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TRAINING GRADUATE STUDENTS IN THE RESPONSIBLE CONDUCT OF RESEARCH

by Paul Tate, Dean in Residence, Council of Graduate Schools

Scientific fraud has a long and notorious history, and has always captured the public's imagination. Books and articles on the topic continue to appear, many of them gleefully documenting alleged indiscretions of Newton, Mendel, Pasteur, Millikan, Freud, and others.[1] Recent accusations have occurred even at elite institutions, and threaten the public's faith in science and the public funding that comes with it.

In 1981 Al Gore, Jr., a member of the House Committee on Science and Technology and chair of the subcommittee on investigations, held hearings about serious cases of scientific fraud that had recently come to light. The prominent scientists testifying before the committee essentially told its members that the committee was wasting its time. Scientific fraud happens rarely, the head of the NAS testified. "It occurs in a system that operates in an effective, democratic and self-correcting mode," he said. Exposure of fraud in such a system is inevitable.[2]

The picture of science presented to Gore's committee was that of an enterprise that is in no need of policing. Even before research is funded, it was claimed, peer review of proposals filters out work not meeting professional standards. And for research results to be published, they must undergo review by journal referees, which guarantees that only the most careful and the most significant work gets into print. Finally, the published results are then subject to verification by replication, as other scientists review and attempt to reproduce the work. In this manner, fraud or falsification or fabrication or plagiarism will inevitably come to light, and those who do commit such misdeeds, one of the testifying scientists said, have to be mentally unbalanced, because they know that they will eventually get caught.

This picture of science is of course highly idealized. It draws upon the time-honored theory that the truth of science is based upon its claims being both verifiable in principle and actually verified in practice (or else from its claims being both falsifiable in principle and not falsified after numerous serious attempts to falsify them). But this so-called truth of science does not accord very well with the conduct of science as it is practiced today, at least with regard to the way research is published and reviewed.

In medicine alone there are thousands of journals around the world, publishing thousands upon thousands of articles every year.[3] Scientists have neither the resources nor the motivation to verify any more than the smallest fraction of the findings in these articles. And even in cases where scientists do have resources and motivation for replicating previous experiments, the complete recipe for doing so may be absent in the published article, for a variety of reasons.

The amount of published research is increasing dramatically, partly because of the increasing numbers of scientists practicing today, but also because publications, in the academy at least, have become the currency of promotion, status, and even salary. Academic scientists thus feel an increasingly urgent need to publish their results, even before they have accumulated to the point of significance. And given the impossibility of regular scrutiny or replication of published research, the temptations for what is called "research misconduct" -- for example, "cooking" data to make results more eye-catching, or "forgetting" others' contributions to research findings -- have increased accordingly.

The government has responded to high-profile cases of research misconduct by setting up a watchdog operation to monitor funded activities. This watchdog operation has had several incarnations, but right now it resides in the Office of Research Integrity (ORI), a branch within the Department of Health and Human Services. The government has precisely defined the term "research misconduct" and established requirements for reporting cases to the ORI as well as procedures about how it should be dealt with on individual campuses.

The ORI has a team of very capable senior scientists who are essentially the sleuths who carefully document falsification and fabrication of data when credible allegations are made, something very time- and resource-intensive, especially since much scientific data is reported in visual form. But the amount of policing that can be done in one small government office is quite limited.

It should be no surprise, then, that the ORI has expanded its mission beyond the charge simply of policing government-funded research activities to that of educating researchers about what counts as misconduct, in order to try to keep misconduct from happening in the first place. The ORI has begun sponsoring seminars and workshops nationwide to educate the scientific commu-

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nity about the responsible conduct of research, and is currently funding projects to develop educational resources on the topic.

The need for education of scientists in RCR is not simply a consequence of the difficulty of policing research misconduct. "Research misconduct" is narrowly defined by the government, and is generally limited to falsification, fabrication, and plagiarism. But there are many more possible ethical lapses than these, and the absence of falsification, fabrication, or plagiarism does not in itself guarantee the highest standards of integrity in scientific research. Scientists need to be alert to ethical issues that arise, for example, in the attribution of authorship, in the avoidance of conflicts of interest, or in the management of research with human subjects or animals. They may also need to understand the moral dimensions of policy debates that occur in their fields.

