equipment, and how that would influence their NSF-funded educational activities. The program manager concluded that the loss of the laboratory facilities was not detrimental to the completion of the project and continued to fund the project.

Because the PIs wrote in their progress report that the laboratory was no longer available to them, we concluded that there was no substance to the allegation that they hid this information from NSF. We did not determine whether the PIs had been pressured by their administrators, but concluded that the PIs, dealing with whatever pressure their administrators may have put on them, upheld their partnership with NSF by providing an accurate progress report.

## TABLE 4:
## ASSURANCES AND CERTIFICATIONS RECEIVED*

| | |
|---|---|
| Number of Cases Requiring Assurances at End of Period | 5 |
| Number of Cases Requiring Certifications at End of Period | 7 |
| Assurances Received During this Period | 1 |
| Certifications Received During this Period | 3 |

* NSF accompanies some findings of misconduct in science with a certification and/or assurance requirement. For a specified period, the subject must confidentially submit to the Assistant Inspector General for Oversight a personal certification and/or institutional assurance that any newly submitted NSF proposal does not contain anything that violates NSF's regulation on misconduct in science and engineering. These certifications and assurances remain in OIG and are not known to, or available to, NSF program officials.

## Program Officer Creates Appearance of Impropriety

Two scientists (the complainants) who had submitted unrelated declined proposals to the same NSF program complained to an NSF division director that one of his program officers had improperly handled their proposals. The complainants were concerned that the program officer may have divulged confidential information about their proposed work and improperly suggested to scientists at other institutions that those institutions perform the work the complainants had proposed to NSF. In addition, the complainants alleged that the division had an unarticulated policy that precluded funding proposals such as theirs and that their proposals had not received a fair review. The complainants chose not to ask NSF to reconsider their proposals.

We learned that the program officer (PO) did not divulge confidential information or improperly suggest that one scientist misappropriate another's ideas. However, we concluded that the program officer used poor judgment in two instances. In each instance, the PO made remarks that could be, and were, taken by members of the PO's research community to mean that the PO was suggesting that one scientist perform work for which another scientist was already seeking NSF support. To make such a suggestion would have been a serious breach of the confidentiality with which NSF promises to review proposals and a misappropriation of the ideas in a confidentially submitted proposal.

Although we are convinced that the PO's actions were well motivated, we believe the PO was insufficiently attuned in these instances to the detrimental appearances that well-meaning actions can create. We recommended that the division director send the PO a confidential written message expressing disapproval of the PO's actions, and the division director accepted our recommendation.

This case presented a mixture of possible serious ethical improprieties and alleged poor program management by a program officer. We addressed the possible improprieties in our inquiry. At the same time, insofar as this complaint revealed deficiencies in how well the division articulated and implemented its policies, we treated these as matters best resolved by the division director and other responsible managers in his directorate. This case illustrates some pitfalls that well intentioned program officers can encounter and the need for them to be aware of the appearance that their actions can create.

## Possible Reviewer Conflict of Interests

It came to our attention that an *ad hoc* reviewer submitted a proposal to NSF shortly before he received two proposals from NSF with requests for his reviews. The reviewer's proposal disclosed that the PIs on both proposals were his research collaborators; the PIs' proposals each contained a citation to a paper coauthored with the reviewer. NSF's Proposal Evaluation Form (NSF Form 1) instructs reviewers to disclose any affiliation that might be considered a conflict of interests. In the absence of such disclosure, NSF assumes that the reviewer has no conflicting affiliations. NSF considers collaborative relationships existing within 48 months preceding a requested review to be potentially biasing. Program officers told us that they have disqualified reviewers because of existing or past collaborative relationships. The reviewer did not contact NSF to discuss any possible conflict of interests that he might have with the two PIs after he received their proposals for review.

The reviewer told us that he knew both PIs, but he had no current collaborative relationship with them. He characterized his prior collaboration with them as "limited" and said he had disclosed it in his proposal because, even though the research for the paper was conducted in 1990-1991, the paper was finally published in 1992 (less than 48 months before he submitted his proposal). He said that he did not disclose his past collaborative relationship with the PIs to the NSF program officer along with his review because he did not feel his past affiliation created a conflict of interests, and he felt he could be objective in his review.

It is doubtful that NSF would have considered the relationship described by the reviewer as disqualifying or limiting, and knowledge of it did not influence the program's funding decisions. However, for the merit review process to work as fairly and objectively as possible, it is NSF, not the reviewer, that must determine whether a reviewer's collaborative relationships disqualify or limit any review activities. We told the reviewer that he should have disclosed this relationship to NSF before he submitted his reviews or, at the latest, along with the reviews, and instructed him to disclose relevant collaborative relationships in the future.

## Institutions Need to Review Policies for Responding to Allegations of Student Misconduct in Science and Engineering

In our on-site inspections of NSF-grantee institutions, we always review the institution's Misconduct in Science and Engineering Policies and Procedures (MS&E Policies). We review the MS&E Policies, in part, to determine how cases against students who are alleged to have committed misconduct in science in connection with an NSF-supported activity are handled administratively. In more than 75 percent of our published inspection reports that contain a discussion about how such allegations are handled, we describe concerns that range from the absence of, to the lack of clarity about, student coverage in the grantee's MS&E Policy. In addition, our experiences with cases of alleged student misconduct in science that are processed under institutions' student Academic Misconduct Policies have raised concerns about the timely notification of NSF and the lack of information necessary to evaluate an allegation of misconduct in science (see Semiannual Report Number 11, page 31). These concerns prompted us to conduct a policy review on how allegations of student misconduct in science and engineering are handled.

NSF's Misconduct in Science and Engineering regulation (45 CFR part 689) describes an NSF-grantee partnership for oversight of the ethical practices associated with NSF-supported activities. The partnership places the primary responsibility for preventing and detecting misconduct in science associated with NSF-supported activities with the grantee. As NSF support for science and engineering educational activities increases, a broader group of undergraduate and graduate students is becoming involved. Consequently, for an effective NSF-grantee partnership, policies and procedures at institutions that address misconduct in science issues need to clearly include any student involved in an NSF-supported activity. We reviewed the existing policies and procedures at 11 large, publicly funded institutions to learn how cases involving students alleged to have committed misconduct in science would be handled.

**Misconduct in Science and Engineering Policies and Procedures.** MS&E Policies apply to faculty members and frequently to other staff members at the institutions. Eight of the institutions' MS&E Policies also include "students." Of the remaining three MS&E Policies, one refers only to graduate students and states that they are covered by the student Academic Misconduct Policies; one excludes all students and provides that allegations against them be handled through Academic Misconduct Policies; and one provides insufficient information to judge whether students are included. Five of the eight MS&E Policies that include "students" define misconduct in science to cover research and non-research activities.

**Academic Misconduct Policies.** In contrast to MS&E Policies, Academic Misconduct Policies are exclusively for students. Also, the Academic Misconduct Policies usually define misconduct in broad terms. For example, the Academic Misconduct Policy notes that "The description of prohibited conduct set forth herein shall be interpreted broadly and is not designed to define misconduct in exhaustive terms."

**Student Coverage Under MS&E Policies and Academic Misconduct Policies.** Three of the 11 MS&E Policies refer to the Academic Misconduct Policies to handle alleged misconduct in science by students. The remaining institutions' MS&E Policies and Academic Misconduct Policies are ambiguous about which policy applies to alleged student misconduct for certain allegations where both policies cover students. For example, all the Academic Misconduct Policies and MS&E Policies in this study list plagiarism as an act of misconduct. In practice, an allegation of plagiarism against a student involved in an NSF-supported activity could be pursued under either Policy. In a few instances, this jurisdictional ambiguity is recognized by the institution, and the MS&E Policies include language that directs all student conduct concerns to the official responsible for administering the Academic Misconduct Policies. A comparable statement directing student conduct concerns to the official responsible for overseeing the MS&E Policies when federal support is involved does not appear in any of the Academic Misconduct Policies. At all 11 institutions, separate officials are responsible for

administering the 2 Policies. Because there is no complete "information loop" between the designated officials overseeing the 2 separate Policies at any of the 11 institutions, a misconduct in science allegation against a student that advances to an investigation under the Academic Misconduct Policy and that involves an NSF-supported activity would not necessarily be relayed to the MS&E Policy official.

NSF does not mandate any specific procedure or reporting method for institutions' oversight responsibilities. However, it is important that institutions' Policies include all students who receive or participate in NSF-supported activities and establish a process to notify NSF of any inquiry that leads to an investigation. None of the 11 Academic Misconduct Policies includes a provision for notification of NSF.

Institutions should review their existing MS&E Policies and Academic Misconduct Polices to ensure that, whatever Policy is used, an appropriate procedure is in place to notify NSF of any misconduct in science allegation against a student involved in any NSF-supported activity that advances to the investigation stage. Such a review would help ensure that each institution is upholding its end of the partnership with NSF in its oversight responsibilities of ethical issues.

# Semiannual Report to the Congress

Number 17

April 1, 1997 Through September 30, 1997

Office of Inspector General

National Science Foundation

# OTHER CASES CLOSED IN THIS PERIOD

## University Investigates Alleged Obstruction of Research

A PI complained to her NSF program officer and her university that several members of her department were committing misconduct in science by obstructing her research. Among the PI's allegations was that faculty members in her department were attempting to assert control over equipment the university had agreed to dedicate to the PI's use when the PI joined the university's faculty. The PI needed the equipment for her NSF-supported project.

When the program officer brought the allegation to us, we informed her that she could intervene as necessary to ensure that progress under the PI's award would be satisfactory. However, we cautioned her that, in keeping with NSF policy, she should avoid addressing any misconduct allegations. The program officer indicated that she believed the complainant was making acceptable progress on her award and that no NSF intervention was required to enable the complainant to continue doing so.

The university determined that the PI's complaint had substance, and it initiated an investigation. After considering the facts of the case, the university's investigation committee concluded that "an unacceptable pattern of action based on non-normative understandings of the proper conduct of research ha[d] become common" in the PI's department. The committee recommended "an attempt to restructure the administration" of the department "rather than proceeding to specific charges against specific individuals." However it "le[ft] open the issue of whether disciplinary proceedings should be initiated in the future if the current problems, or similar ones, continue." The committee proposed a 1-year monitoring period, after which, if it was satisfied with the department's progress in resolving its problems, the committee would "recommend dropping the possibility of pursuing formal disciplinary charges." The university adopted the committee's recommendations.

When the monitoring period ended, the university sent us a revised report. It reaffirmed its earlier conclusion that there was no misconduct, and, based on our own analysis of the evidence in the report, we accepted this conclusion.

In closing the case, we told the university that we were pleased that it had recognized that some practices, though not misconduct in science, nonetheless called for forward-looking, corrective action at the university level. We encouraged the university in its effort to develop and disseminate an improved equipment use policy and applauded it for making an effort to help the complainant overcome the disruptions to her research.

This case shows that some deviations from accepted scientific practice are not serious enough to be misconduct in science and are best addressed with future-oriented solutions, rather than by assigning blame. While noting certain ill-judged or inappropriate actions, the university saw this case mainly as an opportunity to improve the climate for research on its campus. This case also shows how we work to separate our investigative activity from NSF's management role in furthering progress on NSF awards.

## TABLE 4
## MISCONDUCT CASE ACTIVITY

| | FY 1997 First Half | FY 1997 Last Half |
|---|---|---|
| Active Cases From Prior Reporting Period | 59 | 58 |
| Received During Period | 22 | 17 |
| Closed Out During Period | 23 | 27 |
| In-Process at End of Period | 58 | 48 |
| Cases Forwarded to the Office of the Director During Period for Adjudication | 2 | 4 |
| Cases Reported in Prior Periods With No Adjudication by the Office of the Director | 2* | 1** |

*These cases are described in Semiannual Report Number 15, pages 37 through 41.
**This case is described in Semiannual Report Number 15, pages 40 through 41.

During this reporting period, we closed 27 cases, 24 of which have not been discussed in this report. These latter cases involved allegations of plagiarism (verbatim and/or intellectual theft), mishandling of NSF proposals by NSF staff, violations of the confidentiality of peer review, destruction of scientific samples, misappropriation of equipment, hindrance of research progress by discrimination or harassment, false statements in proposals, or falsification of data. Many of these cases contained multiple allegations of misconduct in science. After reviewing information available to us from NSF or other sources, we found it necessary to obtain additional information from the subjects in nine of these cases. All 24 cases were closed at the inquiry stage.

## TABLE 5
## ASSURANCES AND CERTIFICATIONS RECEIVED*

| | |
|---|---|
| Number of Cases Requiring Assurances at End of Period | 3 |
| Number of Cases Requiring Certifications at End of Period | 5 |
| Assurances Received During This Period | 0 |
| Certifications Received During This Period | 0 |

*NSF accompanies some findings of misconduct in science with a certification and/or assurance requirement. For a specified period, the subject must confidentially submit to the Assistant Inspector General for Oversight a personal certification and/or institutional assurance that any newly submitted NSF proposal does not contain anything that violates NSF's regulation on misconduct in science and engineering. These certifications and assurances remain in OIG and are not known to, or available to, NSF program officials.

# DECISIONS BY THE OFFICE OF THE DIRECTOR

## Violating the Confidentiality of Peer Review and a Pattern of Plagiarism

In Semiannual Report Number 15 (page 37), we discussed the case of a PI who had plagiarized text from an overview article and an NSF proposal written by another scientist into his NSF proposals and proposals submitted to the National Institutes of Health (NIH). During our inquiry, we learned that the subject had been asked by a colleague to review an NSF proposal submitted by the other scientist (the original author) that the colleague had received for confidential merit review. Months later, when revising his declined NSF and unfunded NIH proposals, the subject transcribed text, without attribution, from pages he had photocopied from the confidential proposal into his own submissions. The subject had specifically requested that NSF not send his proposal to the original author because that author had a "conflict of interest" with the subject's department. Although the NSF proposal was declined, the NIH proposal was funded.

Because the allegations involved both NSF and NIH proposals, we coordinated the referral of the investigation into this case to the institution with the Public Health Service's (PHS) Office of Research Integrity (ORI). After investigation, the institution concluded that the subject had committed misconduct in science. Based on the subject's four separate statements during the investigation that he had never plagiarized material in the past, it concluded that the subject's actions were isolated instances.

As part of our review of the institution's investigation report, we obtained and reviewed earlier proposals submitted by the subject. While this review was in progress, ORI informed us that it had decided to close its case. Based on its review of the institution's investigation report, ORI concluded that the subject had committed scientific misconduct by plagiarizing material into the NIH grant. ORI executed a voluntary agreement with the subject requiring that, for 3 years, the institution must submit and endorse the subject's certification that all contributors to any application or report are properly cited or acknowledged. The agreement also excluded the subject from serving in an advisory capacity for the PHS. ORI informed the subject that his name had been entered into the PHS ALERT system and that it would remain in the system for 3 years.

During our review of the subject's earlier NSF and NIH proposals, we found that the institution and ORI had not uncovered the true extent of the subject's plagiarism. We found that these earlier NSF and NIH proposals contained text that had been copied without attribution from an overview article coauthored by the original author. We found that much of this text was carried over into the NIH and NSF proposals that were the focus of the institution's investigation. Each of the four sequentially submitted proposals contained copied text not found in the previous proposal.

We concluded that the subject knowingly plagiarized text into his earlier NSF and NIH proposals and that he willfully plagiarized text into his revised proposals from the original author's confidential proposal. He knowingly violated the confidentiality of peer review, and he exhibited a pattern of plagiarism in the proposals he submitted to two federal agencies. We recommended that the Acting Deputy Director find that the subject committed misconduct in science and debar him from receiving federal funds for 2 years and prohibit him from participating in NSF's review process for 3 years. We recommended that, for 2 years following the debarment, the subject be required to certify that his proposals contain nothing that violates NSF's misconduct regulation and accompany his certification with an assurance by his departmental chairperson that the proposal contains no plagiarized material.

The Acting Deputy Director found that the subject plagiarized text into two NSF proposals. He concluded that the subject's actions were more egregious because he plagiarized text from an NSF proposal submitted by the original author that he knew was confidential and were more serious because he "engaged in a pattern of plagiarism by submitting four proposals to federal agencies which contain plagiarized text." The Acting Deputy Director concluded the subject committed misconduct in science and issued a notice proposing to debar him for a period of 2 years and to prohibit him from serving as a reviewer, advisor, or panelist for NSF for a period of 3 years.

## Programmer Falsifies Data

In Semiannual Report Number 16 (page 50), we discussed a case of a programmer who falsified data to confirm a previously untested scientific hypothesis, allegedly as a result of a long-standing psychiatric disorder. We recommended that NSF enter into an agreement with the programmer whereby the programmer would exclude himself from employment in federally funded projects for a minimum of 3 years. We recommended that this be followed by a 2-year period during which the programmer would agree not to accept employment on federal projects without informing responsible officials of his past misconduct. NSF's Acting Deputy Director decided to reprimand the programmer and debar him from receiving federal funds for 3 years. He concluded that these actions were sufficient to protect the government's interest.

## Debarment Proposed for Obstruction of Agency Proceedings

In Semiannual Report Number 16 (pages 49 and 50), we reported our recommendation that the Acting Deputy Director terminate NSF's current award to a university professor and debar him for 3 years from receiving federal funds for his having submitted and vouched for the authenticity of false evidence during an investigation into allegations that he had committed misconduct in science. During this reporting period, NSF issued a notice proposing to debar the professor for 3 years. The professor submitted a written opposition to the notice and requested a hearing. NSF is considering that request.

work if the report's results weren't what the PI expected. He lacked the time to resolve the scientific issues raised by the report, and he feared not getting authorship credit for the work he had done.

We concluded that, in creating the report with the intent to deceive the PI, the subject acted purposefully. Since the uncontested evidence established that (1) the subject falsified the report and (2) he did so purposefully, we concluded his actions constituted a serious deviation from accepted practices, which is misconduct in science.

We recommended that NSF find that the subject committed misconduct in science and take the following actions as a final disposition in this case. First, NSF's Acting Deputy Director should send the subject a letter of reprimand concluding that he committed misconduct in science. Second, NSF should require that for the next 3 years, the subject submit, in connection with any NSF-supported publication or submission to NSF, a certification to OIG that to the best of his knowledge, his documents contain no false data and no hypotheses or conclusions based on falsified data. Third, NSF should require that the subject ensure that an appropriate supervisory official provides an assurance that, to the best of his or her knowledge, the subject's work associated with any NSF-supported publication or submission to NSF does not contain falsified data and presents neither hypotheses nor conclusions based upon falsified data. We did not recommend notification of the subject's home university because this was an isolated instance of misconduct and it is highly unlikely that the subject will have access to federal funds.

## Student Exhibits a Pattern of Falsifying Time Sheets and Fabricating Data

A university informed us that an undergraduate student working in an NSF-supported laboratory was alleged to have committed "fraud and theft" in connection with her work as a student laboratory aide. The university subsequently informed us that the student had confessed to falsifying time sheets and fabricating data in two research laboratories, one of which was supported by NSF. The university's records showed that, over a period of 11 months, the student received almost $6,000 based on claims she made on 31 falsified time sheets, 9 of which (approximately $2,000) involved the NSF-supported project.

We learned that the student had been conducting sample analyses for over a year and was a trusted laboratory aide. During the PI's 12-month sabbatical at another institution, the student was to continue these analyses without direct supervision. The student said she was working at night and on the weekends to accommodate her work in the other laboratory and her class schedule. The PI had instructed the accounting office to process unapproved timecards as long as the claimed time was consistent with previous claims. After returning to the university, the PI requested the raw data supporting the data summary sheets the student had provided to the PI. The student initially claimed to have lost the raw data and the samples she was to have analyzed. On searching the laboratory, the PI found the samples and learned that the condition of the samples was inconsistent with their being processed for analysis. The student admitted to the PI that she had falsified her time sheets. Subsequently, when

questioned by the university police, the student confessed to data fabrication.