For these and other reasons, CGS has taken the position that an aggressive strategy is needed for educating scientists and those they train about the professional norms and ethical standards that foster responsible conduct of research. Accordingly, CGS has entered into a contract with ORI to fund a set of pilot projects designed to institutionalize the training of behavioral and biomedical science graduate students in RCR. The contract allows for ten institutions to receive awards of $15,000 to generate and test innovative and strategic interventions and assessment strategies for promoting RCR. In June of 2004 CGS issued an RFP for the project and at the CGS Summer Workshop in Puerto Rico conducted a "technical workshop" on the RFP -- a discussion of the purposes of the project and an elaboration of the criteria for the awards -- aimed at institutions interested in submitting a proposal. Over seventy people attended, and many had to be turned back because of lack of seating and because of the fire code.

CGS was very pleased to have received thirty-five applications for the ten awards. On September 20, 2004, two CGS staff members, two representatives from ORI, plus one outside expert, selected the ten institutions to receive the awards. The remaining twenty-five applicants were designated "affiliates" in the program and have been invited to participate in listserv discussions and other activities in order to share with awardees and with each other their evolving knowledge of what works and does not work in RCR training.

The criteria for the awards require that graduate deans be the leverage points for the pilot projects. One of the central purposes of the CGS/ORI contract is to develop a cadre of graduate deans who can serve as leaders in RCR training on their campuses and among their peer institutions. CGS believes that graduate deans are in the best position on campus to work across disciplinary boundaries and to change the culture of graduate studies so that it includes a high awareness of the ethical dimensions of research.

The strategies planned in the ten pilot projects for integrating RCR training into institutional cultures are varied, but all have common elements. Many institutions will begin by incorporating RCR training into orientation sessions for beginning graduate students. Other institutions will develop instructional materials to use in existing courses, or to use in new courses devoted entirely to RCR, some of which will be discipline-specific, some general, some mandatory, and some elective. There will be "Ethics Days," "Ethics Issues of the Month" online, ethics discussion groups, special ethics seminars, special ethics presentations by outside speakers, ethics training sessions for mentors, etc. Many institutions will develop new survey instruments to measure the effectiveness of their strategies, or gather data using existing instruments such as the Defining Issues Test, a test used to measure levels of moral development. These various strategies are being tracked on a CGS-linked webpage that other institutions can follow in order to help them design projects appropriate to their own circumstances.

CGS will continue to sponsor sessions at national meetings on the RCR project, which will provide opportunities for awardees, affiliates, and other interested institutions to share their experiences and their strategies. The CGS RCR website will not only track the evolution of the project, but will link to online resources for RCR education and provide contact points for awardee institutions. The final outcome of the project will be a best practices monograph, which will draw upon the experiences of both the awardees and the affiliates, and which will be made available to the CGS membership.

[1]See, for example, Richard Lewontin, "Dishonesty in Science," *The New York Review of Books*, November 18, 2004, pp. 38-40 and Horace Freeland Judson, *The Great Betrayal: Fraud in Science* (Harcourt, Orlando, 2004).

[2]Quoted in William Broad and Nicholas Wade, *Betrayers of the Truth: Fraud and Deceit in the Halls of Science* (Simon and Schuster, New York, 1982), p. 12.

[3]Ibid., p. 53.

Institutions Receiving Awards:

Arizona State University
Duke University
Florida State University
New York Medical College
Old Dominion University
University of Kansas
University of Missouri-Columbia
University of New Hampshire
University of Rhode Island
University of Utah

Affiliate Institutions:

Boston College
Chicago School of Professional Psychology
Clemson University
Columbia University
Eastern Washington University
Florida International University
Fordham University
Hood College
Howard University
Michigan State University
Purdue University
San Diego State University
Towson State University
University of Arkansas
University of Arkansas-Little Rock
University of California-Davis
University of Hawaii-Manoa
University of Illinois-Urbana-Champaign
University of Maryland-Baltimore County
University of Massachusetts-Amherst
University of North Carolina
University of North Carolina-Charlotte
University of Wisconsin-Madison
Utah State University
Western Michigan University

Federal Relations Update

by Patricia H. McAllister, Director of Government Relations and Public Affairs

The 109th session of Congress has begun and the president's FY 2006 budget proposal was released on February 7. This article reviews those elements of the budget that are of interest to the graduate education community and provides an update on recent legislative initiatives, including reauthorization of the Higher Education Act, the Getting Results for Advanced Degrees (GRAD) Act and the Collaborative Opportunities to Mobilize and Promote Education, Technology, and Enterprise (COMPETE) Act. It also includes the latest good news we received about the extension of Visas Mantis Clearances for Students, Scholars and Certain Categories of Employees.

FY 06 Federal Budget

With a goal of reducing the federal deficit in half by 2009, the Administration's $2.5 trillion budget proposes to reduce in actual dollars non-defense and non-homeland security related domestic discretionary programs. Investments in research across agencies is very minimal and there is considerable concern in the academic community about the long-term dis-investment in research demonstrated in this budget. The National Institutes of Health (NIH) and the National Science Foundation (NSF) are the largest government institutions supporting academic research. NIH's budget calls for an increase of 0.7 percent to $28.85 billion and NSF's spending would rise by 2.4 percent to $5.605 billion. At NSF, graduate education traineeships and fellowships and the Experimental Program to Stimulate Competitive Research would each receive small increases of about $300,000 to $155 million and $94 million. However, a 12 percent cut in the agency's Education and Human Resources Directorate will mean that about 6,140 fewer undergraduate, graduate and postdoctoral students would be able to participate in its programs.

The Administration proposes widespread cuts in popular education programs. Forty-eight programs in the U.S. Department of Education are slated for elimination, including popular pre-collegiate programs such as GEAR UP, Perkins loans and Vocational Education. The TRIO Talent Search program would be cut by 56%. As has been widely reported in the press, the president has proposed an increase in the Pell program, specifically increasing the maximum award by $100 over five years, totaling $500 and bringing the maximum award to $4,550 at the end of the five years. Both the GAANN and Javits programs are level funded. See chart for programs of interest to graduate education.

Higher Education Act (HEA) Reauthorization

After little activity last year on reauthorization of the Higher Education Act, Congress is now gearing up to move the bill this year. Last year, the House introduced four separate bills that comprised its HEA package. Last week Congressmen Boehner (R-OH) and McKeon (R-CA) introduced H.R. 609 which incorporates several of last year's bills into one new piece of legislation. Committee Chair Boehner has noted that the "first mission of the Higher Education Act is to improve college access for low and middle-income students and that the law has drifted away from this purpose over the years." H.R. 609 includes the same language for Title VI on International and Foreign studies and Title VII on graduate programs as was proposed last year. Additional details on these provisions follow.

Title VII - GAANN and Javits

For the GAANN program, H.R. 609 includes language requiring the Secretary of Education to establish a priority for grants in order to prepare individuals for the professoriate who will train highly qualified elementary school teachers of math, science, special education and English as a Second Language. Fellowship funds may be granted to students for purposes of:

1) post-baccalaureate study related to teacher preparation and pedagogy in math and science for students who have completed a master's degree or are pursuing a doctorate in math and science;

2) post-baccalaureate study related to teacher preparation and pedagogy in special education and English language acquisition and academic proficiency for LEP individuals and;

3) for support of dissertation research in math, science, special education, or second language pedagogy and second language acquisition.

The existing statute does not specify areas of national need which are developed by the U.S. Department of Education and currently includes the disciplines of biology, chemistry, computer and information science, engineering, geological and related sciences, mathematics and physics.

Title VI - International Education

Title VI of the Act covers international and foreign language studies. Among other things, this title addresses the preparation of foreign service professionals including those seeking advanced degrees in International Relations. The bill deletes the word "masters" in this section and inserts the word "advanced." A new International Higher Education Advisory Board would be created to provide expertise in the area of national needs for proficiency in world regions, foreign languages, and international affairs. The advisory board would also make recommendations to promote the excellence of international education programs and to advise the Secretary and the Congress concerning needs for expertise in government, the private sector and education to enhance America's understanding of and engagement in the world.

New Study of Student Learning Outcomes and Public Accountability

To address the concern about accountability, H.R. 609 also requires the U.S. Secretary of Education to provide for the conduct of a study of stu-

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Appropriations in millions

	FY2005 Final	FY2006 Proposed
National Institutes of Health		
National Research Service Awards (NRSA)	762	764
National Science Foundation		
Integrative Graduate Education and Research Traineeships (IGERT)	24.5	24.6
Graduate Research Fellowships	88.47	88.57
Graduate Teaching Fellowships in K -12	41.73	41.83
Alliances for Graduate Education and the Professoriate	14.79	15
Louis Stokes Alliances for Minority Participation – LSAMP	35.02	35
Department of Education		
GAANN	30.4	30.4
Javits	9.8	9.8
Fulbright-Hays Doctoral Research Abroad	2.2	2.2
Foreign Language and Area Studies	29.2	28.2
Department of State		
Fulbright Grants for Graduate Study and Research Abroad	204	238
Environmental Protection Agency		
General fellowships	8.26	8.33
Department of Agriculture		
Graduate fellowship grants	3	4.5
NASA		
Higher ed program	71.4	39.4
Minority University Research and Education	92.8	86.1