In ensuing state legal proceedings, the student pleaded guilty to a misdemeanor offense of theft by deception. In lieu of a 12-month jail sentence, she was placed on probation for 12 months, required to pay a fine and make restitution, and required to send the PI a letter of apology. The university informed us that, in a separate proceeding, its Student Behavior Committee unanimously recommended that the student be dismissed and that she be required to disclose fully the reasons for dismissal to the Dean of Student Affairs, if she applies for readmission.

We concluded that a preponderance of the evidence supports the conclusion that the student fabricated data to support the claims on her falsified time sheets and that she acted willfully. We concluded that the student's action in falsifying time sheets and fabricating data seriously deviates from accepted practices in the scientific community.

The student's action was made more serious because she showed no remorse for the effects of her misconduct on other researchers. She relied on, and abused, the trust scientists place in their subordinates to faithfully report the results of their experiments. The student abused the long-standing tradition of independent research and, left undetected, could have introduced errors into the research record. Because of her action, the PI's and the PI's colleagues' research programs were delayed and disrupted for 1 year. Finally, the student falsified time sheets and fabricated data under the PI's two successive NSF awards and in two separate laboratories at the university. Such actions can only be considered a pattern of misconduct.

We concluded that the university's action in dismissing the student did not protect the government's interests. The student has shown that she can be considered a skilled laboratory technician, but that she has failed to internalize scientific norms of conduct and has failed to act with integrity when independently gathering research data. We recommended that NSF send the student a letter of reprimand informing her that it has concluded that she committed misconduct in science and that it debar her for a period of 1 year from the date of NSF's final disposition of this case.

## Plagiarism of Graduate Students' Theses by Faculty Advisor

We received an allegation that the subject, an experienced researcher at a southern university, had, on two separate occasions, plagiarized materials from his graduate students' Master's theses. He allegedly copied materials from his graduate students' theses into two of his publications without providing them authorship credit or appropriately citing the theses. In the first instance, more than half of the material presented in the subject's first paper appeared to be identical or substantially similar to material in one student's thesis. In the second instance, three figures presented in the subject's second paper appeared to be identical or substantially similar to material in another student's thesis.

We were informed that the university had determined that the subject was guilty of academic misconduct and sanctioned him. Because we had not received any information from the university informing us that it had initiated an investigation, we wrote to the Dean of the College requesting a copy of the university's investigation report. In response, we received a copy of a university report that found there was no unequivocal evidence that the subject had substantially misappropriated the students' intellectual property. The report recommended, however, that the Dean "censure" the subject "in a manner that he deem[ed] appropriate." The Dean determined that the subject had committed "two incidents of academic misconduct" and required that the subject write letters of apology to each graduate student and publish, at his own expense, corrections in the journals that published the subject's papers. Further, the Dean made the subject ineligible for salary increases for 3 years. Our review of the university's report determined that it did not contain sufficient documentation to allow us to independently assess the evidence related to the allegations. We requested that the university complete a final investigation report to document its conclusions.

The university-appointed Investigation Committee determined that the subject had copied material in the first paper from one student's thesis and material in the second paper from another student's thesis. It concluded that, in failing to provide authorship credit to the students, the subject seriously deviated from the accepted practice of his scientific community, committing misconduct in science. Further, the Investigation Committee determined that the subject did not commit plagiarism because (1) the original ideas in the papers were traceable to the subject's earlier published work, (2) the data in the papers were obtained at the subject's request, (3) the interpretations of the data were dependent on the subject, and (4) another coauthor on one of the papers had "extensively revised/ rewritten" the text of the student's thesis from which the material was copied. On these bases, the Committee argued that the work was conducted in a collaborative manner, which made it "shared intellectual property." Finally, it concluded that the sanctions imposed by the Dean were appropriate.

We agreed that the subject committed scientific misconduct by seriously deviating from accepted practices when he denied two students legitimate and deserved authorship credit on work taken from their Master's theses. Further, we believe that, in doing so, the subject committed plagiarism. The fact that the ideas in the theses were traceable to the subject's earlier work and that the

students worked under the subject's guidance does not mean that he was entitled to claim as his own the students' thinking or their experimental efforts described in their theses. The subject's contributions to the students' theses' efforts did not allow him to appropriate their work, especially since he had previously acknowledged, as a member of the students' thesis committees, that the theses contained the students' work.

The Committee determined that the subject had acted in a willful manner when he failed to provide authorship credit to the students. We concluded that the subject acted at least knowingly when he copied the students' materials into the papers without proper attribution or citation. The subject's actions are made more serious in these two instances because they deprived students under his direction of appropriate recognition for their work. We considered the subject's two distinct acts of plagiarism as evidence of a pattern. Finally, we noted that the subject, who had been specifically directed by the Dean to write letters of apology to the students, had done so, but without any expression of remorse.

We concluded that the university's actions did not fully protect federal funds: they failed to provide assurances that the subject will adhere to the community's high mentoring and scholarship standards as NSF expects thereby protecting NSF's interests in educating the next generation of scientists and engineers. We recommended that NSF's Acting Deputy Director send the subject a letter of reprimand informing him that NSF has made a finding of misconduct in science against him. In addition, we recommended that, for 3 years from the final disposition of this case the Acting Deputy Director require that (1) a university official provide assurances that the subject behaves appropriately as a mentor to his graduate students in connection with NSF-supported activities, and (2) the subject provide a certification countersigned by all the project participants that, with every NSF-supported publication on which he is an author, he has appropriately acknowledged all individuals involved with the project.

## Postdoctoral Researcher Falsified Data

A midwestern university investigated an allegation of data falsification against a postdoctoral researcher who worked for the PI of an NSF award. The subject sent material to a commercial company for analysis, and received a faxed analysis of the results (the report). The report's results did not agree with the subject's expected theoretical calculations as well as he had hoped, and the subject altered the report to better agree with his predictions. The falsified report was discovered and brought to the attention of the PI, who contacted the company to ask for another copy of the results. The PI noticed that the data in the two reports were different. At the PI's request, the Chair of the PI's department arranged a meeting between the Chair, the PI, and the subject. During this meeting, the subject admitted that he had falsified the data in the report.

During the university's investigation, the subject explained the motive for his action. The subject was a foreign citizen and planned to return to his home country after his research with the PI ended. The subject said he felt he had to accomplish as much work as possible before he returned to his home country. He said he falsified the report because he was afraid the PI would stop his

# CASES LEADING TO INVESTIGATIVE REPORTS SENT TO THE OFFICE OF THE DIRECTOR

## Subject Misrepresented Research Progress and Research Capabilities

A western university informed us that it had completed an inquiry into alleged misrepresentations in an NSF renewal proposal submitted by the subject. It was alleged that

- the proposal falsely implied that the data in one figure were gathered from the experimental system that was the focus of the proposal;
- the proposal falsely claimed that two different compounds could be used to establish conditions necessary for particular experiments; and
- a procedure used to prepare samples from the experimental system did not work as claimed in the proposal.

After the university was informed of the allegations, the subject withdrew the renewal proposal from review at NSF. Shortly thereafter, he submitted a revised renewal proposal and NSF provided a large, multiyear award based on its contents. After investigating the allegations, the university concluded that the subject had committed misconduct in science and reprimanded him.

We reviewed information provided by the university as well as the subject's submissions to NSF and decided to initiate our own independent investigation into these allegations. We also investigated a new allegation that the subject had misrepresented his research progress in his submissions to NSF. As part of our investigation, we interviewed the subject and sought expert advice from NSF program staff.

We concluded that the subject's failure to identify the actual experimental system used to gather the data in the figure was misleading. The text of the renewal proposal falsely implied that the experimental system used was the one the subject described as the focus of his proposed research.

The subject claimed that his renewal proposal statements about the two compounds were based on oral conversations with his graduate student. He included these statements in his proposal even though he seriously doubted the student's experimental and recordkeeping abilities and he had not reviewed the data before including them. Before submitting his revised renewal proposal, he conducted new experiments and modified the proposal language to reflect the new results.

Although the renewal proposal claimed that the sample preparation procedure was suitable for the proposed experiments and that the procedure worked "routinely," we learned that the subject's laboratory could rarely, if ever, gather usable data from these samples. His revised renewal proposal also failed to describe his laboratory's actual abilities to prepare these samples.

The subject's annual reports for his first NSF award claimed, as progress, preliminary data that he had collected with a collaborator 2 years before his receipt of any NSF research funds. He also failed in these progress reports to acknowledge his collaborator. These preliminary data were originally used as

background information to partially support one of the research objectives in the subject's original proposal to NSF.

The allegations we investigated focused on the subject's claims of progress on the research objective partially supported by the preliminary data and on his redescription of this objective in his renewal proposals. The subject told us that he had included this objective in his renewal proposals because his graduate student had been unable to make significant progress on it. Neither renewal proposal stated that his laboratory was unable to conduct the proposed research in the experimental system emphasized in this objective. He told us that he had not discussed his inability to conduct the proposed research because of NSF's proposal page limitation. Yet, in place of discussions about actual progress on this objective, the subject continued to redescribe experiments conducted before he received NSF support.

We concluded that the subject intentionally misrepresented his laboratory's progress and its ability to conduct certain experiments to ensure continued support from NSF: he was successful in this effort. We also concluded that these actions constituted misconduct in science.

Based on these conclusions, we recommended that NSF's Acting Deputy Director send the subject a letter of reprimand concluding that he committed misconduct in science. For a period of 3 years from the final disposition of this case, we recommended that NSF

- require that the subject submit a certification as part of any submission to NSF that the submission is free of misconduct;
- require that the subject secure, and include as part of any submission to NSF, an assurance from a knowledgeable university official who has reviewed his research records that the submission is accurate and complete;
- reduce the annual increment of any NSF award to the subject to $65,000 or to an amount commensurate with the program officer's evaluation of the subject's research capabilities;
- reduce the duration of any NSF award to the subject to 2 years or a length of time commensurate with the program officer's evaluation of the subject's research capabilities; and
- consider requesting that the subject's requests for funds from NSF's Research Experiences for Undergraduates program be accompanied by assurances from a knowledgeable university official that his mentoring and laboratory notebook practices conform with acceptable scientific norms.

## Notifying Universities of Misconduct

Unlike some federal agencies, NSF does not routinely publicize the names of subjects found to have committed misconduct in science. Public notification of the names of subjects found to have committed misconduct occurs only in the most serious cases, where the misconduct leads to government-wide debarment. In these instances, the General Services Administration publishes the names of the debarred scientists. The NSB has advised us that it believes in less serious cases publicizing names would be too harsh an action, disproportionate to the seriousness of the misconduct.

This advice raises a difficult question, which is whether to recommend that NSF inform a subject's sponsoring institution about its finding of misconduct. In deciding what action to recommend we are guided by our responsibility to protect federal funds and to safeguard the integrity of the federal process for evaluating grant proposals and managing grant awards.

OIG uses the same analysis to determine whether to recommend that the subject's institution be informed irrespective of whether the misconduct occurred at that institution. In many cases, the subject's university is aware of the misconduct because it investigated the allegations or has asked about the outcome of the OIG investigation under the Freedom of Information Act. If a subject relocates to another university that is unaware of the misconduct, we consider whether protecting the government's interests requires us to recommend that NSF inform this university.

An important factor in our analysis is the subject's potential access to federal funds. How this factor affects our analysis is illustrated by a case we forwarded to the Acting Deputy Director in this period (see page 39 of this Semiannual Report). We concluded that the subject, who was a foreign national temporarily working in the United States and who had returned to his home country, was unlikely to have ready access to federal funds.

This case also illustrates that we take into consideration whether the subject perpetrated a single instance of misconduct or if there is evidence of a pattern. In our view, evidence of a pattern increases the likelihood that the subject may commit misconduct again and therefore should be monitored at the new university. Here, we found no evidence of a pattern, so we did not recommend notification of the subject's home university.

We also consider whether a subject's relocation to a new university allows that individual to avoid any monitoring the subject's former university may have imposed and whether that monitoring was important in protecting the government's interests. If we decide monitoring is important, we would recommend that NSF notify the subject's new university so that monitoring of the subject could be reestablished.

When a university is aware of misconduct, whether it occurred at that institution or not, it can evaluate for itself what action(s) it may wish to take to prevent recurrences. These include providing ethics counseling; requiring that the subject discuss with an appropriate university official the university's research standards, practices, and misconduct policy; or placing more supervision over the subject's research activities. While considering the specifics of each case, our concerns for protecting the government's funds and interests, as well as the university's concerns, must be balanced against the seriousness of the misconduct and the probable long-term consequences of disclosure on the subject.

The probable consequence on both the subject and the subject's new university is another important factor. For scientists in the early part of their careers, disclosure of a misconduct finding to the subject's new university could have long-term adverse effects on the subject's reputation, a consequence that might be more serious than warranted by the misconduct.

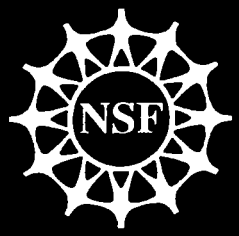
In many findings of misconduct, NSF requires that the university monitor the subject's proposals or awards for a specified period to ensure compliance with NSF's imposed conditions. In these situations, disclosure to the university is only necessary if the subject submits a proposal or NSF decides to make an award. We had those concerns in a case (discussed in Semiannual Report Number 12, page 29, and Semiannual Report Number 13, page 38) where a subject relocated after an investigation that revealed a pattern of serious noncompliance with NSF's grant conditions. Accordingly, we recommended that NSF require monitoring of any awards the subject might receive. NSF agreed with our recommendation and, if the subject had been recommended for an award, would have required the new institution to establish and enforce special monitoring of the subject's compliance with NSF's grant conditions, a procedure that would have led to disclosure of the subject's misconduct. Because the subject did not receive an NSF grant during the monitoring period, NSF did not notify the new institution.

Our recommendation to NSF is based on our analysis of the actions required to ensure fundamental fairness, protect federal funds, and safeguard the integrity of the federal process. Of course, NSF decides these matters independently and is free to decline to follow our recommendations.

## NSF's Definition of Misconduct in Science and Engineering

Fabrication, falsification, plagiarism, or other serious deviation from accepted practices in proposing, carrying out, or reporting results from activities funded by NSF; or retaliation of any kind against a person who reported or provided information about suspected or alleged misconduct and who has not acted in bad faith

# SEMIANNUAL REPORT TO THE CONGRESS




OFFICE OF
INSPECTOR GENERAL

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NATIONAL SCIENCE
FOUNDATION

MARCH 1998

# Misconduct in Science and Engineering

## Partnership With Universities in the Referral Process

Our practice of referring allegations of misconduct in science to awardee institutions for investigation is guided by NSF's misconduct in science regulation that affirms "awardee institutions bear primary responsibility for prevention and detection of misconduct" (45 C.F.R. §689.3(a)). This practice permits awardee institutions to take responsibility for activities on their campuses and provides us with the relevant scientific community's assessment of whether a subject's actions are considered serious.

As explained in Semiannual Number 12 (page 26), we refer cases to awardees for investigation after we, or the awardee, conduct an inquiry to determine whether the allegation requires investigation. A referral allows each partner to perform its role. When an awardee institution accepts the referral of an allegation, we delay our own investigation, pending the receipt of the institution's investigation report. We review an awardee institution's report to determine if it is accurate and complete and if usual and reasonable procedures were followed. We determine whether we can use it instead of initiating our own independent investigation.

The balance that is maintained between the partners permits each to take actions it considers appropriate and necessary. Although we both share responsibility for the integrity of the scientific community, an awardee institution takes action within its community and NSF takes action within the federal context.

We reviewed our closed cases to develop a quantitative assessment of the frequency with which we refer cases and the effectiveness of our referral process. We determined that, from our office's inception in 1989 until September 30, 1997, awardee institutions conducted 88 percent of our completed investigations. We were unable to refer a few of these investigations to awardee institutions because we were notified of the matter after they had completed their efforts. The remaining 12 percent were investigated by our office alone because the institution's size, the location of the individual, or the nature of the allegation precluded an impartial evaluation of the allegations by the institution.

We considered 61 percent of the investigations conducted by awardee institutions to have met our criteria, and accepted the institution's investigation reports as our own, often after contacting the awardee institution to request clarification or supplementary information. The remaining 39 percent of awardee investigations required further investigation by our office. Our investigative efforts were principally to develop more evidence about intent, seriousness, or a pattern of behavior uniquely important in support of our recommended actions to NSF management. Of all the investigations conducted by awardee institutions, we considered only 10 percent to be unacceptable, requiring that we conduct our own review.

Our practice of referring cases to awardee institutions has routinely provided our office with information upon which we have relied when making our own recommendations.

Although we frequently supplement these reports with additional information, we have rarely been required to conduct an entirely new review. We believe that the referral process strengthens our partnership with awardee institutions and the scientific community. It ensures that our recommendations are grounded in the relevant scientific community's assessment of its members' actions and not in a process dissociated from the community served by NSF.

# Case Leading to Investigative Report Sent to the Office of the Director

## Plagiarism From Three Published Papers

We received an allegation that the president of a small business (the subject) plagiarized from a previously published paper (paper 1) into his proposal submitted to NSF's SBIR program. It was alleged that the subject's proposal was based on the same basic research ideas put forth in paper 1 and that it relied significantly on the theory and the application of that theory as developed in paper 1. We determined that the subject's proposal contained extensive, verbatim text, a figure, references, and formulas identical to those in paper 1, but without attributing or distinguishing the copied material from material original to the proposal. We also determined that the subject's proposal contained verbatim text without attributing or distinguishing it from a second, published paper (paper 2).

We wrote to the subject three times and telephoned him once asking for an explanation for the similarity of his proposal to the published papers. We did not receive a substantive response. For this reason, we took the unusual step of proceeding without input from the subject.

We asked an expert in the proposal's field of science to compare paper 1 and the subject's proposal to evaluate the significance and seriousness of the duplication between the two documents. During his evaluation, the expert noticed that a figure in the proposal was an unattributed reproduction of a figure from a third paper and that most of that figure's caption was also copied. Our expert reported that most of the verbatim duplication between the proposal and paper 1 occurred in the section of the proposal containing the scientific and technical justification for using this specific approach to the problem. The expert said that the volume of copied material was substantial and that the proposal made use of the scientific research ideas originally presented in paper 1. We considered the subject's verbatim use of this material from paper 1 more serious because he incorporated almost all of the text that presented and justified the original ideas in paper 1 into his proposal.

Although the subject included citations in his proposal to papers 1 and 2, these citations did not adequately convey to the reader that he used ideas, verbatim text, formulas, references, and a figure from paper 1 and verbatim text from paper 2 in his proposal. Our expert said that in key places, proper attribution was not given and it was not clear to the reader that much of the background discussion came from paper 1. The expert considered the non-

attribution significant and serious. We concluded that a preponderance of the evidence supported the conclusion that the subject copied substantial material from three published papers and used scientific research ideas from paper 1 in his proposal.

It is inconceivable that the subject could have inadvertently copied such a large quantity and variety of material without acting intentionally. He copied extensive material from three published papers and, in particular, two figures from two different published papers were xerographically reproduced and included in his proposal without any citation or acknowledgment. In light of the fact that the subject did provide some citations to source documents within the proposal, including some properly referenced figures, it is not probable that the subject forgot to provide the appropriate references and to distinguish the copied text from his own. The subject demonstrated a selective use of citations, not a lack of knowledge about how to use them.