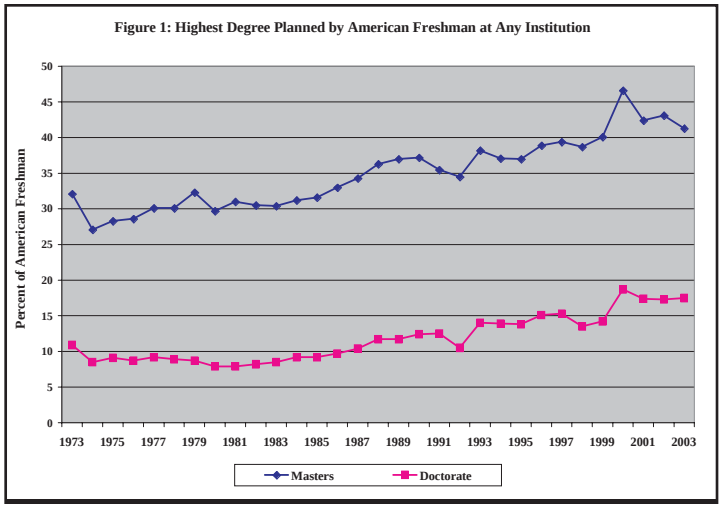
Data Sources: The American College Freshman and Graduate Education

by Heath Brown, Director of Research and Policy Analysis and Maria Doulis, Research Assistant

We often focus our attention in the Data Sources column on CGS research or other research that focuses on graduate education. For this issue of the *Communicator*, we chose to focus on the experience of students before graduate school. Recent reports on the college attendance and the attitudes of American college freshmen provide some critical information related to the graduate enterprise.

Post-Secondary Choices

It is clear that college access and opportunities are on the rise. Data from the Bureau of Labor Statistics indicate that approximately 64 percent of 200 high school graduates went on to enroll in college.[1] A large portion of the student-age population enrolled in college reveals the perceived value of a higher education. A recent report by *Public Agenda* examining the lives and attitudes of young adults ages 18 to 24 further documents this perception. The report finds that most young adults see the value of higher education, particularly in terms of attaining financial security, securing career advancement, and earning respect.



According to this report, 77 percent of young adults say they went to college because the job they want specifically requires a degree. When disaggregated by ethnic group -- African American, Hispanic, Asian American and White, non-Hispanic -- approximately 90 percent of respondents in all four ethnic groups believed that it would be "easier to move up in a company when you have a college degree" and that "in the long run, you will make more money if you have a college degree." In contrast, 70 percent of those without degrees said that their jobs were chosen by chance, and only 15 percent viewed their jobs as careers. Almost half of these individuals stated that they did not go to college because they could not afford it.[2]

American College Freshman

Another source of data on college students is UCLA's annual survey of American freshmen. For close to 40 years, the Cooperative Institutional Research Program at UCLA has conducted a nation-wide survey of American freshmen across colleges and universities in the United States. Each year, the researchers conduct a sample survey that asks college freshmen a wide-ranging array of questions about their working, studying and socializing behaviors; political, ideological and religious beliefs; opinions on current issues; and academic and non-academic pursuits. In 2003, 276,449 freshmen at 413 U.S. baccalaureate institutions responded to the survey.[3]

The longevity, comprehensiveness and consistency of the survey make it a valuable tool to higher education researchers, especially in assessing long-term and short-term trends. Recent short-term trends indicate increased political interest and volunteerism, decreased study time and religious involvement, and increased consideration of financial aid in choosing a college among college freshmen.

Findings on Interest in Graduate School

There are two questions in the American freshmen survey that deal with graduate education specifically. The first asks students to state the highest degree they plan to pursue at their freshman institution; the second asks for the highest degree planned at any institution. When assessed over time, the answers to these questions provide information for analyzing the changing demand for graduate education.

The 2003 report from the survey indicates that close to 60 percent of American college freshmen noted preparing themselves for graduate or professional school to be a very important reason for deciding to go to college. Over the past 30 years, the percentage of American freshmen planning to pursue master's degrees at any institution has steadily increased from 32 percent in 1973 to 41 percent in 2003 (See Figure 1). Similarly, the percentage of American freshmen planning to pursue doctoral degrees at any institution increased from 11 percent in 1973 to 18 percent in 2003.

Over time, differences between men and women in the intent to pursue graduate education have evaporated (See Table 1). In 1973, 30 percent of American freshman males, compared to 35 percent of American freshman females, planned to pursue a masters degree at any institution. By 2003, similar percentages of American freshmen males and females, 41 percent and 41.5 percent respectively, were planning to get a master's degree at any institution.

Table 1: Highest Degree Planned at Any Institution

	Men		Women	
	1973	2003	1973	2003
Master's	29.9%	41%	35%	41.5%
Doctorate	12.1%	17.2%	9.6%	17.7%

In the case of interest in doctoral degrees, similar gender equity now exists. Women have caught up to and surpassed men in intent to pursue a doctorate. Only 9.6 percent of American freshmen women, compared to 12.1 percent of men, expressed intent to obtain a doctoral degree at any institution in 1973. By 2003, 17.7 percent of American freshmen women stated the same intent, more than the 17.2 percent of men who planned to get a doctorate degree.

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dent learning outcomes and for purposes of assessing undergraduate postsecondary student learning, particularly as such practices relate to public accountability systems. Among other things the study must examine:

- The current status of institutional and state efforts to embed student learning assessments into state-level accountability frameworks.
- The extent to which there is commonality among educators and accrediting agencies on learning standards for the associates and bachelors degrees.
- The reliability, rigor and generalizability of available instruments to assess general education at the undergraduate level.
- Roles and responsibilities for public accountability.

The report is due to the respective House and Senate committees that oversee education two years after the HEA reauthorization is enacted.

Getting Results for Advanced Degrees (GRAD) Act

At present, the Senate has not introduced its HEA reauthorization bill, although several draft bills are under development that are likely to become part of the HEA. One bill under development by Senator Chris Dodd (D-CT) would establish the new Patsy T. Mink Fellowship Program to award fellowships to individuals from under-represented groups to pursue graduate study for the purpose of entering the professoriate. Similar legislation under development by Senator Edward Kennedy (D-MA) also contains the Patsy Mink proposal. CGS supports the goals of the proposed Patsy Mink Program to achieve more diversity within the professoriate, but has concerns about compliance provisions that would require fellowship recipients to repay some or all of the fellowship and/or be subject to a fine by the Secretary of Education if the student has not obtained a job in the professoriate within five years of receiving the doctorate or highest possible degree. CGS will be working with congressional offices to address this issue.

Collaborative Opportunities to Mobilize and Promote Education, Technology, and Enterprise (COMPETE) Act of 2004

This legislation is under development by Senator Norm Coleman (R-MN) and would establish a variety of incentives to stimulate and promote America's economic competitiveness. CGS has provided language to the senator's staff creating a matching grant program for institutions to provide financial assistance to students enrolled in graduate programs in the sciences, mathematics, technology and engineering or for purposes of supporting outreach and mentoring activities to increase the participation of under-represented groups in those fields. The bill should be introduced shortly.

Visas Mantis Clearance Extended for Students, Scholars, and Certain Categories of Employees

On Friday, February 11, the State Department announced that it had extended the validity of the Visas Mantis clearances for certain categories of visa applicants. This action comes after significant work on the part of CGS members and its partner organizations. At this year's Annual Meeting, this was a clear priority and the collective work of the graduate school community has paid off. For students and scholars on J-visas covered under the Visas Mantis, there is now a clearance lasting for the duration of study (or a maximum of four years) rather than the single-year clearance as in the past. You can read the press release at: www.dhs.gov.

The Vietnam Education Foundation (VEF): A Success Story

by Richard Wheeler, Dean, Graduate College, University of Illinois at Urbana-Champaign

Now, as we all worry about disturbances in channels that have long made research universities in the U.S. the preferred destination of talented international graduate students in science and engineering, there is great pleasure in telling a counter-story.

A key starting point for this story came when, in the last months of his presidency, Bill Clinton became the first American president to visit Hanoi. In his campus speech, Clinton envisioned a future of Vietnamese scholars obtaining an education in the U.S. and returning home to rebuild their country. In Washington, his vision was picked up by a group of legislators including John Kerry, John McCain, Chuck Hagel, and George Miller, who successfully introduced in Congress the Vietnam Education Foundation Act. Herbert M. Allison, Jr., agreed to serve as the VEF's first chairman.

The purpose of the VEF is to bring the U.S. and Vietnam closer through educational exchanges in science and technology. It recognizes the power of American doctoral education to transform and accelerate the development of a growing national economy, as it has done in a number of Asian nations. One core idea is to bring the most promising Vietnamese scholars to U.S. graduate schools for doctoral training that will contribute directly to the national capacity for science and technology in Vietnam.