We believe that a preponderance of the evidence supports the conclusion that the subject acted knowingly when he plagiarized material from three source documents with the intention of deceiving NSF's reviewers and Program Director into believing that these were his ideas, and that he had the expertise and knowledge to complete the project.

We recommended that NSF conclude that the subject committed misconduct in science and take three actions to protect the federal government's interest. First, NSF should send a letter of reprimand to the subject informing him that NSF has made a finding of misconduct in science against him. Second, for 3 years from the final disposition of this case, NSF should require the subject to obtain certification, signed by himself and co-signed by the PI or manager of any federally sponsored research, that any documents the subject prepares in connection with the research project contain no plagiarism. Third, NSF should exclude the subject from participating as an NSF reviewer, advisor, or consultant for 3 years from the final disposition of this case.

# Decisions by the Office of the Director

## Agreement to Voluntary Exclusion Settles Case of Obstruction of Agency Proceedings

As reported in Semiannual Report Number 17 (page 43), at our recommendation, NSF issued a notice proposing to debar a university professor from receiving federal funds for his having submitted and vouched for the authenticity of false evidence during an investigation into allegations that he had committed misconduct in science. In this reporting period, the professor entered into a binding agreement with NSF to resolve the debarment proceeding and misconduct-in-science allegation. Although denying wrongdoing, the professor acknowledged that there was sufficient evidence

> to permit a fact finder to conclude that he submitted falsified evidence for the purpose of disproving the

misconduct in science charge being investigated by the OIG, that [he] knew that the evidence was falsified, and that [he] made false statements under oath in the OIG investigation concerning the authenticity of the evidence.

The professor accordingly withdrew his request for a fact-finding hearing, and voluntarily excluded himself from receiving any funds from, serving as a PI on, or having supervisory responsibility, substantive control or critical influence over, awards from any federal agency for 2 years following the date of the agreement. He also voluntarily excluded himself for the same period from serving as a merit reviewer, panelist, or member of a Committee of Visitors for NSF. In turn, NSF agreed not to issue a finding of misconduct in science against the professor or to make further referrals to federal or state prosecutorial authorities based upon the facts in the administrative record.

NSF also agreed to fund a pending proposal by his university on which the professor had originally been named as PI, conditioned on his replacement as PI and his exclusion from supervisory or management control over the research. This agreement tracked the terms of NSF's debarment regulation, 45 C.F.R. Part 620, which contemplates that persons debarred or voluntarily excluded from financial assistance and benefits under federal programs and activities may not have "primary management or supervisory responsibilities" or have "critical influence on or substantive control" over a covered transaction during the period of debarment or voluntary exclusion. However, the university ultimately withdrew the proposal "due to the voluntary exclusion of [the professor] from receiving Federal funds and the university's inability to arrange for an appropriate substitute PI."

## Postdoctoral Researcher Falsified Data

In Semiannual Report Number 17 (pages 39-40), we discussed the case of an NSF-supported postdoctoral researcher who falsified data from a commercial firm's analysis. We recommended that NSF's Acting Deputy Director find the subject committed misconduct in science and impose certification and assurance requirements in the event the subject associated himself with an NSF-supported project. NSF's Acting Deputy Director sent the subject a letter of reprimand that concluded he committed misconduct in science. He required for the next 3 years that the subject submit, in connection with any NSF-supported publication or submission to NSF, a certification to OIG that to the best of his knowledge, his documents contain no false data and no hypotheses or conclusions based upon falsified data. He also required that the subject ensure that an appropriate supervisory official provide an assurance that, to the best of his or her knowledge, the subject's work associated with any NSF-supported publication or submission to NSF does not contain falsified data and presents neither hypotheses nor conclusions based upon falsified data.

## Use of Paraphrased Text in an NSF Proposal

In Semiannual Report Number 15 (page 40), we described a case of a PI whose failure to cite text paraphrased from a source document had given rise to an

allegation of misconduct in science. We deferred the case to the institution whose Investigation Committee did not view the subject's copying as plagiarism. The Committee determined that the subject had not committed misconduct in science. We regarded the Committee's view of plagiarism as too narrow because it did not recognize that paraphrased text needed to be cited to a source document.

The adjudicator, NSF's Acting Deputy Director, determined that although the subject "did not adequately apprise the reader of the full extent of [his] reliance on the . . . review article in the background section of [his] NSF proposal," he "did not seriously deviate from accepted practices or engage in scientific misconduct." He cautioned him

> to use great care in future NSF proposals or submissions to ensure that [he] attribute[d] full credit to the original author and that [he] offset verbatim or paraphrased text and include[d] citations to the source document.

## On Appeal, NSF Upholds Misconduct Decision

In Semiannual Report Number 17, we discussed NSF's Acting Deputy Director's decision to debar for 2 years a scientist who plagiarized text from a review article and an NSF proposal. The plagiarized text appeared in four different proposals that sought funding for the same underlying research project. The subject appealed this decision to NSF's Director. The Director concluded that the administrative record established that the subject plagiarized text into four proposals and that he attempted to conceal his actions by requesting that the original author not serve as a peer reviewer of his proposal. The Director concluded that the 2-year debarment was warranted and observed that the University investigation committee recommended a longer period of debarment. He noted that the University investigation committee was unaware of the full extent of the subject's plagiarism (which we discovered during our subsequent investigation).

# Misconduct Cases Involving Citation Errors in NSF Proposals

PIs cite papers and manuscripts in NSF proposals to reference work and to show their accomplishments under prior NSF-supported projects. This information needs to be prepared carefully so the PIs' proposed research can be evaluated and compared with competing proposals fairly by everyone involved in the review process. We closed three cases this period in which inconsistent, incomplete, and inaccurate citations for papers and manuscripts gave rise to allegations of misrepresentations in NSF proposals.

In the first case, it was alleged that the subject, in three successively submitted NSF proposals, misrepresented facts about the submission and publication of a co-authored manuscript. In his first proposal, the subject stated in two separate sections that the manuscript was either submitted to one journal or to a second journal. In three separate sections of his second proposal, the subject cited the manuscript as "accepted" by the second journal and included the date of acceptance by the journal in two of these sections. In the third proposal, the subject listed the manuscript as "accepted" by the second journal. In his most recent progress report for his award (from the first proposal), he stated that the manuscript had been published in yet a third journal.

We learned from the subject that the manuscript had been submitted to, but rejected by, the first journal. The subject's co-author had then submitted a revised manuscript for comment to a member of a scientific society that publishes the second journal. The co-author relayed comments attributed to the member to the subject. The subject incorrectly interpreted these comments to mean that, pending some revisions, the manuscript would be published in the second journal. The subject then began incorrectly citing it as "submitted" to, and then as "accepted" by, the second journal in his NSF proposals. Later, the subject learned that the society member had not read the manuscript. Once he had, he said it was not ready for publication. The co-authors then revised the manuscript and submitted it to the third journal, in which it was published. The subject said that his actions were "honest error[s]," but that he had also been "naive and incorrect." We considered the subject's actions to be a bad practice, but not sufficiently serious to initiate an investigation. We concluded that no further action was required in this case because (1) he is aware, through our exchanges, that his incorrect claims about his manuscript were a bad practice and do not meet the community's expectations for high scholarship and (2) the subject's accurate citation for the manuscript in his progress report for the award had corrected NSF's record.

In the second case, a reviewer alleged that the subject misrepresented information in his proposal because he failed to cite a manuscript that discussed the results of the proposed project. We learned that the subject had submitted four proposals on the same idea over a 3-year period. The first three proposals were declined (the third was the focus of this

inquiry) and the fourth was funded. According to the subject, there were two separate manuscripts describing a pilot project; the second was a revision of the first. He explained that the earlier manuscript had been rejected by the editor shortly before he submitted his third proposal and that the later manuscript was submitted after NSF received it. He said he should have clarified the status of the project and the relationship of the manuscripts to it in his proposal. We concluded that the reviewer's concerns could have been avoided if this explanation had been included in the third proposal.

In the third case, a reviewer alleged that the subject had misrepresented the titles of two co-authored papers and a co-authored manuscript in two separate sections of his NSF proposal by changing the species name of an organism in those titles. For the two papers, we confirmed that the journals had not been officially notified of any corrections. We learned that the correct speciation of the organism has been the focus of an ongoing scientific disagreement. In one of the papers, the authors discussed their uncertainty in using the species name in the title and deferred any final decision on its correctness until they had more information. We concluded the title changes were consistent with the subject's attempt to clarify his position in the debate. Further, the changes had not introduced a significant error in the record or misinterpreted his research. We concluded that the subject's changes were a careless way of providing information in an NSF proposal; however, they were not, in this case, sufficiently serious to pursue.

These examples demonstrate the importance of careful preparation of proposals. The *Grant Proposal Guide* instructs applicants to prepare their proposals with "strict adherence to the rules of proper scholarship and attribution" (NSF 98-2). If the subjects in these three cases had carefully checked the information provided in their proposals prior to submission, the interpretations that led to the allegations of misconduct in science could have been avoided.

# Examination of Merit-Review System

The Senate Committee on Commerce, Science, and Transportation was concerned about the possibility of NSF awards being given out in circumvention of merit review. At the Committee's request, we sought to identify any discretionary spending programs that have no formal merit-based criteria established or that have criteria that are not being properly applied. We determined NSF's merit-review system uses reasonable and impartial criteria that are fairly applied throughout NSF's programs.

All NSF awards are merit reviewed, either through the peer-review system, which solicits opinions from experts outside the Foundation, or through internal review by NSF program officials. Awards made without outside peer-review are restricted primarily to special classes of proposals, such as workshops, conferences, and Small Grants for Exploratory Research. We examined awards for FY 1997 that were made without outside peer-review and determined that the waivers of outside peer review were reasonable and consistent with NSF guidelines.

While there are both statutory and administrative priorities regarding particular programs, such as K-12 science education, global climate change, or polar programs, these are not specific to individual institutions. The only exceptions we found were in report language accompanying FYs 1994 and 1995 NSF appropriations that provided funds to review NSF's research centers. However, these allocations appear to have been directed at administrative issues rather than substantive scientific research.

Our findings are consistent with those of reviews conducted by the General Accounting Office, an external Proposal Review Advisory Team, and a joint NSF and National Science Board Task Force on Merit Review. We concluded that formal merit-based review criteria exist to guide all of NSF's funding decisions, and that the applicable criteria are appropriately applied to these funding decisions. We did not identify any NSF programs or awards for which such criteria were absent or improperly applied.

# OFFICE OF
# INSPECTOR GENERAL

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# SEMIANNUAL REPORT
# TO
# THE CONGRESS

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**September 1998**

## Fabrication of Data

We received allegations of research fabrication against a scientist who recently received her doctoral degree. The research misconduct committee in the institution's chemistry department reviewed the evidence and concluded that "the heart of [the scientist's] dissertation [was] based on fraudulent data" and found "a very clear pattern that undermines the entire basis for the research reported in the dissertation." The scientist did not contest the majority of the allegations of fabrication against her and withdrew her dissertation. The institution then rescinded her doctoral degree.

We reviewed the institution's evidence and agreed that the independent research reported in the dissertation had been fabricated by cutting and taping spectra to remove some spectral peaks and add new ones. We agreed with the committee that the willful research fabrications, which undermined the basis for the research in the dissertation, were a serious deviation from accepted practices and, therefore, misconduct in science under NSF's regulation.

We recommended that NSF's adjudicator affirm the seriousness of the subject's actions by finding that the subject committed misconduct in science and by issuing a letter of reprimand. We believe no further action by the government is necessary at this time because the institution's actions were adequate to protect the government's interests, and the subject told us that she has not worked in chemistry since she forfeited her degree. We also recommended that NSF develop a notification requirement so that, if the subject works on federally supported scientific or engineering research or education within the next 3 years, appropriate safeguards could be in place.

## Plagiarism in Science Education Proposal

We reviewed evidence of plagiarism in an NSF-supported education project. Almost the entire text of the proposal was identical or substantially similar to that of an earlier proposal (the source) submitted by educators at another university. The experienced PI and co-PI (the subjects) who submitted the allegedly plagiarized proposal stated in their proposal that their project would be modeled after the source project and would draw extensively on educational materials originally developed for that project. However, the subjects did not indicate that the language of their proposal was taken directly from another source and was not original to their proposal.

We referred the case to the subjects' university for investigation. The university concluded that the proposal was plagiarized, that its submission constituted misconduct in science, and that both subjects were responsible for the misconduct.

The university decided that the PI should write letters of apology to NSF and the authors of the source proposal; attest that future applications for support consist of original or properly attributed prose and ideas; and resign his position as Distinguished University Professor (while retaining his tenure, rank, and other university positions). The PI complied with the university's sanctions. The university also placed a letter of reprimand in the PI's personnel file, which will be removed after 3 years if there is no further evidence of misconduct. The university's recommendations regarding the co-PI were similar. When the co-PI did not comply with the university's request that he resign his title of Emeritus, the university stripped him of it.

Research scientists generally consider plagiarism a serious violation of professional standards. The university's investigation committee considered and rejected the idea that, with regard to plagiarism, professional standards in science education were materially different from those in scientific research, and we urged NSF to endorse this view.

We believe the large amount of verbatim plagiarism and the subjects' many years of professional experience contribute to the seriousness of the misconduct in this case. However, there are mitigating factors, including that the subjects stated that their project was modeled after the source project and that the subjects' misconduct appeared to be an isolated incident.

We recommended that NSF join the university in concluding that the subjects' actions constitute misconduct in science and send each subject an appropriate letter of reprimand. We concluded that the university's actions were otherwise sufficient to protect NSF's interests and render additional NSF action unnecessary.

## NSF Proposes to Debar Student

In our September 1997 Semiannual Report (pages 40-41), we described the case of a student who, over an 11-month period, falsified 31 timesheets and fabricated data in connection with her work in two different research laboratories to justify her claims on the timesheets. She was convicted of a misdemeanor in a state court. The agency agreed with our recommendations and concluded that the student committed misconduct in science. Because of the seriousness of the fabrications and falsifications and the conviction, NSF proposed to debar her for 1 year.

## Review of Research Center's Policy for Payment of Administrative Costs

We received allegations that a research center at a state university had a policy designed to capture, for general administrative purposes, approximately $40,000 per year nominally requested by center faculty—and awarded by NSF—for research.

We determined that the center required faculty to transfer to the center from grant funds about 10 percent of their academic year salary before the center would authorize requests by the faculty for summer salary to be paid out of grant funds. At the center, this transfer was commonly referred to as a "tithe." These NSF grants generally did not fund salaries during the academic year. The center adjusted its accounting records for the period in which a faculty member's salary had been funded by the center to reflect a level of effort on the NSF award equal to the amount of the tithe, thus unencumbering the center's funds. The effect of the tithe was that funds in a sponsored research account—which are available for use by the faculty member for research purposes—were transferred to an account available for use by center administration for any purpose. The tithe thereby directly reduced the funds available to the faculty member for research, while increasing funds available for administration by the center. The tithing policy was not expressly disclosed by the center in its proposals to NSF.

Even though the awards did not expressly contain funding for academic year salaries, some NSF program officers advised us that, had they known, they might not have objected to funds being used for that purpose. Nonetheless, in our view, the tithe amounted to a questionable conversion of direct-cost funds into indirect-cost funds in a manner inconsistent with NSF's policy on the payment of salaries from NSF awards. In addition, the nondisclosure of the tithing policy caused NSF program staff and reviewers to evaluate requests for funds that proposals identified as research costs when the center intended to use the funds for administrative purposes.

We recommended that the center discontinue the tithing policy or explicitly disclose it in proposals to NSF so that reviewers and NSF management can formally evaluate it. In response to our report, the center discontinued the tithing policy. As a result, over the next 5 years approximately $200,000 of NSF funds will be used by the center in direct support of research, and the center's proposal budgets will contain accurate representations.

# Semiannual Report to the Congress


OIG

National Science Foundation

MARCH 1999

# FORMING INVESTIGATIVE PARTNERSHIPS TO RESOLVE CASES

Our November 1998 Strategic Plan emphasizes the importance of forming partnerships through our integrity efforts with members of the scientific and law enforcement communities. By working closely with our partners, everyone benefits from sharing experience and different perspectives and opinions. We apply the understandings we gain in the particular matter under review and in subsequent cases.

In civil and criminal matters we often work with awardee grants officials gathering information necessary to determine whether a matter appears to have violated a law or regulation. In instances where these matters involve individuals who have funding from other federal agencies, we work closely with staff from other IG offices as well as the Federal Bureau of Investigations (FBI), Defense Criminal Investigative Service (DCIS), and other law enforcement organizations. Once we have developed sufficient information to advise prosecutorial decisions about whether to pursue a case, we assist prosecutorial authorities in completing the investigation. For example, in this report, we describe two false claims cases in which we coordinated our efforts closely with university officials and law enforcement agencies to assist prosecutorial authorities in developing satisfactory resolutions to these matters (see pages 21 and 22). We also served as a liaison between local law enforcement officials and scientific personnel to improve working relationships and enhance security at an NSF-funded facility.

Through the process of resolving allegations of misconduct in science, we have developed strong, long-standing partnerships with awardee officials and NSF program officers across the scientific disciplines. NSF believes that awardee institutions are primarily responsible for the prevention and detection of misconduct, and our practice is to refer substantive allegations of misconduct in science to awardees for investigation. In this partnership, we contribute the experience gained from handling different types of allegations in many situations while relying on the experience and knowledge of awardee officials as well as the committees of experts they convene to assess these cases. We also frequently draw on the scientific expertise at NSF to assess scientific issues and provide us with insight concerning their scientific communities.

In this period, we met with awardee officials who were either beginning or in the process of conducting misconduct investigations. We worked closely with awardee officials and committees to develop satisfactory resolutions for our referred cases. The following misconduct cases describe successful outcomes that were developed through these partnerships.

## Plagiarism in Proposals Submitted to Two Different NSF Directorates

We received evidence of plagiarism in two NSF proposals submitted by a full professor to different NSF directorates about 2 months apart. The first proposal, requesting support for travel to another country to do research, was a pending award. The second proposal, requesting more substantial funds to support research work at the subject's university, had recently been declined. Over 90 percent of the text in both proposals was identical to an earlier NSF-funded proposal (the source proposal) submitted by another scientist (the author).

Although the subject had over 30 years of experience as a researcher and teacher, he did not indicate that the language of his proposals was taken from the source proposal and was not his original work. In our interview with the subject, he explained that he believed he had implicit permission from the author to use the text because they had been collaborators and the author had voluntarily provided him with a copy of the source proposal. The author told us that he had not given the subject permission to copy the text from the proposal and could not recall providing him with a copy.

We referred the investigation in this case to the subject's university. Immediately following our referral, we recommended, and NSF took, interim administrative action to defer a funding decision on the subject's first proposal pending resolution of the allegations of misconduct in science.

The university decided that the author was not a collaborator on the subject's proposals and that the copied text was not shared intellectual property. It found that the subject's use of verbatim material in his two proposals constituted plagiarism and that the subject acted recklessly.

The university sent the subject a letter of reprimand requiring that he: (1) not submit federal or state proposals and not serve as a PI on federal or state awards for 3 years, (2) withdraw his pending proposal that requested $12,192, (3) certify to the originality of any external proposals for an additional 2 years, and (4) read materials and attend workshops/meetings on the topic of integrity in research.

We concluded that the university's action regarding the subject's misconduct was significant and balanced. We recommended that NSF's interests would be served sufficiently by affirming that the subject committed misconduct in science and by sending him a letter of reprimand.

## Multiple Allegations of Plagiarism in Connection With NSF Proposals

We received allegations of plagiarism against the subject, an assistant professor, including one instance in which he copied 5-1/2 pages of material into an NSF proposal without providing adequate attribution. In each instance, the subject included general references to the source material, but did not indicate that the text was taken verbatim from the source material. Through our inquiry, we discovered that the subject submitted five NSF proposals that contained material copied without adequate attribution.