In the fall of 2003, at the request of the VEF, the National Academies arranged for twenty top American scientists to visit Vietnam to identify promising scholars for the first group of VEF Fellows. Interest was high, and the VEF had already conducted a preliminary screening by the time the American scientists arrived. Few of those interviewed had taken the TOEFL, and none had taken the GRE. But the scientists sent by the National Academies realized quickly that they were talking with exceptionally talented candidates for these fellowships, and they believed deeply in the promise of this new program.

Once a group of eighty-plus fellows was identified, a new set of urgencies came into the picture. By the time VEF and the National Academies turned to Debra Stewart for advice and help, the application deadlines had passed for most of the doctoral programs in which these students had expressed interest, and the newly named VEF Fellows, most of whom had taken neither the TOEFL nor the GRE, had not even begun the application process. I believe I was the first graduate dean Debra called, because, thanks to the enthusiasm for this program of Richard Blahut, head of our Department of Electrical and Computer Engineering, and one of the National Academies scientists who traveled to Hanoi for student interviews, about a third of the students selected had indicated Illinois as their first choice.

Debra's call was followed by a visit to campus by Kien Pham, VEF Executive Director, and Dr. Ray Gamble, Director of the Fellowship Office at the National Academies. Over a dinner arranged by Blahut, Pham explained to a group of UIUC people both the story of how these fellows had been selected and the vision of the U.S.-Vietnam education partnership shaping the process.

The opportunity to contribute substan- continued on page 6

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tially to producing the next generation of educators and scientists in Vietnam, represented eloquently by Kien Pham, overrode ordinary admissions processes. Meetings were quickly arranged to enable Pham and Gamble to meet with departmental and administrative personnel who could receive and process the off-cycle applications of VEF Fellows. These applications came with carefully considered letters of reference from the U.S. scientists who had interviewed candidates in Hanoi, including their evaluation of the English skills of each VEF fellow.

Our admissions people made special arrangements for a group payment of application fees. Application files were reviewed by seven different departments in two colleges. Fellows were admitted conditionally, with the expectation that the GRE scores would confirm the evaluations conducted first in Hanoi by the National Academies scientists and then by our remobilized admissions committees. ETS made special arrangements to offer both the TOEFL and GRE exams off cycle; John Yopp, a senior administrator at ETS who spent 2004 as a senior scholar at CGS, worked with ETS staff to facilitate these arrangements. The director of our Intensive English Institute quickly made special arrangements to accommodate many of the students bound for Illinois and other universities for a summer program supported by VEF.

Within two weeks, seven departments at Illinois had offered admission to twenty-seven VEF fellows. The largest concentrations are in Blahut's ECE department (10) and in Computer Science (8), but there are also VEF Fellows in Civil and Environmental Engineering, Chemistry, Physics, Theoretical and Applied Mechanics, and Mechanical and Industrial Engineering. All told, eighty-three VEF Fellows enrolled in twenty-six American research universities in fall 2004. With special help from the American Embassy in Hanoi, VEF Fellows were able to receive their J-1 visas through an expedited process, in some instances just hours before their departure for the U.S.

More than half of the VEF Fellows had been teaching in universities in Vietnam. Two thirds of them are under twenty-five years old. Most of these Fellows were born after the war ended in 1975 and grew up in a Soviet-style system. Until the VEF was established, America was unreachable to them. As we enter into the graduate education of these young scholars who have had no prior contact with America, there is every indication that they will help to form enduring bridges between the U.S. and Vietnam, and between their home institutions and the universities at which they study in the U.S.

It took exceptional efforts at many levels to make this program happen in time for the 2004-05 academic year. But the urgency felt by the VEF when it decided to complete the selection process in 2003, by the National Academies when they quickly gathered up a distinguished group of scientists for the interviews in Hanoi, by ETS when it made special provisions for testing these students, by graduate programs at Illinois and twenty-five other American universities when they conducted special admissions processes for these students, and by the American Embassy at Hanoi when it agreed to expedite visa procedures -- this is an urgency warranted by the vision behind the establishment of the VEF. I am very proud of the efforts at the University of Illinois that enabled us to play a significant role in bringing the first group of VEF Fellows to America, and I am looking forward to the next one.

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Implications

The findings from all of these reports are consistent with CGS research that shows increasing enrollments at graduate institutions since 1986. Changes in the economy and workforce and increased earnings for higher degree holders have made graduate school an attractive -- perhaps even necessary -- option. Students beginning their freshman year of college are increasingly considering graduate school a part of their long-term plans. The notable growth in the interest in master's degree programs is also interesting and tracks with the trends in graduate enrollment that have seen large growth in the number of master's degrees conferred. All of these findings portend an increasingly important role for graduate schools in meeting the academic, career, and workforce goals of students across the country.

[1]Bureau of Labor Statistics, Available at: http://www.bls.gov/news.release/hsgec.nr0.htm.

[2]Johnson, Jean, Duffett, Ann. "Life After High School." *Public Agenda*. Available online at http://www.publicagenda.org/research/research_reports_details.cfm?list=31.

[3]Sax, L.J., Linholm, J.A., Astin, A.W., Korn, W.S, Saenz, V.B, Mahoney, K.M. (2003). *The American Freshman: National Norms for Fall 2003*. Los Angeles: Higher Education Research Institute, UCLA.

CGS/NSF Dean in Residence Update

by Carol B. Lynch, CGS/NSF Dean in Residence

As I finish up my six-month term as the CGS/NSF Dean in Residence, I'd like to provide an update from NSF.

There have been several new appointments at NSF to positions of importance to our graduate community. Tom Windham has been in his position of Senior Advisor to the Director for Science and Engineering Workforce since February 2004, but many of you may not yet know him. Before taking this position at NSF, Tom was Director of the SOARS (Significant Opportunities for Atmospheric Research and Science) program at NCAR in Boulder, CO, which provides research opportunities and ongoing mentoring to underrepresented students. We all can learn a lot from Tom's success with the SOARS program. Tom earned his Ph.D. at the University of Colorado, Boulder, and served for many years on our CU Graduate School Advisory Council, so he understands well the current issues in graduate education. In his role as an advisor to the Dean of the Graduate School at CU, he was an architect of our SMART (Summer Multicultural Access to Research Training) program. Tom's input was critical in making that program attractive to and effective for unrepresented students. Both SOARS and SMART attract students from all over the country, and a very large number of them go on to be successful in graduate school. The announcement of Tom's appointment to NSF can be found at www.nsf.gov/od/lpa/news/03/ma0353.htm. Tom shares his thoughts about his role here at NSF:

"I had the privilege of joining the National Science Foundation (NSF) in February 2004 as Senior Advisor for Science and Engineering Workforce and serve as the Foundation's focal point in addressing issues, strategies, and implementations centering on broadening participation of underrepresented groups in the science and engineering workforce. As a member of the Director's immediate staff, I participate in policy development and strategic planning, work to build broad organizational consensus, and represent NSF policies and plans, particularly those enabling participation of underrepresented groups in the science, STEM workforce.

Our broadening participation portfolio includes many outstanding programs that are having a strong impact on increasing the participation of underrepresented groups in the STEM fields at all educational levels. I believe one of our next steps is capturing data so that we can report the impacts of our targeted and non-targeted investments. These data will guide us as we 1) continue to refine programs and 2) disseminate widely the evidence for our policies, programs and activities. Our targeted and non-targeted efforts must yield a rapid acceleration of Ph.D.s in the STEM fields awarded to members of underrepresented groups. Academe, the private and public sectors must employ these Ph.D.s in positions commensurate with their training and abilities and insure access to opportunities that promote their careers."

Don Thompson, most recently Deputy Assistant Director of the Education and Human Resources Directorate (and before that the Director of the Division of Human Resource Development), was recently appointed Acting Assistant Director for EHR, after the departure of the former AD, Judith Ramaley, in December. He is known to some of us as the former Dean of the Graduate School at Western Michigan University. In reflecting upon his current role at NSF, Don says:

"The role of EHR is threefold: to develop the nation's next generation of scientists, to promote the continued integration of research and education, and to stimulate conversations and research that will 'mine' the educational talent of the United States. Ultimately, we want to encourage young people to choose careers in science and engineering fields. One way of accomplishing this goal is by partnering with graduate schools. As a past Vice President of Research and Dean of the Graduate School at Western Michigan University, I understand the vital role that our graduate schools play in broadening our educational reach. Your research, your ideas, and your students eventually touch all levels of the education spectrum. EHR's role is to help assist educators in the development and dissemination of ideas and practices that will promote a globally competitive Science and Engineering workforce. At NSF, EHR will adhere to our stated goals during my tenure as Acting Assistant Director, and we will continue to see your input as we attempt to engage students in science education."

In the Division of Graduate Education's Graduate Research Fellowship program, Earnestine Psalmonds has been joined by Famida Chowdhury, the new visiting scientist Program Director. Famida is an Associate Professor in the Department of Electrical and Computer Engineering at the University of Louisiana, Lafayette. She has experience with the GRF program as a panelist, and has also chaired the graduate fellowship committee at her university. She is especially interested in encouraging more women to enter careers in science and engineering. With Famida's appointment, DGE is finally fully staffed for all its programs.