We referred the investigation to the subject's university. The university's investigative process identified other instances of unattributed copying in the five proposals discovered by our office and in three more proposals submitted by the subject to NSF and another federal agency. The university determined that the subject submitted eight proposals with inadequately attributed text; in four, the copying was limited to several sentences from abstracts. Four of the eight proposals were slight revisions of earlier proposals.

The university concluded that each instance of copying without adequate attribution was plagiarism, and therefore misconduct in science. Although the copied passages varied in length, the university considered each instance to be a significant deviation from accepted practices. After receiving the university's investigation report, the subject agreed to resign from his university position.

We agreed with the university that the subject committed misconduct in sci[illegible]. For NSF's purposes, we considered the instance involving 5-1/2 pages of copying without adequate attribution to be plagiarism and the other instances as reflecting a pattern of unacceptable behavior. We recommended that NSF send the subject a letter of reprimand concluding that he committed misconduct in science and require him to provide certifications and assurances in connection with any requests for NSF funding for 3 years. Since some of the eight proposals were submitted to other agencies, we suggested that NSF discuss its conclusions with other federal agencies. We concluded that the university's actions were otherwise sufficient to protect NSF's interests.

# OFFICE OF INSPECTOR GENERAL

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# SEMIANNUAL REPORT TO THE CONGRESS

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**September 1999**

# Operating Independently and Developing Partnerships

The National Science Foundation is managed by a Director and a Deputy Director and the agency receives broad-policy guidance and oversight from the National Science Board (the Board). The Office of Inspector General is organizationally independent from management and is committed to maintaining the independence contemplated by the Inspector General Act (IG Act). As contemplated by the IG Act, the Board, through its Audit and Oversight Committee, serves as the general supervisor of the IG. The Board and our office are particularly careful to respect our different roles under the IG Act. In particular, the Board's Audit and Oversight Committee discusses overall policy with, and provides general guidance for our office, but the Board does not select, direct, or terminate any audits or investigations. This organizational independence from management allows our office to operate independently for the purpose of ensuring that our analyses are objective, our access to information is unfettered, and our sources of information remain confidential. We consider our organizational and operational independence to be sufficient to meet standards of independence that are required to issue audit opinions under Government Auditing Standards and to operate as an independent law enforcement office within the meaning of applicable legal precedent.

Our fundamental objective is to add value by identifying mechanisms that improve the efficiency and integrity of agency operations. To do so, we consider it essential to work cooperatively with NSF management and to focus on prospective change. For this reason, we are expending significant effort to nurture a culture that fosters open and constructive dialogue with NSF managers on issues relating to efficiency and integrity in NSF's portfolio of operations. As part of our long-range planning of office activities, we also continue to conduct risk assessments and brief surveys in order to prioritize our work, focusing on prospective, substantive issues.

In this period, we significantly expanded our outreach and liaison programs. Our liaisons meet regularly with NSF staff to discuss our activities and areas of mutual interest. Along with this informal exchange of information, our liaisons regularly brief NSF divisions about our mission and goals, and obtain perspectives from division staff about our activities. Since our initiation of the outreach and liaison program a year ago, we have met with most of the NSF divisions. Within our office, liaisons regularly share information with the rest of our staff to ensure that our entire office can learn and benefit from these individualized interactions.

In addition to building partnerships through the outreach and liaison program, we participate in a number of national and regional professional meetings to learn about high-priority issues and find better ways to promote awareness and understanding about our efficiency and integrity activities. For example, we were selected to participate in a best practices forum, during the Association of Government Accountants' annual meeting. Together with NSF's Chief Financial Officer, we described why we consider NSF's Audit Coordination

Committee to be an effective tool that can ensure that the auditing process is constructive. We now regularly participate in NSF's Regional Grant Conferences, and in this way, we exchange information with organizations that receive NSF funding. We participated in two panels, one on audit issues for the future and the other on allegations of research misconduct, at the annual conference of the Society for Research Administrators. Our office hosted a meeting of the Federal Scientific Misconduct Officials Network to discuss scientific misconduct and research integrity issues. We also worked closely with NSF and other federal officials in developing the final version of the recently released uniform Federal Research Misconduct Policy.

We continue to work with NSF committees that assess and respond to management issues. Accordingly, we participate in several task forces charged to develop and implement NSF's strategic and performance plans, evaluate certain aspects of NSF's personnel system, assess risks associated with the use of electronic signatures, coordinate electronic submission issues, and assess security issues. By invitation, we have participated in orientation programs for new program officers in two NSF directorates and we regularly participate in NSF-wide, new employee orientation programs, and in conflict of interests briefings for all employees.

We believe that our outreach efforts enable us to develop the best possible product that can more readily effect improvement on behalf of NSF. For the purpose of improving the timely and effective processing of misconduct cases, we now regularly visit university officials in connection with the deferral of investigations in specific cases. Our partnerships with these universities and the reports we now receive for specific cases have improved because of these conversations. Similarly, for the purpose of improving the quality and utility of our audit reports, we regularly share our audit plans with NSF program officials for comment and suggestions, and we provide NSF officials with the opportunity to request reviews of specific awardees. In this way, we are better able to undertake reviews that are more meaningful to NSF managers and have the greatest potential to generate improvements in the economy and efficiency of NSF operations. Ongoing dialogue with NSF management about our auditing program also serves to increase awareness and understanding about the importance of fiscal and management controls throughout the Foundation's portfolio.

This Semiannual Report highlights several reviews that arose, in part, through our outreach efforts and from requests for assistance from NSF management. These highlights include our review of NSF's Science and Technology Centers, NSF's Engineering Research Centers, and certain aspects of the U.S. Antarctic Program. These reviews are tangible evidence that our partnership activities are producing meaningful results. Through our outreach and liaison programs, we are developing practical ways to implement strategic goals that enable us to refine and strengthen the positive effect our work can have on the National Science Foundation and the communities it serves.

# Proposed New Uniform Federal Policy on Research Misconduct is Consistent With NSF's Procedures

At the close of this reporting period, the Office of Science and Technology Policy (OSTP) issued a new, proposed policy on research misconduct for public comment. For several years, we worked closely with OSTP and other federal agencies to develop and refine the policy. Once finalized, the policy will be implemented by all federal agencies supporting research. This policy will not become final until OSTP and all affected agencies consider public comments and then issue their final policy or rule. Until the new policy is finalized, we must rely on the definition and procedures established under NSF's current misconduct regulation.

Consistent with NSF's current practice, the proposed policy emphasizes the need to defer investigations, in most cases to awardee institutions, separates investigation from adjudication, ensures confidential treatment for both complainants and subjects as the allegations are being resolved, and develops corrective actions that are in proportion to the seriousness of the misconduct. In order for there to be a misconduct finding under the proposed policy, the conduct in question must be a "significant departure from accepted practices of the scientific community for maintaining the integrity of the research record." This is consonant with NSF's current approach and is based on the principle that allegations of misconduct should be evaluated by comparing the conduct in question to the ethical standards established by the relevant scientific community.

The uniform policy is limited to misconduct "in proposing, performing, or reviewing research, or in reporting research results." Because OSTP focused exclusively on misconduct affecting the research record, the proposed policy explicitly states that agencies may adopt supplemental definitions and procedures to cover misconduct not affecting the research record. This provision is important for NSF because the Foundation does not only support scientific research, but also has a large investment in science and engineering education. In our view, it will be appropriate for NSF to adopt the proposed policy when it becomes final so long as the NSF also takes specific action so that it can continue to address allegations of misconduct associated with its education and research portfolios consistently.

Overall, we are pleased with the proposed policy because all federal agencies that have a research portfolio will now have a uniform process designed to reinforce the importance of integrity in the conduct of research. We stand ready to share our experiences and insights with other agencies as they begin to implement a structure and process to carry out this new responsibility. At NSF, the responsibility rests with scientists within this Office of Inspector General. As other agencies consider an appropriate structure, we believe that the NSF model should be carefully evaluated. Having scientists lead investigations is desirable because scientists are familiar with the ethical standards of the scientific community and can use this

familiarity to evaluate misconduct allegations. Locating scientists in an Office of Inspector General is desirable because of the Office's inherent familiarity with the principles and practices of fair and effective investigation, including mechanisms to ensure confidentiality, availability of subpoena power, and clean separation between investigative and adjudicative functions.

# Summary of Referrals to Agency Management for Adjudication

## Recommendation to Conclude Subject Fabricated Publications and Data

As part of its inquiry, a large, public university on the east coast requested from NSF information related to an allegation that a biologist misrepresented his publication record in his funded NSF proposal by listing as "in press" manuscripts that did not exist. We responded to the university's request for information and deferred our inquiry to it. The university concluded there was sufficient substance for an investigation, and we deferred our investigation pending completion of its efforts. During the university's investigation, it learned the subject's progress report for his previously funded NSF proposal also contained false statements about "in press" publications. The university concluded the subject's multiple misrepresentations of his publication record were misconduct in science.

During the university's investigation, we received an allegation of data fabrication against the subject. The university was unable to investigate this allegation because the subject moved to another university and took his laboratory records with him. We conducted our own investigation and requested the relevant laboratory notebooks from the subject. He provided us with a laboratory notebook that recorded the data obtained by a visiting scientist who conducted the experiments in the subject's laboratory. We asked an independent scientist to evaluate the data. He said the data in the subject's NSF proposal were not supported by data in the notebook and, based on the descriptions of the experiment in the proposal and notebook, some of the proposal data simply could not exist. We interviewed the visiting scientist, who confirmed he did not do the experiment described in the proposal and agreed that other data listed in the subject's proposal could not exist, even in theory. In our interview with the subject, he said that the data were provided to him by the visiting scientist and were recorded in another laboratory notebook he did not have; he said the visiting scientist stole the other notebook. We determined there was no independent evidence to support this assertion. Based on the existing notebook, the testimony of the visiting scientist and the subject, and the analysis by the independent scientist, we concluded the subject's explanations were not credible and that he fabricated the data.

As part of our investigation, we also examined the allegation that the subject misrepresented his publication record. We found additional false publication claims in the subject's funded NSF proposals. We agreed with the university's conclusion that his multiple false claims of "in press" publications were misconduct in science.

We recommended that NSF's Deputy Director find the subject committed misconduct in science when he misrepresented his publications and fabricated data in his proposals to NSF. We recommended that he send the subject a letter of reprimand, debar him for 1 year, and impose certification and assurance requirements for any NSF-supported project for 2 years after the debarment.

## Recommendation to Conclude PI Plagiarized in NSF Proposal

We received an allegation that a chemist at a mid-sized, northeast university plagiarized text from an NSF award into his proposal. In our inquiry, we determined that over 50 percent of the subject's proposal was identical to the award and concluded that there was sufficient substance to the allegation to warrant an investigation. We referred the matter to the subject's university, which told us its policy required that it conduct an inquiry first. The university's inquiry concluded there was enough evidence for an investigation. The university found the subject committed plagiarism egregious enough to constitute misconduct in science. The university denied the subject a raise and associated benefits, and it also required the subject to obtain assurances that any documents he submits to NSF are his original work or are otherwise properly cited.

Our review of the university's investigation report determined that it was fair, accurate, and thorough, and could be used in lieu of our own. We concurred with the university's finding. We recommended that NSF's Deputy Director: (1) find that the subject committed misconduct in science; (2) send him a letter of reprimand; (3) require for 3 years that he provide a certification that any documents he submits to NSF contain no plagiarized material; and (4) require a similar assurance from his department chair or dean. In response to our draft investigation report, the subject pointed out that his NSF awards were unusual in that they were used almost exclusively to support students or to buy equipment, and one of our recommendations would disproportionately hurt his students and his department. Instead of that recommendation, the subject proposed to teach a science ethics course at his university, and we recommended NSF work with the subject (and his chair) to refine and implement his plan.

## Recommendation to Conclude PI Plagiarized and Breached Confidential Peer Review

We received allegations that an associate professor of chemistry from a large southern university submitted an NSF proposal containing text and ideas plagiarized from another scientist's NSF proposal, which the subject received for confidential peer review. In our inquiry, we found approximately 22 lines of substantially similar text, formulas, and references in the experimental design and methods section. When we contacted the subject, he said he did not see his actions as inappropriate, but admitted that he was "influenced" by the proposal. We concluded that there was sufficient substance to the allegations, and we referred the investigation to the subject's university.

The university's investigation committee determined that essentially the same material appearing in the NSF proposal was used in several versions of a proposal that NIH eventually funded. The investigation committee reported that the subject acknowledged that he used material from the reviewed proposal, believing that the author would review his proposal, and he wanted to ensure that he presented the author's work correctly. The subject admitted paraphrasing parts of the reviewed proposal, but contended that the equations and the references were general knowledge in the field and therefore copying them did not constitute plagiarism. However, he was unable to provide an example in which anyone else in his field used this same material.

The investigation committee disagreed with the subject, and found that he committed misconduct in science. It recommended that the university prohibit the subject from submitting any proposals for a period of 1 year and for an additional year the subject and his department head should certify that all of the subject's proposals are "misconduct-free." In addition, it recommended the subject be prohibited from participating in peer review for 2 years and that he actively educate himself about misconduct in science.

The adjudicator for the university accepted the committee's recommendations and also decided to terminate the subject's NIH award and return the expended funds to NIH. The subject appealed the decision to impose the additional actions. The president of the university denied the subject's appeal.

After reviewing the university's investigation report, we agreed with the university's conclusion that the subject knowingly plagiarized from the reviewed proposal into his NIH proposal, and subsequently submitted the same plagiarized material in proposals to NSF and NIH. We also agreed that the subject's plagiarism was more serious because he misused confidential information he acquired by participating in NSF's peer review system. We recommended that NSF's Deputy Director: (1) find that the subject committed misconduct in science; (2) send him a letter of reprimand; (3) require for a period of 2 years that he provide a certification that any documents he submits to NSF contain no plagiarized material; (4) require a similar assurance from his Department Chair or Dean; and (5) prohibit him from participating as an NSF reviewer for the same period. We recommended that NSF coordinate its actions with the other affected federal funding agencies.

## Recommendations Concerning Ineffective Oversight of Biohazardous Materials

We were informed by officials at a mid-size, midwestern university that they had initiated an investigation against a faculty member with regard to his biohazardous research. The university concluded that the subject committed misconduct in science when he failed to (1) obtain proper authorization to receive biohazardous materials, (2) adhere to guidelines for their use, and (3) respond to university officials' requests for information or provide them with accurate information. Among the disciplinary actions it took against him were suspending him without pay and prohibiting him from conducting research or applying for

research funding. The subject disputed these conclusions and actions. After a full, factual hearing, an independent arbitrator decided that (1) the evidence did not support the first finding, and (2) the second act was not professional misconduct, but (3) he failed to provide prompt and clear information about his research. The arbitrator ordered the university to rescind the discipline and compensate the subject for pay and other benefits. He said that the university could issue the subject a written reprimand for his failure to provide information.

After reviewing the university's investigation report and the documents associated with the arbitrator's decision, as well as additional records we requested, we determined that an investigation by our office was necessary. We questioned actions by both the university and the subject.

For example, we learned that, while the subject had indicated on the internal university approval forms for his external proposals that the research involved recombinant DNA, approving officials did not ensure biosafety review of the proposals, despite being members of, or responsible for, the biosafety committee. Instead, an administrative employee arbitrarily filled in the required dates of approval on the forms—with dates that predated the subject's employment at the university.

Over the years, the subject submitted internal requests for funding that involved biohazardous materials. The committee chairman reviewing and funding these requests, who was a member of the biosafety committee, neither discussed these requests with the biosafety committee nor spoke with the subject about their content.

To obtain biohazardous materials, the subject made explicit promises and commitments to suppliers assuring them that university officials would exercise oversight over his research, even though he knew there was no functioning biosafety committee and therefore no effective oversight was possible at the university. He proceeded with his research without such oversight—indeed, although he accepted personal responsibility for the safe conduct of his research, he was out of the country while many of these biohazardous experiments were conducted.

University officials knew of their responsibility for providing informed approval and oversight regarding the use of biohazardous materials, but they neither took reasonable action to ensure it occurred nor did they take significant corrective action after these issues arose. The subject knew of his own responsibilities and also did not take reasonable action. However, because we found that there were no standards of practice at the university against which its or the subject's actions could be measured, we concluded these actions were not misconduct in science. If there had been reasonable, informed administrative controls that were intentionally ignored, we would have considered recommending findings of misconduct in science against the subject.

We recommended that NSF take significant action to ensure that the university not receive NSF awards involving the use of biohazardous materials until it demonstrates its

ability to provide responsible oversight. With regard to the subject, we recommended that NSF require that for all future NSF awards he provide information about his commitments and declare in each progress report to NSF that he has taken the necessary steps to ensure proper oversight of his research.

## Deputy Director Concludes PI Plagiarized in Two NSF Proposals

In our March 1999 Semiannual Report (page 17), we discussed our investigation into allegations that a professor of biology plagiarized over 90 percent of the text in two NSF proposals he submitted to different NSF directorates. The university investigation found that the subject's use of verbatim material from another scientist's NSF award in his two proposals constituted plagiarism. The university reprimanded the subject and required that he: (1) not submit federal or state proposals and not serve as a PI on federal or state awards for 3 years; (2) withdraw his pending NSF proposal; (3) certify to the originality of any external proposals for an additional 2 years; and (4) read materials and attend workshops/meetings on the topic of integrity in research. In light of the university's actions, we recommended that the Deputy Director affirm that the subject committed misconduct in science and send him a letter of reprimand, but take no further action. The Deputy Director took action consistent with our recommendations.

## Deputy Director Concludes Plagiarism in Education Proposal is Misconduct

In our September 1998 Semiannual Report (pages 16-17), we described a case in which a university found that an experienced PI and co-PI committed misconduct by plagiarizing the text of a proposal written by educators whose project they proposed to replicate. NSF agreed with our recommendation to find that the subjects committed misconduct in science and reprimand them. It rejected an appeal from one of the subjects, who argued that the other subject alone was responsible for the plagiarism.

## PI Appeals Deputy Director's Misconduct Finding

In our March 1999 Semiannual Report (page 19), we described the Deputy Director's decision that a biology professor's misrepresentations in his proposal were misconduct in science. NSF determined that the subject falsified his proposal by misrepresenting his research capabilities and the status of his research. The Deputy Director concluded his actions were misconduct in science and proposed significant action to protect the federal government's interests.

Consistent with NSF's misconduct-in-science regulation, the subject appealed the Deputy Director's decision to the Director. The Director said the subject's misrepresentations "materially affected NSF's decision to award [him] the substantial renewal grant he received."

She concluded that his appeal did not "raise new issues or provide additional information that was not previously addressed" and that his issues were "considered and addressed by the University, by the OIG, and by the Deputy Director." She therefore "affirmed the finding of misconduct in science." She did not modify the actions NSF proposed.

# Summary of Significant Cases Closed Without Recommendations for Findings of Misconduct

## Science Issues Intertwined with Allegation of Data Fabrication

We were informed of an allegation that a geographer at a large, public university in the southwest falsified data by adding material to his samples to pre-determine the results that would be obtained when independent testing facilities analyzed his samples. The subject's university also learned of the allegation and asked two scientists to attempt to duplicate the subject's results. We discussed the matter with the subject's university, agreed it would conduct an inquiry, and agreed to defer action pending completion of its inquiry. The university's adjudicator concluded there was sufficient substance to proceed to an investigation. We deferred our investigation to allow the university to complete its investigation.

The university's investigation committee commissioned independent tests on some of the subject's samples. The results of these tests indicated that some samples contained material that was anomalous because it is not known to be naturally occurring in the location where the samples were collected. The subject raised concerns about the chain of custody of the samples and suggested that some samples may have been inadvertently contaminated.

A scientist provided the committee with a comparison of the subject's results with known "control" data. This scientist's analysis showed remarkable agreement between the two sets of data, and he argued that such close agreement suggested that the subject inappropriately manipulated his samples so that those data would match the "control" data. In response to the committee's questions, the subject provided an analysis that showed substantially less agreement, and he suggested that the lack of uniformity was indicative of honest research efforts. The subject also provided the committee with scientific reasons why some of his data should show good agreement with the "control" data and others would not. The committee concluded that both the scientist's and the subject's representations of the data were inaccurate and there was ambiguity associated with the "control" data themselves. Ultimately, it concluded that there existed convincing scientific explanations for the agreements between the subject's data and the "control" data.

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# WHEN *are* DUPLICATE PUBLICATIONS PERMISSIBLE?

As part of an investigation that closed this period (page 25), we learned that many scientific communities do not have clearly articulated practices for determining what is a duplicate publication and under what conditions it is permissible. We conducted a literature review to identify publication expectation standards in the scientific and editorial communities. Our review showed that many journal editors have more clearly defined standards than scientific communities as to what is acceptable practice with duplicate publications, including proposed remedies and sanctions. We found it difficult to find articulated standards in scientific disciplines, although most scientists would probably agree that it is improper to republish and represent prior published research material as if it was primary or original work.

A duplicate publication, also referred to as self-plagiarism or redundant publication, is considered to be a published paper that substantially overlaps with an author's prior publication without reference to the original publication or editorial permission to republish. The meaning of substantial overlap is varied, with opinions ranging from 10 to 100 percent identical content.

Several recent studies estimate that duplicate publications may account for as much as 15 percent of all published papers.[1] Potential effects of duplicate publications include: wasting peer reviewers' time; adding unnecessary papers to an already extensive body of literature; overemphasizing the importance of findings; increasing the costs of publication for other scientists; and distorting the professional credentials of the author. One editor commented that readers of primary journals should be able to trust that what they are reading is original.[2] Another editor said duplicate publications could hinder effective communications between scientists, by placing an added burden on those who want to be informed, but end up wasting time by reading the same results and interpretations a second time.[3]

Our review shows that some scientists consider duplicate publications to be an issue only for papers that are republished in primary journals (peer reviewed and archival journals). In this view, monographs (invited short papers or conference proceedings) are excluded. Other scientists consider conference proceeding papers to be duplicate publications, if they represent original work and they are either peer reviewed or reflect a full published manuscript.

Journal editors take the issue of duplicate publications very seriously and provide specific instructions about what they consider acceptable practice. For example, many editors will not publish a duplicative paper unless: the authors obtain approval from both journals; target different audiences for the publications; and allow some period of time between the first and second publication. In addition, most editors require authors to clearly indicate in the second paper that the information has been published either entirely or partially in an earlier publication.

1. *American Medical Association, Manual of Style, page 98.*
2. *New England Journal of Medicine, Special Report: Uniform Requirements for Manuscripts to Biomedical Journals, 336: 310, January 23, 1997.*
3. *Philip H. Abelson, Science 218: 5, December 3, 1982*

Not surprisingly, journal editors recommend strong sanctions against authors who submit duplicate publications that are not accompanied by the appropriate notifications and/or permissions. For example, some editors recommend the circulation of a blacklist to other peer-reviewed journals identifying the offending authors; the retraction of duplicate publications from scientific databases; and/or the exclusion of these authors from publishing in a specific journal for a designated number of years. Editors also suggest more proactive approaches, such as educating authors about the negative effects of these practices, and mentoring and training for young researchers. Finally, some editors encourage decision-makers to restrict the number of publications considered for academic promotion or proposal competition. For instance, NSF limits PIs to a maximum of 10 publications in a proposal — five related to the research project and five unrelated, thereby emphasizing the quality of the publications over the quantity.

Our literature review shows that editors are actively establishing various criteria for acceptable duplicate publication. The scientific community, however, appears to have a broad range of publication practices and concepts. We are concerned about the potential effects of the apparent disjunction between the editorial and the scientific communities, especially on the efficiency and effectiveness of research reporting. NSF's definition of misconduct in science emphasizes that only those actions that seriously deviate from accepted practices within the relevant professional community are considered misconduct. We defer the investigation of allegations to awardee institutions who convene committees of experts to assess them. In the absence of clearly articulated standards or expectations within the scientific community about duplicative publications, our office and expert committees finds it difficult to assess the seriousness of such allegations. We have seen that accepted practices can vary across disciplines, and we encourage discussion within and among the scientific and editorial communities on this interesting issue. We offer our role as facilitators to track community opinions.

# MISCONDUCT INVESTIGATION FORWARDED *to the* DEPUTY DIRECTOR

## Researcher Admits to Fabricating Data

We received an allegation that a postdoctoral researcher at a Mid-Atlantic university admitted fabricating data generated under an NSF award. The chemist voluntarily revealed the fabrication to the Principal Investigator, a professor who was the head of the laboratory in which the researcher worked. We contacted the professor, who confirmed the allegation and told us that the researcher fabricated the data by adjusting the controls on an analytical device so that it generated an apparent signal even though no *bona fide* signal was present. In this way, the researcher fabricated nearly all of the data in a manuscript that he and the professor submitted for publication. The researcher planned to present these data at an upcoming meeting, and actually presented the first figure from the manuscript at an earlier conference.

Although the researcher had not been under suspicion, he apparently admitted to the fabrication because he was afraid his actions would be exposed at the upcoming meeting. The researcher explained to the professor that he fabricated the data because he felt pressure to obtain data for the project, which he thought was necessary for his job. Due to the seriousness of the conduct, the professor, with the support of his department chairman, immediately terminated the researcher's employment at the university, ending his support on the NSF award. We subsequently contacted the researcher, who confirmed the truth of the allegation of fabrication and explained that he deeply regretted his actions.

In our view, data fabrication, which corrupts the scientific record and goes to the heart of the scientific enterprise, is a very serious form of misconduct. The fabrication in this case involved not only a presentation at a national conference but also a manuscript and a planned presentation. However, the relative youth and inexperience of the researcher, who received his Ph.D. only one year before, and the voluntary admission before the data were published, mitigated the seriousness of the misconduct. Moreover, the researcher had already been discharged from employment. For these reasons, we recommended that NSF debar the subject for 1 year. We believe that a debarment of this length would be proportionate to the seriousness of the researcher's conduct, and would adequately protect the federal interest in the integrity of work conducted under federal awards.

# THREE FINDINGS *by the* DEPUTY DIRECTOR

## Plagiarism in Chemistry Proposal is Misconduct

In our September 1999 Semiannual Report (page 18), we described our investigation into allegations that an associate professor of chemistry at a southern university plagiarized materials obtained through NSF's peer review system, into one proposal submitted to NSF and two submitted to another federal agency. Consistent with our recommendations, the NSF Deputy Director made a finding of misconduct in science and prohibited the professor from participating in the NSF peer review process for 2 years. For the same period, he required the professor to certify, and his institution to assure, that any requests for NSF funding do not contain any plagiarized materials and that all source documents are properly cited.

## Chemist Plagiarized from NSF award

In our September 1999 Semiannual Report (page 18), we discussed the case of a chemist who plagiarized text from another PI's NSF award into his proposal. Consistent with our recommendation, NSF's Deputy Director concluded that he committed misconduct in science and sent the chemist a letter of reprimand. He required that for the next 3 years, the chemist submit a certification to us, that to the best of his knowledge, his documents contain no plagiarized material. He also required that the chemist ensure that an appropriate supervisory official provide an assurance that, to the best of his or her knowledge the chemist's work associated with any NSF-supported publication or submission to NSF contained no plagiarized material. Additionally, he agreed with the chemist's offer to teach a science ethics course and asked the chemist to provide documentation to us that students attended the course.

## Plagiarism in Engineering Proposals is Misconduct

In our March 1999 Semiannual Report (page 18), we described our investigation into allegations that an assistant professor of engineering at a midwestern university plagiarized text and a figure in three proposals submitted to NSF and two to another federal agency. Consistent with our recommendations, NSF's Deputy Director concluded that the professor committed misconduct in science and required the professor to certify, and his institution to assure, for a period of 3 years that any requests for NSF funding do not include any plagiarized material and that all source documents are properly cited.

# SIGNIFICANT ADMINISTRATIVE CASE ACTIVITY

## Duplicate Proposal Submission and Repeated Errors in *Current and Pending Support* Forms

We learned that a chemical engineering professor at a west coast institution submitted an NSF proposal that was nearly identical to a proposal he submitted to another agency, without making the required disclosures on the NSF proposal cover page or in the *Current and Pending Support* form. Neither proposal was funded. The professor told us that he had been under extreme time pressure, and did not examine these forms very thoroughly. In our view, the professor had not sufficiently explained the failure to disclose the largely identical proposal, so we deferred an inquiry to the professor's institution.

The preliminary investigating officer at the institution found that the professor relied on two administrative assistants to fill out his *Current and Pending Support* form and to complete the duplicate proposal box on the cover sheet. They prepared these forms based on previous grant applications and records that they maintained. Although the professor had an opportunity to change these forms, he failed to undertake a thorough review or institute a better tracking system. As a result, almost all of the 15 additional proposals examined had errors or omissions in the *Current and Pending Support* section. Although there was another set of duplicate submissions among these proposals, only one was funded. Accordingly, there was no issue of receipt of duplicate funding.

The preliminary investigating officer believed that the professor's actions were errors, that the individual errors were not committed knowingly, and that the professor was not trying to hide attempts to receive duplicate funding. However, the preliminary investigating officer concluded that the professor knowingly adopted a faulty procedure. Based on the report of the preliminary investigating officer, the Chancellor censured the professor, and required that for the next 3 years, all of the professor's proposals be certified by the Dean.

We agreed that the professor's procedure was unacceptable, but concluded he negligently submitted undisclosed duplicative proposals. The professor has apologized and undertaken to improve the accuracy of his submissions. Accordingly, we concluded that the Chancellor's actions were sufficient to protect the government's interest in ensuring that the professor's future *Current and Pending Support* sections are accurate and that duplicative proposals are not submitted without disclosure.

## Duplicate Publications Determined not to be Misconduct in Science

We discovered that an NSF-funded engineer at an eastern university published essentially identical manuscripts in two peer-reviewed journals. We later determined that he published eight sets of papers with similar overlaps, with one set including submissions to four different journals. We contacted the subject about the duplicate publications, and, because we found his explanation to be unsatisfactory, referred the investigation to his university.

The university's committee considered his alleged duplicate publications to exemplify two practices: (1) publishing as conference proceedings, materials that had previously been published in a refereed, archival journal; and (2) publishing as first-tier, archival, peer-reviewed journal papers, materials that were published previously in a similar quality journal. The committee members described his first practice as in "the fringe area of acceptable practice[s]." In contrast, they found the second practice went "beyond the acceptable standards of scientific practice within the [PI's] field." They found two sets of publications that exemplified this second practice.

Ultimately, the committee members concluded that the subject's actions did not rise to the level of misconduct in science. They described the subject's actions regarding the second group of publications as an "isolated lapse in judgement," and determined that he did not intentionally act to increase the number of his publications. They also concluded that his practice did not distort his publication record or the perception of his research abilities. While we disagreed with this specific conclusion, we also accepted the committee's overall view that his practices, although questionable, were not considered misconduct in science within his community.

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# ECIE/PCIE MISCONDUCT in RESEARCH WORKING GROUP

In our September 1999 Semiannual Report (page 16), we discussed the publication of the Office of Science and Technology Policy's (OSTP) Proposed Federal Policy on Research Misconduct in the Federal Register. We, along with NSF management, actively assisted in the development of OSTP's policy and procedures, and currently participate in the OSTP Implementation Group and a networking group of research misconduct officials from federal agencies. Both groups meet periodically to discuss implementation strategies. In anticipation of OSTP's final policy publication, the Executive Council on Integrity and Efficiency (ECIE) and the President's Council on Integrity and Efficiency (PCIE) of federal Inspectors General formed a working group to consider their role in conducting or providing oversight of research misconduct investigations. ECIE and PCIE formed the Misconduct in Research Working Group (MIR Working Group). The MIR Working Group is chaired by NSF's Inspector General and among its membership are representatives of Inspectors General from 22 federal agencies that fund research in all fields of science and engineering including research in economics, education, humanities, linguistics, medicine, and psychology. This group is charged with educating the IG community on research misconduct issues and developing a white paper describing investigative models including the scope and standards for such investigations.

During this reporting period, the MIR Working Group met three times. Members discussed and compared selected agency and IG approaches to resolving allegations of research misconduct, heard from the Office of Government Ethics on preventative models, and began drafting quality standards for misconduct investigations. Two group members are also members of OSTP's Implementation Group and briefed that Group on the function of the MIR Working Group. We have facilitated agency and IG contacts through the exchange of membership lists. The interactions between the MIR and Implementation Groups will assist in the development of policies that will serve the needs of both communities to ensure that investigations are conducted rigorously, fairly, and with consideration of all relevant policies.

# MISCONDUCT INVESTIGATIONS FORWARDED to the DEPUTY DIRECTOR

## Intellectual Theft in Five Federal Proposals

We received an allegation that an engineer employed by a small business in California plagiarized material from a published paper into his NSF Small Business Innovation Research (SBIR) proposal. The engineer's proposal used the central research idea, some text, and a figure from this paper, but did not attribute or distinguish the copied material from material original to his proposal.

The engineer characterized his omissions as a careless mistake. We obtained four additional proposals in which the engineer again failed to attribute the same idea, text, and figure. In all, the subject submitted five proposals to four federal agencies, including a second proposal to NSF, which made unattributed use of the material. In more than one instance, the subject designated these concepts in his proposal as proprietary to his company.

The president of the small business and an NSF program officer told us that the engineer's lack of attribution was a significant and serious problem. We concluded, based on a preponderance of the evidence, that the subject knowingly committed intellectual theft and plagiarism in connection with two NSF proposals and that overall he exhibited a pattern of such behavior.

We recommended that NSF take the following actions to protect the federal government's interest: 1) send a letter of reprimand to the subject informing him that NSF made a finding of misconduct in science against him; and 2) require for 3 years that the subject submit signed certifications along with his supervisor's assurances that all NSF proposals contain properly attributed ideas. We suggested that NSF coordinate its activities with the other federal agencies that received proposals from the engineer.

## Plagiarized Material in a Computer Science Proposal

We received an allegation that an assistant professor of computer science at an institution in Illinois plagiarized material from a conference proceeding into an NSF proposal. We identified approximately 50 lines of text and twographics in the assistant professor's proposal that were identical or substantially similar to material in the conference proceeding. The material appeared in the proposal without attribution or distinction. The assistant professor told us that he "copied and paraphrased" some of the material. We concluded that the allegation of plagiarism was substantive and deferred further investigation to the assistant professor's institution.

The institution made a finding of misconduct in science against the assistant professor. The Vice President and Chief Academic Officer sent him a letter of reprimand, notified him of the withdrawal of all of his pending proposals, institutionally debarred him for 1 year, required the review of any requests he intends to submit for external funding during the following year, and requested his participation in an ethics training program. The institution's investigation committee also suggested that the institution establish a formal program for training graduate students and faculty, in particular new and junior faculty, in matters of professional ethics.

We reviewed the committee's report and determined that the institution's investigation was fair, accurate, and thorough, and could be used in lieu of our own independent investigation. Based on the committee's report, we concluded that the assistant professor knowingly plagiarized material into his NSF proposal. We recommended that NSF find that the assistant professor committed misconduct in science, send him a letter of reprimand, and require for a period of 2 years that he submit certifications and his department provide assurances to OIG that any documents he submits to NSF contain no plagiarized material.

# ACTIONS by NSF in CONNECTION WITH two CASES

## Biologist Misrepresented Publications and Fabricated Data

In our September 1999 Semiannual Report (pages 17-18), we discussed the case of a biologist at a North Carolina university who misrepresented his publication record and included fabricated data in his funded NSF proposal. NSF's Deputy Director sent the biologist a letter of reprimand, concluding that he committed misconduct in science and debarred him for 1 year. NSF management also required that for the next 3 years the biologist submit certifications to the OIG in connection with any proposals or reports he submits to NSF that those documents do not violate NSF's Misconduct in Science and Engineering regulation. NSF also required that the scientist ensure that an appropriate supervisory official provide assurances that, to the best of his/her knowledge, any proposals and reports submitted to NSF by the biologist do not contain misrepresentations regarding the publication status of any manuscripts or any fabricated data.

## NSF Requires Certification of Biohazard Review

In our September 1999 Semiannual Report (page 19), we described our investigation into allegations of misconduct in science stemming from a biologist's alleged failure to notify his institution of his biohazardous research. Our investigation concluded that both the biologist and the institution, a university in Michigan, failed to provide reasonable oversight. We recommended that NSF take significant action to ensure the safe conduct of NSF-supported biohazardous research by the biologist and the institution. We also recommended that the university reimburse NSF $5,000 because a Research Experiences for Undergraduates (REU) supplement was not used to support an undergraduate student but rather was used to purchase general research supplies.

NSF agreed with our conclusions and took remedial action. For a period of 3 years, in connection with any NSF-supported biohazardous research, the biologist must submit copies to the NSF program supporting his research of any representations or promises he made to obtain biohazardous materials, and documentation of his efforts to comply with his commitments. The biologist is also required to submit documentation showing:

1) institutional approval and authorizations for his research;
2) that he posted notification in compliance with relevant regulations and policies that biohazardous research is being conducted in his laboratories; and
3) that individuals are notified of the hazards associated with that research.

For the same period, the institution is required to submit supporting documentation with any NSF proposal that involves biohazardous research to specifically document its review and approval of that research. Finally, the institution is required to reimburse NSF for the REU supplement funds.

# SIGNIFICANT ADMINISTRATIVE CASE ACTIVITY

## Awardee's Responsibility for Specimen-Collection Permits

In our March 2000 Semiannual Report (page 30), we described the joint efforts of NSF's Directorate of Biological Sciences (BIO) and our office to clarify awardee obligations associated with specimen-related research. Obtaining the proper permits for collecting specimens can be time consuming and confusing; however, the permits are variously designed to protect endangered species, natural resources, flora or fauna, and ensure respect for genetic resources, or cultural heritage. In response to the joint recommendations of BIO and OIG, NSF's Division of Grants and Agreements (DGA) promptly developed special language to be included in all award letters for projects involving specimen collection activity. The new language states:

> The awardee shall ensure that award activities carried on both inside and outside the U.S. are coordinated, as necessary, with appropriate Government authorities, and that appropriate licenses, permits or approvals are obtained prior to undertaking proposed activities. . . . [The PI] shall provide a summary in each annual progress report and in the . . . final report, of all permits, licenses or other necessary approvals associated with specimen collection.

DGA has incorporated the language into recent award letters and briefed the NSF divisions that are affected most. It is also developing internal guidance to ensure that DGA staff notify awardees of their permit-related responsibilities to help ensure that specimens collected by NSF-funded PIs are handled in accordance with applicable laws.

During this period, we inquired into an allegation that a Principal Investigator (PI) failed to obtain the necessary collecting permits for the removal of nonendangered specimens from national and state parks. We learned that the PI had obtained a permit for collection from national forest land, but only oral permission from the state parks. The administrators of the state parks told us oral permission is not sufficient and the PI should have obtained written permits. We asked the PI and his university's Authorized Organizational Representative (AOR) if the PI's collection was in accordance with university policy, and further suggested that they contact the various parks to determine an appropriate resolution of the matter.