As I prepare to leave this assignment, I am especially pleased that Claudia Mitchell-Kernan will fill out the rest of the year as the CGS/NSF Dean in Residence. Claudia is well known to all of us, as the Vice Chancellor for Graduate Studies and Dean of the Graduate Division at UCLA. She brings a wealth of experience and wisdom to the position. Regarding the DIR role, Claudia says:

"It is difficult to imagine that graduate education in the United States could have achieved its world class status without the federal-university partnership that evolved following World War II. I am honored to have been selected as the CGS/NSF Dean in Residence and regard the appointment as a valuable opportunity to enrich the exchange between the university community and the NSF, which has played such a vital role in funding academic research and training for more than a half century. I also look forward to contributing to projects of mutual interest to the graduate education community and the agency."

While NSF continues to attract and appoint outstanding, dedicated staff, the budget trends at the Foundation for the last two years have been worrisome. Although the administration's FY '06 budget request for NSF contains a small (2.4%) increase over the '05 levels, the '05 budget, enacted very late in the year, cut the total NSF budget by 1.9% from the FY '04 spending levels. In addition, the 2.4% increase for FY'06 includes a transfer of $48M (out of a total increase of $132M) to the office of Polar Programs for icebreaking activities that were formerly the responsibility of the U.S. Coast Guard. Of particular concern in the FY'06 budget is a 12% cut to the budget of the Education and Human Resources Directorate, which comes on top of the cut of 10.4 % to EHR in the FY'05 budget. Fortunately for the graduate education community, the budgets of the Divisions of Graduate Education and Human Resource Development are held harmless (see the Federal Relations Update in this issue), although funds for Research and Evaluation were cut drastically (over 40%). Detailed information on the FY'06 budget for NSF can be found at: www.nsf.gov/about/budget/fy2006/toc.htm.

There is, however, some potential good news for NSF coming out of the appropriations process in Congress. A significant reorganization of the House Appropriations

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Committee has been proposed by Chairman Lewis (R-CA). The proposed reduction in subcommittees from 13 to 10 should provide a more rational and efficient process for considering discretionary spending. The VA-HUD subcommittee, where NSF formerly resided, will be eliminated, and its programs spread to several other sub-committees. NSF, NASA and OSTP (Office of Science and Technology Policy) will be absorbed by the subcommittee on Science, State, Justice and Commerce. Note that "Science" gets top billing on this committee!

In addition to the programs in DGE and HRD with which you are familiar, I'd like to call your attention to some major new cross-cutting programs managed by the Directorate for Social, Behavioral and Economic Sciences (SBE) in which graduate deans may have an interest. (As an additional point of interest, the new AD for SBE, David Lightfoot, was the Graduate Dean for A&S at Georgetown University.) A priority area for NSF is Human and Social Dynamics. It has been suggested to me and to CGS that the complex issues facing institutions of higher education, especially graduate programs, with regard to the change in the dynamics of international students would be an important topic which one or more institutions might attempt to address under this program. Bonnie Thompson, in the Office of International Science and Engineering, is the NSF contact for the international component of this program.

Another cross-cutting program, Ethics Education in Science and Engineering, is especially focused on graduate students and graduate research, especially in interdisciplinary or inter-institutional contexts. This program complements the CGS activities in this area. The contact person is Rachelle Hollander.

Reflecting the recent reorganization of international activities, from a division of SBE to the Office of International Science and Engineering, several new programs designed to be more innovative and catalytic have been developed. Of most interest to graduate deans is the program sponsored jointly by OISE and SBE, Developing Global Scientists and Engineers. This program has two parts, the doctoral dissertation enhancement project, and the International Research Experience for Students. OISE did receive a small budget increase reflecting support for both the provision of international activities for students and the international aspects of the Human and Social Dynamics priority area. Contact is through the OISE program officer in charge of the geographic area in which international activities are being proposed.

All of you probably already received the "Dear Colleague" letter from Bianca Bernstein, Director of the Division of Graduate Education (DGE), inviting applications for the Research on Learning and Education (ROLE) Program, in the Division of Research and Evaluation. This letter reflects DGE's increasing interest in research, assessment and outcomes measures associated with culture change in graduate education, and has already stimulated significant interest into research on graduate education. Keep in mind, however, that it is this division which will be seriously cut in the '06 NSF budget.

Lastly, please take a few minutes to check out the new NSF website (www.nsf.gov), and do drop by and visit DGE when you are in Washington!

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