The PI and AOR told us the university did not have an explicit policy regarding specimen collection. However, the AOR said the university administration would meet to consider modifications to its Research Policy Manual on this topic. The PI contacted the various parks explaining what had happened and asked how he might rectify the situation. Because his specimens were not considered wildlife or an endangered species, the park administrators only requested to know how many specimens he collected and where he collected them. The PI explained that he is now fully aware of the permits he must obtain for future collections and assured us he will obtain them.

## The Importance of Accurate Information in Proposals

We often receive allegations of improprieties associated with NSF proposals that raise concerns related to the accuracy of information in Current and Pending Support, Budget, and Biographical sections. While the information in these sections is not directly related to the proposed research, NSF's Program Officers rely on the accuracy of such information to make sound funding decisions. For example, Program Officers need accurate, current and pending support information to assess whether the PI can reasonably commit the required time and effort to the project, to check for similarly funded research, and to review requests for summer salary support on the PI's various awards. We typically refer these issues to NSF management. However, in egregious cases, we have pursued allegations that resulted in findings of misconduct by NSF (e.g., see page 26). Below, we discuss four recent cases that illustrate these issues and their resolution.

In one case, a PI allegedly misrepresented her role as the editor of a publication listed in an NSF proposal. We determined that the PI had editorial responsibility with regard to the publication, but another scientist had actually served as the editor. We concluded that the PI exaggerated her role when she cited herself as editor. We also concluded that the exaggeration was not a serious deviation from accepted practices because she had been involved in the editorial process. We contacted the PI to discuss our concerns about her citation, and she agreed to be more careful when citing her role in this effort in future proposals.

In another case, a PI allegedly misrepresented the access he would have to equipment critical to the success of an NSF award due to the expiration of a loan agreement, which the PI failed to disclose to NSF. In correspondence with us, the PI stated that he decided not to return the equipment on schedule and could replace it if necessary. At our suggestion, the Program Officer explicitly informed the PI and the institution's AOR of NSF's expectations regarding the PI's continued access to such equipment.

In a third case, a Program Officer informed us that a PI allegedly failed to properly describe his current and pending support in two proposals simultaneously submitted to NSF. According to this division's practice, the handling of such compliance issues is delegated to Program Officers. The division administrator told us that both proposals were likely to be declined on scientific merit and the pursuant declination letter could include a reference to the importance of proper acknowledgement of current and pending support. The letter told the PI that a "failure to follow the GPG guidelines is grounds for rejecting a proposal without review." We recommended that he follow this course of action.

The last case is another example of a researcher's lack of attention to current and pending support requirements. NSF received two proposals from different universities under one program announcement. A Co-PI on both proposals failed to disclose his dual participation in both sets of his Current and Pending Forms. A Program Officer learned of this problem during a site visit and questioned the Co-PI about his involvement with each proposal. The Co-PI told the Program Officer that if the two proposals were funded he intended to integrate his responsibilities. Administrators at one of the universities were unaware of the Co-PI's proposed dual obligations. At a meeting between university representatives, the Co-PI, and NSF staff, one of the university's representatives ensured the researcher's commitments would be met by him or other faculty. The Program Officer was satisfied with this resolution.

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# Administrative Investigations

## Findings by the Deputy Director

### Fabrication of Research Data is Misconduct in Science

In our March 2000 Semiannual Report (page 19), we described the case of a chemist at a Delaware university who admitted to fabricating data under an NSF award. The chemist adjusted the controls on an analytical device so that it generated an apparent signal even though no *bona fide* signal was present. Consistent with our recommendations, NSF's Deputy Director concluded the chemist committed misconduct in science and debarred him for 1 year.

### NSF Concludes Principal Investigator Committed Misconduct in Science

In our September 2000 Semiannual Report (pages 24-25), we discussed the case of an engineer who used a model published by other scientists without appropriate citation as the basis for two proposals submitted to NSF under the Small Business Innovation Research (SBIR) program. In addition, the engineer's proposals contained text and a figure almost identical to text and a figure in the scientists' published paper. We determined the engineer used the published model and copied text and a figure into his NSF proposals, as well as in proposals submitted to other agencies. Consistent with our recommendation, NSF's Deputy Director sent the engineer a letter of reprimand stating that he committed misconduct in science by plagiarizing material from a published paper without attribution and without the authors' permission. The letter of reprimand also noted the engineer misrepresented that the model was first developed by his company, rather than by the original authors.

## Misconduct Investigations Forwarded to the Deputy Director

### Doctoral Candidate Falsified Data in Thesis

We received notification from a California university that it was investigating an allegation of misconduct involving the manipulation of experimental data by a chemistry graduate student working under an NSF award. The allegation originated when the graduate student voluntarily disclosed he removed outlying data points from the data graphs, created new data files, and altered an internal computer clock to obscure his manipulation of the data files. We concluded the allegation was substantive and deferred investigation to the institution. The graduate student cooperated fully with the institution's investigation committee which concluded the student was guilty of scientific misconduct. The student was formally reprimanded and required to revise and resubmit his doctoral dissertation to more accurately describe

how he had presented the data. The institution also delayed awarding the student's doctoral degree for one year.

We reviewed the committee's report and the actions of the institution and determined the investigation report was fair, accurate, and thorough, obviating the need for an independent OIG investigation. Based on the committee's report, we concluded that the graduate student committed misconduct in science when he intentionally manipulated his experimental data to enhance the graphical presentations. We recommended that NSF send a letter of reprimand to the graduate student informing him he has been found to have committed misconduct in science.

## Plagiarized Material in a Biological Science Proposal

We received an allegation that an assistant professor of biology at an institution in Washington plagiarized material from another scientist's NSF proposal into his portion of a collaborative NSF proposal, without attribution or distinction. We asked the assistant professor for an explanation of why the text in his proposal was identical or substantially similar to material in the source proposal. In response, the assistant professor stated that he had permission from the author, who was the assistant professor's former Ph.D. advisor, to "recycle" some of the material from the source proposal. We wrote to the author and asked for his recollection of the subject's interaction with the source proposal. He stated that he did not provide the subject with a copy of the source proposal or any information contained therein. Based on the subject's statements and the information supplied by the subject's former advisor, we concluded the allegation of plagiarism was substantive and deferred further investigation to the assistant professor's institution.

The institution's investigating committee identified text plagiarized from the source proposal. The institution concluded that the assistant professor committed misconduct in science and issued a letter of reprimand. In addition, the institution required certifications for a period of three years that any other proposals for external funding did not contain plagiarized materials, and it directed the assistant professor to instruct his students on the proper conduct of scientific research, with special attention to avoiding plagiarism.

We reviewed the institution's report and determined the institution's investigation was a fair, accurate, and thorough evaluation of the facts relevant to the allegation. Accordingly, we determined the committee's report could be used in lieu of our own independent investigation. Based on this report, we concluded the assistant professor acted with at least gross negligence in copying verbatim text from the source proposal into his working notes and subsequently copying verbatim text from those notes into his collaborative proposal without proper attribution of the original sources. We recommended that NSF find the assistant professor committed misconduct in science, send him a letter of reprimand, and require for a period of two years that he submit certifications and assurances to OIG that any documents he submits to NSF contain no plagiarized material.

# Significant Administrative Case Activity

## The Perils of Plagiarism

### Allegations of Inadequate Citations

We receive more allegations of plagiarism (verbatim plagiarism as well as intellectual theft) than any other type. Typically, intellectual theft, also known as plagiarism of ideas, cases contain little verbatim copying of material. Instead, complainants believe the subjects have inappropriately taken credit for a novel idea or technique without properly citing the original research. As examples, we discuss three cases we closed this period that involved alleged intellectual theft.

In one case, a reviewer believed the PI and the co-author of an NSF proposal presented ideas that were developed by another scientist as their own and failed to provide proper attribution. The reviewer provided a reference to the scientist's primary paper in which he believed the ideas for the research had been first described.

We consulted a researcher with expertise in the field, who thought the idea for the proposed research came from the scientist's primary paper, but noted the PI referenced one of the scientist's older papers in his proposal. We agreed with the researcher's view that the citation to the older paper did not make clear the extent to which the PI used the scientist's ideas and methodology in the propo..

The PI acknowledged that he and the co-author used the scientist's research as the starting point of their methodology, but he thought the scientist's work had been sufficiently cited. Although the PI told us he and his co-author could not have used the scientist's primary paper as their source because it was unpublished at the time of submission of the proposal, the scientist told us he recalled sending a preprint of his primary paper to the PI. The PI failed to satisfactorily explain the relationship between the ideas in his proposal and the scientist's proposal. It appeared he may have relied on a preprint of the scientist's primary paper before submitting his proposal. Therefore, we deferred further investigation to the PI's institution.

The institution's inquiry committee concluded there was insufficient substance to proceed with an investigation. The committee believed it was unclear which preprints the scientist sent the PI. It concluded that the reference to the older paper was an adequate citation to the scientist's research. However, it also felt that the PI's use of the scientist's ideas and text should have been more carefully acknowledged and that the PI's failure to do so was inappropriate scholarly conduct, although not misconduct in science. After reviewing the University's report and supplemental material from the PI, we agreed there was insufficient substance to proceed with further investigation.

In another case, a complainant wrote us to point out that a recent paper in a scientific journal, the authors of which acknowledged NSF support, described a phenomenon that was already described in his previously published, NSF-funded research. The complainant thought the authors' experiments were essentially identical to his. Even though the authors cited his papers, he thought the reference to his papers was not as forthright and significant as it should have been to describe the same research.

We asked an engineer with expertise in the area to evaluate the significance of the overlap and whether the authors' reference to the complainant's papers was reflective of its relevance to the complainant's research. The engineer agreed the two research projects were similar. However, the engineer thought the authors' paper took a more rigorous approach to the topic, and the reference to the complainant's papers was part of a serious comment indicating differences in results, and not one made in passing. The engineer thought it was now up to the engineering community to evaluate the merits of the two theories. We agreed that this repetition of experiments was part of the research process and did not represent intellectual theft.

In a third case, a reviewer alleged that the PI and co-PI on an NSF proposal plagiarized material from an unpublished manuscript she co-authored with two collaborators and did not appropriately cite her role in the development of a scientific apparatus. The reviewer also alleged that her request to use the apparatus in the collaborators' laboratories was refused, even though NSF had supported its development.

Although the proposal contained no citations to the reviewer's work, it stated that the apparatus was developed in one of the collaborator's laboratories, and it referenced a personal communication with one of the authors of the unpublished manuscript (and one of the reviewer's collaborators). Therefore, although the reviewer herself was not cited directly, there was a citation to the material from the unpublished manuscript. Accordingly, we concluded the PI had not plagiarized material in the proposal or misappropriated credit for himself or his co-PI related to the development of the apparatus. We concluded NSF had no jurisdiction over the alleged refusal of the collaborators to permit the reviewer to use the apparatus, because the collaborators did not receive direct NSF support for development of the apparatus.

## Allegations of Verbatim Copying without Credit

A PI was alleged to have plagiarized text, equations, tables, and figures from two published papers in two NSF proposals submitted to the Small Business Innovation Research (SBIR) program. The PI explained that one of the authors of both papers was formerly an employee of the company and was currently a consultant. The PI also stated that the author was explicitly referred to in the proposals as a participant in the proposed projects, had participated in the preparation of the proposals under the PI's supervision, and had given the PI permission to use the published materials. When a letter from the author confirmed the information provided by the PI, we

concluded that the PI's actions did not deviate from accepted practices. It is notable that unlike other NSF proposals, SBIR proposals do not provide for Co-Principal Investigators, a role that likely would have been assigned to the author, if this option had been available.

In the course of this inquiry, we asked the PI if he submitted an identical or similar version of either of these proposals to any other federal agency. The PI provided a copy of a National Aeronautics and Space Administration (NASA) proposal that was essentially identical to one of the NSF proposals in this inquiry. The NASA proposal was submitted one month after the PI's submission of the NSF proposal. The PI failed to indicate in the NASA proposal, as he is required to, that he submitted the same proposal to NSF. We referred this information to the NASA OIG.

Citations to and acknowledgement of original research are essential to researchers and, therefore, we take perceived and real failures of acknowledgement seriously. We continue to believe careful citation to the literature would prevent many minor allegations of verbatim plagiarism or theft of ideas from arising.

## Allegations of Misconduct in Science

A post-doctoral fellow alleged that an NSF-funded PI and his collaborator made false claims in support of his NSF award, violated animal regulations, misappropriated dissertation research results, refused to release research results, and retaliated against him for reporting these complaints to the PI's institution. We confirmed with the PI's institution that it was aware of these allegations, and we formally deferred inquiry of this case to the subject's institution.

The institution's inquiry committee did not find any substance to the allegations of falsified claims, violation of animal regulations, refusal to release research results, intellectual theft, or retaliation. We reviewed the report of the inquiry committee and concluded the inquiry was a fair, accurate, and thorough evaluation of the evidence. In the absence of substantive allegations of wrongdoing, we closed the inquiry.

## Conflicts of Interests at an NSF-Funded Engineering Research Center

In our September 2000 Semiannual Report (page 35), we discussed our limited review of conflict of interests (COI) issues at select NSF-funded Engineering Research Centers (ERCs). NSF requires all grantees with 50 or more employees to have in place financial COI policies to monitor financial interests of NSF-supported PIs. ERCs' policies are of particular importance because ERCs are expected to engage in substantial collaborations with private industry.

We received an allegation that a former PI at an ERC and the president of a small business, who were jointly supervising a graduate student, used the student's thesis work to promote the interests of the small business they owned jointly. We

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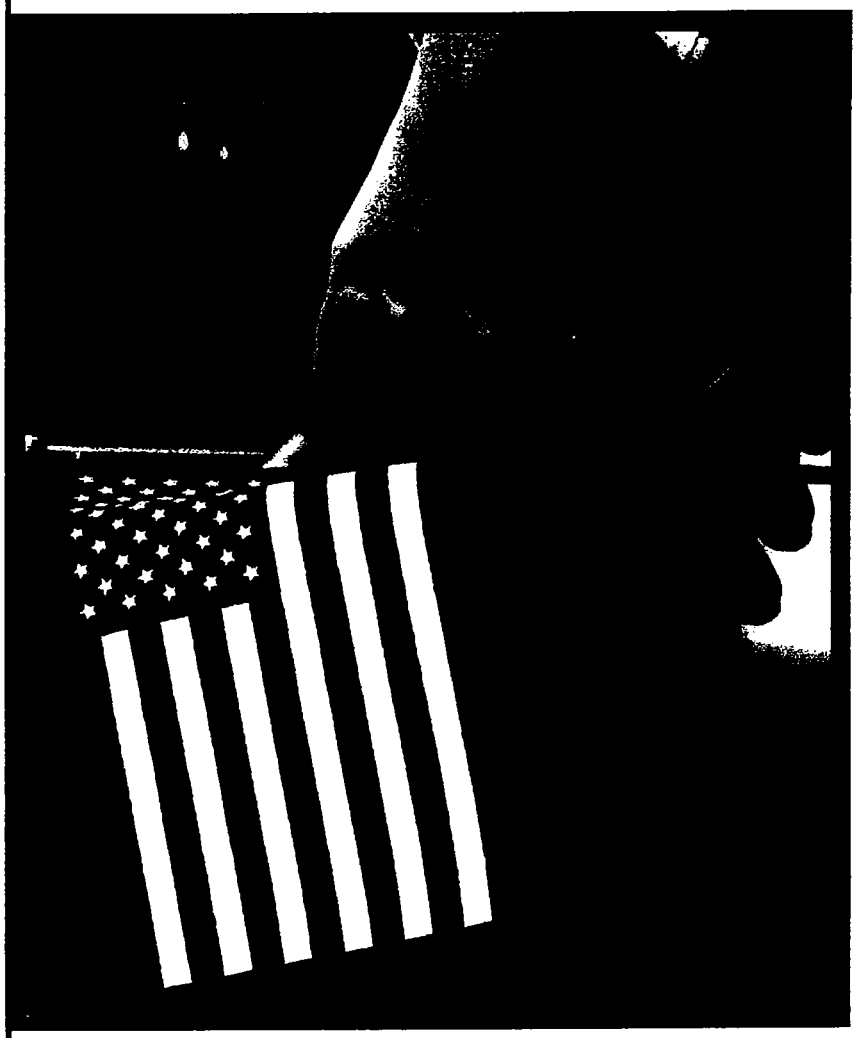
**September 2001**



**National Science Foundation**

**Office *of* Inspector General**

# Administrative Investigations

## Findings by the Deputy Director

### NSF Concludes Computer Scientist Committed Plagiarism

In our September 2000 Semiannual Report (page 25), we discussed the case of a computer scientist at an Illinois public institution who plagiarized material from a conference proceedings into an NSF proposal. Consistent with our recommendation, NSF's Deputy Director issued a finding of misconduct in science. NSF determined that the actions of the institution were adequate to protect the Federal Government's interests. The actions included a letter of reprimand, a one-year suspension from applying for external grants, withdrawal of all pending proposals, and ethics training, followed by a one-year requirement that the subject obtain approval of his department chair on new proposals. NSF also required the computer scientist to submit written certifications and assurances that any new documents submitted to NSF over a one-year period did not contain plagiarized material.

## Administrative Investigations Forwarded to the Deputy Director

### Plagiarized Material in a Small Business Innovation Research Proposal

We received an allegation that a scientist employed by a small business in Ohio plagiarized material into a proposal he submitted to NSF under the Small Business Innovation Research (SBIR) program. We asked the scientist for an explanation of why text and figures in his proposal were substantially identical to those in six source documents. In response, he stated that five of the documents were published by members of his former research group. He said that when he prepared the proposal, shortly after leaving the group, he felt as though he was still part of the group. He characterized his failure to properly cite the sixth document as careless.

The president of the small company provided us with copies of two other proposals submitted by the scientist to other Federal agencies within 2 months of the submission of the scientist's NSF proposal. We observed that the scientist copied

some of the same plagiarized text contained in his NSF proposal into these two proposals without attribution. We also noted that several figures in the two later proposals, which had been properly attributed in his NSF proposal, were not cited appropriately.

In our view, the subject's argument that he could use published material from his former research group without attribution is inconsistent with the ethical standards of the research community. We recommended that NSF find the scientist committed misconduct in science, send him a letter of reprimand, and require for a period of 2 years that he submit certifications and assurances to OIG that any documents he submits to NSF contain no plagiarized material.

## Failure to Comply with Certification Requirements

In our September 1997 (pp. 36-37) and March 1999 (p. 19) Semiannual Reports, we described a case in which the Deputy Director found that the subject committed misconduct in science when he seriously misrepresented his research progress and capabilities in proposals submitted to NSF. The Deputy Director required the subject to provide detailed certifications and assurances to OIG for 2 years starting in April 1999, in connection with any proposal or report submitted to NSF.

In the course of reviewing compliance with these requirements, we learned that the subject failed to provide certifications or assurances for a proposal he submitted in August 1999, for a request for Research Experiences for Undergraduates funding submitted in March 2000, and for a research proposal submitted in July 2000. In response to our request for explanation, the subject stated his belief that the certifications and assurances were only required for full research proposals, and then only after they were approved for funding. He also complained that nobody at NSF reminded him to provide the certifications and assurances.

We believe that the Deputy Director's letter informing the subject of the certification / assurance requirements was unambiguous. The most important purpose of a certification / assurance requirement is to compel the subject to exercise greater deliberation and care in the preparation of his proposals, and then to engage either his department chair or dean to evaluate the veracity of the substance of those

proposals. These actions can only be meaningful if they occur before the proposals are submitted. Moreover, NSF staff were not in a position to provide reminders: certifications and assurances are sent directly to OIG, a process that helps ensure that past findings of misconduct are separate from NSF's merit review process.

We concluded that the subject's repeated disregard of the certification / assurance requirement was—like the misconduct that precipitated its imposition—knowing and deliberate. We believe that the imposition of administrative actions less than debarment in serious misconduct cases, such as this one, can only be effective if they are enforced by the imposition of significant adverse consequences when they are breached. Accordingly, we recommended that NSF debar the subject for a period of 2 years.

# Significant Administrative Cases

## Working with NSF to Resolve Animal Care and Use Issues

We received an allegation that a small college in Wisconsin violated animal care and use regulations in the course of carrying out research under NSF awards. The college lacked a Multiple Project Assurance (MPA) or an Institutional Animal Care and Use Committee (IACUC), and had arranged for a nearby university to review and approve its animal care and use protocols. However, we found that the college's administration did not have a clear understanding of the IACUC approval and oversight process or Federal regulations governing animal care and use in research, resulting in several minor violations of the vertebrate animal care and use regulations. (There was no evidence that the violations resulted in harm to the animals.)

This situation was brought to the attention of our office by the NSF program director of the managing program. After reviewing documents from both institutions, we determined that on-site inspections, required by NIH guidelines, had never been performed. We then met with NSF management, including NSF's animal care and use representative, to discuss the best course of action to assist the college in attaining compliance.

NSF's animal care and use representative briefed college officials on the rules and regulations governing animal care and use. Concurrently, NSF suspended the use of animals under the grant for 30 days while the college convened its own IACUC and conducted a facilities inspection. The results of these corrective actions were

sent to the NSF animal care and use representative and our office. Upon NSF's approval of the IACUC-approved animal care protocol, the IACUC membership and proceedings, and the inspection report, the animal activity under the grant was reinstated.

OIG conducted a follow-up visit to the institution, where we interviewed several faculty members and inspected the research facility. We found no deficiencies and concluded that the institution was in compliance with Federal animal care regulations.

## University Finds Complainant Guilty of Misconduct

Although the majority of misconduct allegations are made in good faith, complainants sometimes make bad faith allegations. One such case recently occurred at a Texas public university.

The university had conducted an inquiry and concluded that an apparent instance of plagiarism required investigation. Because the subjects' work had been supported by NSF, the university notified us. The inquiry found that two publications by different authors—the subjects and complainant, respectively—contained substantially similar text and data. The authors of both publications maintained that they had collected the data, carried out the analysis, and written the articles themselves.

The university investigated and found that the data collection, analysis, and prose in dispute were the original work of the subjects. It found that the complainant had misappropriated the subjects' work and then accused them of plagiarizing her. The university decided to terminate the complainant's employment.

We reviewed the university report and determined its conclusion, that the subjects had not committed misconduct, was well supported by the evidence. Because none of the complainant's actions occurred in conjunction with NSF proposed or funded activities, we lacked jurisdiction over them and did not evaluate the report's conclusions regarding them.

## PI Fails to Disclose and Distinguish Between Virtually Identical Proposals

We received an allegation that a proposal, submitted to the NSF Small Business Innovation Research (SBIR) program by the president of a small company in New Hampshire, was virtually identical to a funded proposal he submitted 2 months earlier to another Federal agency. The NSF proposal cover sheet asks "Is this proposal being

submitted to another Federal agency"? In this case the president answered "No" to that question.

The president asserted the two proposals were significantly different, and he provided us with a detailed explanation of the differences in the experiments presented in the NSF proposal and the proposal funded by the other Federal agency. However, the president also admitted that the NSF proposal, which was not funded, did not adequately address the technical details associated with these differences.

We asked an expert to compare the proposals and review the president's explanation. She concluded the two proposals were virtually identical in organization, content, and task descriptions and contained identical tables, figures, and narrative with a few exceptions. She also explained that the few differences in the NSF proposal were consistent with the president's explanation, although the president had not done an adequate job of emphasizing the technical specifications of the NSF proposal.

We concluded the president was careless in the preparation of the NSF proposal, both in failing to disclose the prior submission of the same proposal to another agency and in failing to adequately describe the proposed research. We wrote to the president strongly recommending he be more thorough and careful in future submissions of proposals to Federal agencies to avoid similar allegations. We determined his conduct did not warrant our recommending further action by NSF. We described similar cases in previous years (see Semiannual Reports: March 1998, p. 21; September 1999, p. 26; March 2000, p. 24; September 2000, p. 28), and always urge scientists participating in the SBIR program to accurately inform NSF when they are submitting the same proposal to different Federal agencies.

## Graduate Student Alleges Theft of Ideas by Advisor

We received an allegation from a graduate student at a university in Washington, D.C., that his faculty advisor stole the student's research work. The student also alleged that the advisor did not provide him with appropriate compensation for work he performed for an NSF-supported project. Since the university had already initiated an inquiry into the student's complaints, we deferred our inquiry and requested a copy of its inquiry report when completed.

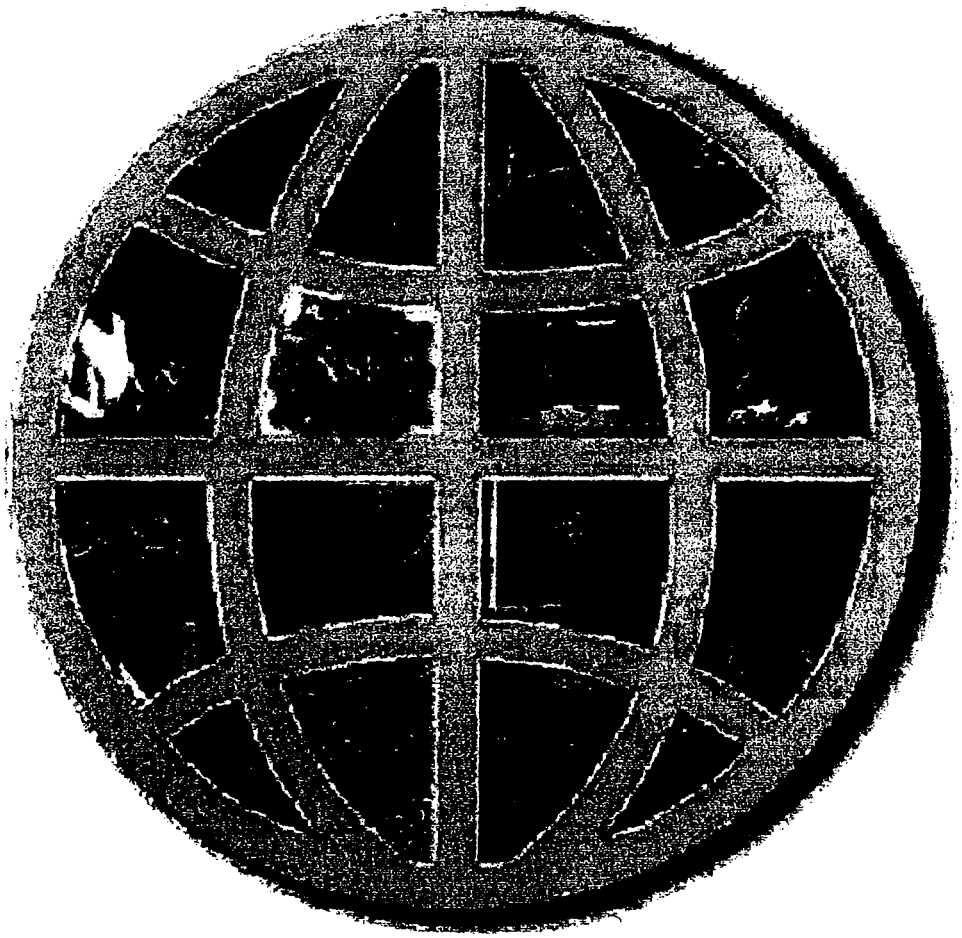
The university inquiry committee determined that the faculty advisor had submitted two papers to conference proceedings which contained research work of the student, both listing the student and the advisor as co-authors. The student believed that publication of his dissertation research would prevent him from receiving the Ph.D. In fact, the Department expected each student to publish a paper prior to the completion of the dissertation as partial fulfillment of the degree. The student

also thought that if the acknowledgment section in a paper stated that NSF support was involved, he should receive money from that grant for work on the project. The committee noted that the student's education was supported from the institution's funds, not NSF. The committee explained to the student that acknowledgment of NSF support in a paper did not mean he received compensation.

The committee subsequently determined that the allegations were without substance. As a result of the inquiry, the institution increased its efforts to inform graduate students about issues related to common practices and misconduct in science. We concurred with the university's findings and closed our inquiry.

# Semiannual Report to the Congress

## March 2002



**National Science Foundation**
**Office of Inspector General**

# Administrative Investigations

*NSF Issues Revised Research Misconduct Policy*

The Office of Science and Technology Policy (O$TP) issued a final Federal research misconduct policy on December 6, 2000 in 65 FR 76260-76264 (see March

2001 Semiannual Report, p. 39). This policy defines research misconduct, provides guidelines for responding to allegations, and directs Federal agencies that support or conduct research to implement the policy. To facilitate implementation of the policy government-wide, we are continuing to work with OSTP's Interagency Research Misconduct Policy Implementation Group. We have also worked closely with NSF, providing numerous recommendations as the agency drafted its new misconduct regulation. NSF's final rule was published in 67 FR 11936-11939 on March 18, 2002, and is effective April 17, 2002.

Our office has continued to lead the IG community in the effort to implement the Federal Policy on Research Misconduct. Through the PCIE/ECIE Misconduct in Research Working Group, we have made presentations to the IG community and have assisted individual OIGs in implementing the new policy. At the next Working Group meeting, we will focus on techniques for resolving cases that commingle fraud and research misconduct allegations and develop a plan for evaluating agency investigative efforts.

### *Misconduct in Science Findings by the Deputy Director*

**Plagiarism Cited in 2 Findings of Misconduct in Science.** In our March 2001 Semiannual Report (p. 27), we discussed the case of a biologist at a Washington institution who plagiarized material from another scientist's proposal. Consistent with our recommendations, NSF's Deputy Director issued a finding of misconduct in science. The Deputy Director reprimanded the biologist and imposed a two-year certification requirement. During this period, the biologist must certify to OIG that any documents he submits to NSF contains no plagiarized material.

In our September 2001 Semiannual Report (p. 34), we discussed the case of a scientist employed by a small business in Ohio who plagiarized material for a Small Business Innovation Research (SBIR) proposal. Consistent with our recommendations, NSF's Deputy Director issued a finding of misconduct in science. The Deputy Director reprimanded the scientist and imposed a one-year certification requirement.

**Falsification of Data Leads to Delay in Doctoral Degree.** In our March 2001 Semiannual Report (p. 26), we discussed the case of a chemistry doctoral candidate at an California state university who falsified data in research supported by NSF. The university placed a letter of reprimand in the chemist's student file, directed him to revise and resubmit his thesis, and delayed the award of his doctoral degree by one year. Consistent with our recommendations, NSF's Deputy Director issued a finding of misconduct in science and sent the chemist a letter of reprimand.

## *Significant Administrative Cases*

University Requirement Inconsistent with Human Subject Protections. We received a complaint that a southwestern university required doctoral candidates to complete the Survey of Earned Doctorates (SED) prior to scheduling a dissertation defense. The SED is a research instrument sponsored by NSF and five other Federal agencies to which the Common Rule for the protection of human subjects applies (45 CFR part 690). As required by the informed consent clause of this policy, instructions for the SED clearly state that the survey is voluntary and that failure to complete the survey will not result in any adverse consequences. Any institutional requirement to complete the survey would contradict the SED instructions and violate the Common Rule.

We contacted the institution to request an explanation. According to the institution, the mandatory requirement appeared to be a long-standing policy that had gone unnoticed and unchanged because no student had previously complained. The institution consulted with their legal office and promptly changed their policy so that graduate students are no longer required to complete the survey. Because the SED has a very high response rate, we intend to determine whether other universities' long-standing policies, though well-intended, may be in violation of the Common Rule.

Professor Barred from Seeking Funds Due to Careless Proposal Preparation. We received multiple allegations of misconduct in science against two chemistry professors at a Florida public university. In a proposal submitted to NSF, the chemists allegedly plagiarized material, fabricated biographical sketches, and made false statements concerning the activities of a research center. We determined that there was sufficient substance to the allegation to warrant an investigation and deferred to the institution's request to conduct its own.

The university's investigation committee determined that the NSF proposal was derived from a declined proposal submitted to another agency in 1991. Because one of the chemists was a co-PI on that proposal, the committee judged that the chemist had the right to reuse the text. The committee further determined that the two questioned biographical sketches were constructed without the knowledge of the affected researchers from information on their faculty webpages. Although the committee found this action to be poor scholarly procedure, the fact that the two researchers did not feel harmed by this action mitigated the circumstance. Finally, the committee determined that the "current research activity" section of the NSF proposal had been copied from the 1991 proposal without being updated. Overall, the university investigation committee found these actions to be extremely poor practice but determined that they fell short of misconduct in science.

The university committee forwarded their report to us and to the university Provost. The Provost sanctioned the two professors for poor scholarly conduct. He sent a letter of reprimand to both professors and directed that neither be allowed to submit research proposals to outside agencies for a period of one year. We reviewed the university report and concurred with its conclusions. We also found that the Provost's actions were reasonable and justifiable within the university's misconduct in science regulations. These actions adequately protected the interests of the Federal Government. We therefore closed this case and intend to take no further action.

**False Assurances Lead to Suspension of Grant Funds.** In our September 2001 Semiannual Report (pp. 36-37), we described animal welfare issues at a small college in Wisconsin. This case was resolved when the college agreed to establish an Institutional Animal Care and Use Committee to oversee projects that use animals. In a second case involving another Wisconsin institution, we determined that a public university received an NSF award based on a false assurance that the proposed vertebrate animal experiments had been reviewed and approved by its Institutional Animal Care and Use Committee. During the course of our review, NSF suspended funding for the vertebrate animal research in the award and ceased processing the proposal. NSF worked with the institution to develop a Special Project Assurance and ultimately lifted its suspension of funding for the research and funded the proposal.

Based on the false assurances provided by the institution, we recommend that for the next three years, NSF require the institution to provide a statement with each submitted proposal that it has a formal mechanism for ensuring compliance with relevant Federal regulations, and that trained faculty and staff are responsible for the administration and conduct of Federal grants. Additionally, we recommend that the institution be required to provide annual reports describing actions it has taken in connection with the vertebrate animal research supported by NSF, its efforts to ensure compliance with the requirements of NSF's Grant Policy Manual and Grant General Conditions, the results of any state or Federal inspection of its facilities, and its responses to any recommendations made in connection with those inspections.

**Fabrication Inquiry Underscores Need for Accurate Record Keeping.** We received an allegation that a biologist at an Ohio university fabricated experimental results in a proposal submitted to NIH and an updated proposal submitted to NSF. We contacted the university, who requested that we defer our inquiry while they conducted their own. The biologist testified before the committee that on the basis of verbal communication with a student in his lab, he mistakenly believed that a certain experiment had been conducted and had incorporated a statement to that effect in his proposal materials. The committee found no evidence to contradict this account. In particular, the student's laboratory notebook (a word processing file) was incomplete and did not provide reliable evidence of events in the laboratory. The committee concluded that the evidence was insufficient to sustain the allegation of fabrication. After receiving the committee's report, we undertook our own forensic

linguistic analysis of the student's lab notebook. This analysis indicated that critical entries were missing and that other entries had been edited months after the events. We accepted the university's report and concurred with its conclusion.

In our notification to the biologist, we brought to his attention a relevant case with a different outcome, described in our September 1997 (pp. 36-37) and March 1999 (p. 19) Semiannual Reports. In that case, a scientist claimed that in making certain statements in his proposal, he had relied on oral communications with a graduate student in his lab. He admitted that he took no steps to verify the accuracy of his understanding of the experimental results. The university's investigation committee found that reliance on oral communication of results was not acceptable scientific practice. One outcome of this case was a finding of misconduct in science. Although this was a more complex case with multiple issues, such cases underline the importance of good research and mentoring practices in the laboratory, including scrupulous record keeping.

# Other Investigative Activities

*Researcher Fails to Report Program Income*

In our September 2001 Semiannual Report (pp. 42-43), we reported that a New Mexico professor of mechanical engineering failed to properly account for program income resulting from conference registration fees, improperly spent NSF funds, and violated conflict-of-interest rules in the planning and implementation of an NSF-sponsored conference. Because of the seriousness of the violations, and the fact that the university had failed to audit this award for nearly 3 years, we requested confirmation that every pending NSF proposal and award complied with all applicable Federal policies, particularly the provisions addressing competition and conflicts of interests in procurement. We also asked the university to identify any NSF proposals or awards that may generate program income.

In response to our concerns, the university sent a survey to all PIs requesting disclosure of any current or planned program income. The university's Contract and Grant Accounting Office also independently reviewed all NSF accounts to identify any accounts with the potential for generating program income, such as projects that involved conferences, participant travel and additional participant costs. The university notified us recently that its survey indicates no instances of program income not previously disclosed. As a result of these actions, the university has created a task force to produce a series of required program income training modules for NSF PIs, along with orientation programs for new NSF PIs.

# Semiannual Report to the Congress

**September 2002**

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use by members of the public who wish to provide a link to an NSF website or to acknowledge NSF assistance," but the professor's use of the logo was not consistent with this permission.

The professor also used the logos of the Department of Justice (DOJ) and Department of the Treasury. He asserted that he had entered into a contract with Treasury to represent them in carrying out his investigation at NSF's request, and in coordination with the NSF OIG as well as DOJ. We advised the professor that there are Federal statutes prohibiting the use of government seals/logos to misrepresent government affiliation. Although he was prohibited from using NSF's seal/logo to falsely present himself as affiliated with NSF, he was otherwise free to use the seal/logo if it was made clear that he was not affiliated with NSF and otherwise complied with applicable law.

When the professor made no substantive change to the misrepresentations on his website, we referred the matter to the DOJ which contacted the company that hosted the professor's website. After reviewing the misrepresentations on the website and consulting its own content policy, the company closed it down

# Administrative Investigations

## *Plagiarism Allegations*

NSF's regulation on Research Misconduct, 45 C.F.R. part 689, states that plagiarism is "the appropriation of another person's ideas, processes, results or words without giving appropriate credit." Allegations of plagiarism (both verbatim plagiarism and intellectual theft) consistently appear as the category of administrative allegations we most frequently receive. Approximately 40 percent of the allegations of research misconduct received by our office involve plagiarism¾17 percent verbatim plagiarism and 23 percent intellectual theft. Verbatim plagiarism refers to the unattributed use of another person's words, while intellectual theft relates to appropriation of another person's *ideas* and/or *processes*, without giving credit.

## *Significant Verbatim Plagiarism Allegations on the Rise*

In verbatim plagiarism cases, subjects have inappropriately used text originally appearing in textbooks, journal articles, conference proceedings, scientific proposals, electronic media or other sources. Using text authored by others is appropriate when it is quoted, indented or otherwise highlighted and attributed to the original author. However, when a writer fails to properly attribute the original author's text, s/he violates a basic tenet of the research community by passing the words and composition off as his/her own.

We receive these allegations from numerous sources, most frequently from NSF's merit reviewers. Peers who review proposals occasionally recognize unattributed text

as belonging to another author. Sometimes they recognize the plagiarized text as their own. When the copied text originates from a previously submitted proposal, the plagiarism violation is compounded by a possible breach of the confidential merit peer review process.

The seriousness of the case depends upon the amount of text copied. Less serious cases involve the copying of small amounts of text, and after receiving an adequate explanation from the subject, generally culminate with a letter reminding them that NSF expects all aspects of a proposal to maintain the highest scholarly standards. In more serious cases, if the subject is unable to adequately explain the copied text, the allegation is referred to the subject's institution for investigation.

During this semiannual period, our office received several substantive verbatim plagiarism allegations. In addition to the cases discussed elsewhere in this report, our office referred verbatim plagiarism allegations to four institutions for investigation. We received an investigation report from one of those institutions and expect the rest to be completed, during the next semiannual period.

Once we receive an institution's report, we review it for fairness and accuracy and determine whether additional investigative work is required to ascertain whether research misconduct (RM) occurred. If the evidence shows that the subject's actions met the definition of RM, we assess whether those actions represent a significant departure from the accepted practice of the subject's research community, and whether they were committed with the requisite level of intent. If these last two criteria are met by a preponderance of the evidence, then our office recommends a finding of research misconduct to NSF and suggests appropriate action.

## *Evaluation of Allegations of Intellectual Theft*

> *Most scientists are rigorously honest about what really matters to them, like the accurate reporting of procedures or data. In other areas, however, such as disputes over priority or credit, they tend to behave like the ordinary mortals they are. Scientists are not disinterested truth seekers; they are more like players in an intense, winner-take-all competition for scientific prestige and the resources that follow from that prestige.*
>
> *David Goodstein, "Scientific Misconduct" Academe, January-February 2002*

Understandably, scientists take umbrage when their ideas are unfairly appropriated. Ideas are the currency of progress and evolution in scientific research, and their theft can seem as serious to the author as financial theft. Intellectual theft allegations are significantly more difficult to substantiate than verbatim plagiarism, it is unusual to find that an idea has been copied exactly as it originally appeared.

Intellectual theft allegations often originate from scientists who feel they did not receive appropriate attribution for their ideas in the publications of others or

whose collaborations have dissolved. In these cases, we have found that the prevalent view in the research community is that, once scientists share their ideas publicly, others are free to use them as long as they provide proper attribution. Resolving allegations of intellectual theft from broken collaborations can be particularly problematic because the dispute among the participants involves shared nonpublic ideas. It can be extremely difficult, if not impossible to determine from whom the idea originated.

In our initial evaluation of alleged intellectual theft, we assess the originality of the allegedly copied idea in any source documents, compare the idea as presented in the source and destination documents to determine similarity, and assess the likelihood that the idea was taken from the source documents. To date we have encountered only two cases of proven intellectual theft, as discussed in our March 1992 (pp. 19-20), September 2000 (pp. 24-25), and March 2001 (pg. 26) Semiannual Reports. However, we have encountered numerous cases that range from simple misunderstandings to questionable or unprofessional conduct. We encourage scientists to craft intellectual property rights agreements at the outset of their collaborative efforts. These agreements are most effective when they allocate existing intellectual property ownership among the collaborators and create clear understandings among them about the use of joint intellectual property arising during their collaboration.

With the rise of electronic information dissemination, including the publication of papers (as both preprints and in final published form) on the web, cyber-conferences, and the ephemeral nature of many electronic information resources, the opportunities for plagiarism have increased dramatically. The expanding nature of information sharing and the modes for sharing have not dulled the offense people feel when they believe their words or ideas have been misappropriated. As the national publicity afforded to high-profile cases of scientific misconduct raises the public's awareness of the problem, it also highlights the importance of having carefully crafted collaboration agreements in place, and the value of initiating thorough and objective inquiries into allegations.

## *Plagiarism in Collaborative Proposals Submitted to Joint Agency Program*

We investigated two plagiarism cases that we determined were substantive but could not be referred for investigation. In both cases, our initial inquiry revealed that the proposals in question were the product of U.S.-foreign collaborations submitted to a multi-agency program administered by the Department of State. For those proposals assigned to NSF for review, the U.S. collaborators resubmitted the proposals through their universities using NSF's FastLane electronic system. As a result, each proposal initially appeared to have been submitted and primarily authored by a U.S. researcher. Both U.S. researchers told us that their foreign collaborators had authored the proposals. In each case, the foreign collaborators admitted to us that they had

copied the material in question without attribution or distinction.

We met with NSF and Department of State officials to discuss preventive measures for such U.S.-foreign collaborative programs. Because the announcement for the joint agency program failed to articulate any scholarly or scientific standards for proposals, we suggested that the announcement be enhanced along the lines of NSF's Grant Proposal Guide. The interagency board issued a new announcement that incorporates specific language about plagiarism.

## *Actions by the Deputy Director*

**Scientist Fails to Observe NSF Requirements Imposed Following Misconduct Finding.** In our September 1997 (pp. 36-37) and March 1999 (p. 19) Semiannual Reports, we described a case in which the Deputy Director found that the subject committed misconduct in science when he seriously misrepresented his research progress and capabilities in proposals submitted to NSF. The Deputy Director required the subject to provide detailed certifications and assurances to OIG for two years starting in April 1999, in connection with any proposal or report submitted to NSF. However in our September 2001 Semiannual Report (pp. 35-36) we reported that the subject repeatedly failed to provide the certifications or assurances that he was required to submit, and that the omissions were knowing and deliberate. Because administrative actions less than debarment in serious misconduct cases can only be effective if they are enforced by significant adverse consequences when they are breached, we recommended that NSF debar the professor for a period of two years.

NSF's Deputy Director issued a Notice of Proposed Debarment to the professor, and counsel for the professor submitted a response objecting to the proposed debarment. The professor and NSF resolved the matter with a settlement agreement that required the professor to provide detailed certifications and assurances in connection with any research proposals or reports he submits to NSF until October 25, 2003. The settlement agreement also stipulated that any breach of the certification and assurance requirements will constitute a material breach of the agreement, warranting debarment under NSF's debarment regulation.

## *Significant Administrative Cases*

**Verbatim Use of Project Management Text from Others' Proposals.** Two cases were closed involving Research Experiences for Undergraduates (REU) proposals, each of which included about three pages of material allegedly copied, verbatim, from an earlier successful REU proposal written by other authors. The allegedly copied materials described procedures to track student progress and success with the project.

Neither proposal distinguished the allegedly copied materials, included citations to the source document, nor contained an acknowledgement for permission to use the materials. At the same time, the biographical sketches in the proposals suggested

that each PI had some prior working relationship with the source document's authors. The PIs provided information to us showing their participation in the development of the source document, which we independently confirmed.

Although these two cases were resolved quickly and confidentially, the question of the appropriate use of common (boilerplate) text has come to our attention before. In three other cases (SA citations) the PIs did not have permission for their extensive unattributed use of text authored by others. In each of these cases, NSF concluded that the PIs committed research misconduct. NSF debarred two and imposed certification and assurance requirements on the third. In resolving these cases we learned that either the institution or the original authors had a practice of sharing these sections with other PIs at their own, or other institutions. This practice raises issues, such as when, if ever, is it appropriate for PIs to use these types of materials without citation; what role should grantees play in overseeing the management sections of proposals; and what, if anything, should NSF do to change the expectations in the project management section of these types of proposals. Institutional or departmental policies that articulate acceptable practices for using and sharing "boilerplate" text would ensure that authors understand the authorized uses of boilerplate text they authored and may therefore reduce the number of allegations.

**University Violates Cost Sharing Requirements.** We received an allegation that a northeastern university committed fraud by repeatedly using Federal money as a source for matching funds under a Young Investigator grant. This Young Investigator grant consists of an annual base award of $25,000 plus up to $37,000 of additional funds per year on a dollar-for-dollar match of funds from eligible sources. Under the requirements applicable to this grant, funds from other federal agencies were not eligible as a source for matching. We conducted an investigation into the fraud allegations and concluded that although Federal funds were used as a match, there was sufficient evidence to suggest that the institution did not act with fraudulent intent. A concurrent audit report confirmed our conclusion concerning cost sharing. We referred the matter to the Cost Analysis and Audit Resolution Branch of NSF's Contracts, Policy and Oversight (CPO) Division for review and resolution. CPO concluded that the university should repay $53,900, and CPO is in the process of recovering these funds.

# OFFICE OF
# INSPECTOR GENERAL

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# SEMIANNUAL REPORT
# TO
# THE CONGRESS

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**September 2003**

# Administrative Investigations

## Reports Forwarded to the Deputy Director

### *PI Takes Ideas for NSF Proposal From Another PI's Proposal*

We received an allegation that a proposal submitted to NSF contained more than a page of text and associated ideas plagiarized from a confidential research proposal submitted by other scientists to another agency. After confirming that the PI had received the research proposal for merit review prior to his submission of the NSF proposal, we wrote separately to the PI and co-PI requesting explanations. Only the PI responded, admitting that he received the research proposal for review and accepting full responsibility for the copied text. The PI said he developed the ideas, working closely with one of the research proposal's authors. He opined that, because he suggested one of the research proposal's authors as a reviewer for his

NSF proposal, he clearly did not plagiarize intentionally. We determined that the allegation had substance and referred it to the university for investigation.

The university committee interviewed the PI, the co-PI, several experts, and one of the research proposal's authors. It exonerated the co-PI from any culpability, but found that the PI knowingly copied the language and ideas from the research proposal, an act that was a significant departure from the standards within his field of study. The committee determined that the copied material represented the scientific core of the research proposal and the NSF proposal. It concluded that the PI's plagiarism from a confidential proposal was egregious, representing a threat to the integrity of science because (1) it is harder to discover plagiarism in confidential proposals; (2) it raises the possibility of individual gain with the use of new and novel ideas not yet in the published arena; and (3) it potentially discourages scientists from presenting their best ideas in confidential proposals.

The Committee concluded that the PI's plagiarism represented very serious research misconduct, aggravated by: (1) the PI's breach of the confidentiality in the peer review process clearly established by the agency; (2) the PI's "inability or unwillingness" to comprehend the serious nature of his misconduct; and (3) the PI's interception of OIG's initial Federal Express letter to the co-PI, which prevented the co-PI from responding to defend himself, potentially obstructing NSF's inquiry.

The university sanctioned the PI by: 1) reprimanding him; 2) withdrawing any federal government proposals he submitted as PI; 3) removing his name from pending federal government proposals on which he was a co-PI or key personnel; 4) prohibiting him from submitting proposals for funding to any federal agency for 2 years; 5) prohibiting him from acting as a peer reviewer for research proposals for any federal agency for 3 years; and 6) requiring him to certify and provide assurances for 3 years for any proposal he submits to any funding source that the work in the proposal is original to him or appropriately cited. Based on the evidence, we concurred with the university's findings and accepted its report.

We forwarded our report to NSF, recommending that NSF make a finding of research misconduct. Consistent with the university's actions, we recommended the PI receive a letter of reprimand, be debarred for 2 years from receiving any federal funds and, further, to protect the merit review process, we recommended that the PI be prohibited from reviewing any NSF proposals for 3 years. This case is awaiting the agency's adjudication.

## *Debarment Recommended in Plagiarism Case*

We received an allegation of multiple instances of plagiarized text in a collaborative proposal submitted to NSF. We contacted the PI (subject) who assumed responsibility for inclusion of the duplicated texts and conceded that the sources were not referenced in the proposal. He asserted that because the text was used for

general descriptions, he did not consider it necessary to cite the references. Further, because some of the plagiarized documents were authored by researchers with whom collaborations were proposed, he did not consider citations necessary in those cases either. Finally, he suggested that the rush to complete the proposal by the submission deadline might have changed his citation practices.

The subject assured us that there were no other instances of plagiarism in proposals he had previously submitted to NSF. However, after examining three other NSF proposals submitted by the subject, we found one that contained a substantial overlap in text with the original proposal examined, as well as additional instances of plagiarism. We determined that the allegation had substance and referred it to the university for investigation.

The subject suggested to the university's investigation committee that proposals should be held to different standards of scholarship than publications. The subject indicated that two proposals he submitted to other federal agencies included the same plagiarized text identified within the NSF proposals. After being confronted with the allegation of plagiarism in his NSF proposal, he contacted the program officers at those agencies to provide correct attributions for the text in those proposals.

The committee concluded that each instance of text duplication in the two NSF proposals constituted plagiarism. Moreover, it questioned whether the subject had a clear understanding of scholarship standards and practices of proper citation, citing the subject's contention that the plagiarized materials were in the introduction of the proposal and provided only background and context. The Committee unanimously concluded, by a preponderance of the evidence, that the collective actions of the subject represented a reckless disregard of standards of scholarship, and as such constituted research misconduct. The university's adjudicative actions in this case included non-renewal of the subject's contract with the university, prevention of submission of any grant proposals through the university, review of all research publications submitted by the subject, and a requirement for completion by the subject of a course on ethics and integrity in research.

We agreed with the university that the preponderance of the evidence demonstrates that the subject did introduce significant amounts of plagiarized text into each of two proposals submitted to NSF, and we accepted the report of the Committee in lieu of conducting our own investigation. We also concluded that his lack of proper citations departed significantly from the standards of scholarship and that the subject's intent was to save time and effort in proposal preparation. Based on extensive plagiarism in two proposals submitted by the subject to NSF, and similar plagiarism in proposals submitted to other federal agencies, we concluded that the plagiarism was part of a pattern of behavior by the subject.

We have forwarded our report to the agency and have recommended that NSF take the following actions as final disposition in this case: 1) a letter of reprimand informing the subject that NSF has made a finding of research misconduct against

him; 2) debarment of the subject from participation in federal programs for a period of one year from the date of an agency finding of research misconduct; and 3) certification and assurances for two years following the end of the debarment period, by a responsible official, that proposals submitted by the subject are free of plagiarism. This case is awaiting agency adjudication.

# Action by the Deputy Director

## *Computer Scientist Enters into Voluntary Exclusion Agreement*

In our March 2003 Semiannual Report (pp. 36-37), we described the case of an assistant professor of computer science (the subject) who incorporated text from another scientist's successful proposal into his own Faculty Early Career Development proposal. We referred the matter to the subject's university, which investigated and found that he had committed plagiarism constituting misconduct in science. The university Provost decided that the seriousness of the matter warranted termination and placed the subject on a one-year nonrenewable contract. Our further investigation uncovered plagiarism in four other NSF proposals as well as the subject's doctoral dissertation, demonstrating a substantial pattern of plagiarism warranting debarment. To protect the interests of NSF and the federal government, we recommended that the subject be debarred for three years and excluded from serving as an NSF reviewer, advisor, or consultant for a period of five years.

During this semiannual period, the subject completed his one-year teaching contract and took a faculty position outside the United States. NSF and the subject entered into a settlement agreement under which the subject voluntarily excludes himself from receiving U.S. federal assistance and benefits for a period of 18 months and is prohibited from serving as an NSF peer reviewer or panelist during that period. The subject also agreed to complete a two-week training session on citation methods and practices for scientific papers.

# Significant Administrative Cases

## *PI Plagiarizes Text From Published Article*

We received an allegation that an NSF proposal contained more than two paragraphs of background text plagiarized from a published paper. In response to our inquiry, the PI accepted full responsibility for the plagiarism, explaining that he failed to cite the text in his rush to complete the proposal. Because the allegation had substance, we referred it to the PI's university for investigation.

The university's investigative committee determined that the PI was solely responsible for the copied text. Further, it found that the PI committed self plagiarism when he copied background text from his earlier publication into a more recent publication without appropriately citing the source of the text. Finally, it concluded that the PI's copying of text in the NSF proposal and his self-plagiarism was a deviation from accepted practices and represented a pattern of behavior. The committee concluded that the PI committed misconduct in science, as defined by the university's policy.

The university's adjudicator accepted the committee's assessment that the PI plagiarized text from the paper into his NSF proposal, but disagreed that the PI's self-plagiarism constituted evidence of a pattern of behavior. The adjudicator concluded the PI committed misconduct in science, sent him a letter of reprimand, and required him to certify to university officials for 3 years that any proposal sent to an external funding agency contains no plagiarized material.

We accepted the university's evaluation and decision. Because the university did not find the PI's behavior to be a serious deviation from accepted practice within his community, the conduct did not meet the federal definition of research misconduct. We also believe the university's actions adequately protected the interests of the federal government. We discussed our decision with NSF and wrote to the PI warning him to be more vigilant in the future when he prepares material for proposals or publication.

**FINDING OF MISCONDUCT DEFINED**

**A finding of misconduct by NSF under the new research misconduct regulation requires proof by a preponderance of the evidence that: (1) there was a significant departure from accepted practices of the relevant research community; and (2) the research misconduct was committed intentionally, knowingly, or recklessly. We asked the university to readdress these points, since the language of its report was unclear. Because the alleged conduct occurred before April 17, 2002, NSF used the following definition of misconduct in science: "Fabrication, falsification, plagiarism, or other serious deviation from accepted practices in proposing, carrying out, or reporting results from activities funded by NSF." The university, using the prior definition of misconduct in science explained that (1) it considered the PI's act to be a deviation, but not a serious deviation, from accepted practice; and (2) it found that the PI acted knowingly.**

## *Failure to Comply with Certification Requirements*

In this period we addressed three matters involving significant failures to comply with administrative requirements imposed by NSF as a resolution of misconduct cases. In our September 2001 (pp. 35-36) and September 2002 Semiannual Reports (p. 42), we described a case in which a scientist failed to observe requirements imposed by NSF following a finding that he committed misconduct in science. That matter, in which the subject repeatedly and knowingly failed to provide the certifications or assurances that he was required to submit, was resolved with a settlement agreement that required the subject to provide detailed certifications and assurances in connection with any research proposals or reports he submits to NSF for an additional term.

We described a case in our March 2001 (p. 27) and March 2002 (p. 47) Semiannual Reports in which the Deputy Director found that the subject committed misconduct in science when he plagiarized material from another scientist's proposal. The Deputy Director required the subject to provide certifications to OIG for 2 years starting in October 2001, in connection with any proposal submitted to NSF. When we asked the subject why he failed to provide certifications for three proposals he submitted to NSF, both the subject and his dean stated their understanding that the subject's obligations were met by providing certifications *to the university* (a requirement that had been imposed on the subject by the university before NSF's action). The dean provided copies of certification pages that the subject apparently signed, dated, and provided to the university when the proposals were submitted, and on that basis we concluded that the university had acted in good faith.

In contrast, we concluded that the subject had not acted in good faith. The letter from NSF's Deputy Director, which was sent to the subject and not the university, was unambiguous in imposing a distinct requirement that certifications be provided to our office. However, we concluded that the subject's failure to comply with the requirement imposed on him by NSF's Deputy Director did not warrant additional action by NSF. We emphasized to the subject that he should take care to comply with the certification requirement with any proposals he submitted to NSF for the time remaining, and we subsequently received certifications from him during that period.

Finally, we discussed a case in our September 1999 (pp. 19-21) and September 2000 (p. 26) Semiannual Reports in which we concluded that an institution failed to provide reasonable oversight of biohazardous research. On the basis of our report, NSF concluded that "questions remain concerning the effectiveness of the oversight structure of biohazardous research" at the institution, and NSF required the institution to submit supporting documentation with any proposal sent to NSF relating to biohazardous research for a period of three years.

During the three-year period, which expired in July 2003, the institution submitted 16 proposals to NSF related to biohazardous research, but submitted the

required letters with only half of those. On the occasions when we contacted the institution about proposals submitted without the required letters, they were belatedly provided. We wrote to the institution, expressing our concern that its haphazard approach to compliance with the requirements imposed by NSF appeared to reflect continued indifference to biosafety. We sought the institution's views on why additional administrative requirements should not be imposed and asked it to suggest requirements that would result in actual compliance. The institution stated that it would audit its compliance with the requirements for biohazardous research, and also continue to provide documentation of compliance for another year. We determined that these additional steps were responsive to our concerns.