Professional Ethics Report

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ANSWERING NSF'S QUESTION: WHAT ARE THE "BROADER IMPACTS" OF THE PROPOSED ACTIVITY?

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For the past decade, those proposing grants and those reviewing grant proposals to the US National Science Foundation (NSF) have been required to answer two questions: (1) What is the intellectual merit of the proposed activity? and (2) What are the broader impacts of the proposed activity? To judge from the reaction of many members of the science, technology, engineering, and mathematics (STEM) community, assessing and articulating a proposed activity's "intellectual merit" is a far easier – and worthier – proposition than addressing its "broader impacts" [1]. Congress, however, feels differently. The recently passed America COMPETES Act (Public Law 110-69) not only reauthorizes NSF; it also requires NSF's Director to issue a report to Congress on the effect of the "Broader Impacts" Criterion (BIC) on the types of activities funded by NSF.

Many members of the STEM community would prefer that BIC be deemphasized. After all, insofar as it requires scientists and engineers to address issues such as increasing the participation of "underrepresented groups" or conducting research with "benefits to society," BIC may easily be interpreted as introducing extraneous political, cultural, or economic concerns into the pursuit of basic research. On the other hand, oriented by the desire to commit public funds only to enterprises that can demonstrate a good return on the public's investment, many members of Congress would prefer that BIC be reinforced. NSF, provider of grants to the STEM community, and author and enforcer of BIC, is stuck between a rock and a hard place. For the STEM community, NSF must be responsive to the value of scientific freedom. For Congress and the nation they represent, NSF must uphold the value of scientific responsibility. We believe there is a largely untapped resource available to help adjudicate this difference of perspectives.

Background

NSF's current review criteria went into effect on October 1, 1997. Over the past decade proposers and reviewers alike have displayed a general facility with addressing the "intellectual merit" of proposed activities; but they often voiced their confusion or resistance to discussing the "broader impacts" of a proposal. Indeed, by 2002 proposer and reviewer attention to BIC was found to be so lax that NSF issued Important Notice No. 127, which advised the STEM community that NSF would return without review proposals that did not address *both* merit review criteria [2].

However, although the *quantity* of proposals and reviews that address BIC has shown steady improvement since 2002, even the most recent reports from NSF's Committees of Visitors (COVs) and Advisory Committee for GPRA Performance Assessment (AC/GPA) note continuing problems with the *quality* of responses [3].

Since 2005, several efforts have been undertaken by education and public outreach (EPO) professionals – who assist in communicating scientific and technical information to members of the public, e.g., through museums and other informal education venues – to help STEM researchers learn how to use EPO methods or partner with EPO professionals to address "broader impacts" in their NSF proposals [4].

Despite such efforts, however, confusion and resistance on the part of some members of the STEM community concerning BIC remains strong. A recent article in *American Physical Society News* suggests that members of this scientific community are giving BIC "mixed reviews," noting that, while some support BIC, many view the criterion as "confusing, burdensome, inappropriate, or counterproductive," and quoting one who describes it as "punitive" [1]. Such remarks echo those made by many members of the larger STEM community both prior to and shortly after BIC's introduction [5].

We suspect that such sustained resistance to BIC is symptomatic of some underlying, unrecognized, and so far unremitting *philosophic* unrest within the

(***Holbrook*** and ***Frodeman*** continued from page 1)

STEM community. Agitation in the face of BIC is a likely reaction from anyone at ease with the assumption that beneficial societal impacts will eventually follow from a *laissez faire* approach to basic research or who understands basic research as essentially a pure search for knowledge for the sake of knowledge [6]. Such philosophic interpretations of the nature of basic research are highly compatible with the idea of "intellectual merit," but they tend to conflict with the idea that "broader impacts" ought to be the concern of basic researchers.

If we are correct, then reacting to BIC with confusion or resistance is due not only to the fact that most scientists and engineers are trained in how to conduct research with strong "intellectual merit" and are not trained in how to address the "broader impacts" of their research. It is also that too few basic researchers are taught to ask, much less to answer, the more philosophical question as to *why* the "broader impacts" of their research are important [7].

Making Sense of the "Broader Impacts" of Science and Technology

For some, however, questioning whether Federal support for unfettered basic research in return for the "inevitable" societal benefits that would "naturally accrue" is a good idea – or even whether the basic/applied distinction is at all sustainable – is old hat. Indeed, researchers on science, technology, and society (ROSTS) – from disciplines such as History, Philosophy, Policy Studies, and Science and Technology Studies (STS) – have been asking and answering these questions (usually in the negative) for years [8]. With few exceptions, however, ROSTS have not addressed this question in the specific policy context of NSF's merit review criteria [9].

Unlike EPO professionals, ROSTS have generally failed to see the issues surrounding BIC as an opportunity to put their research on science, technology, and society to good use. The irony of this situation is palpable, given that much of the research conducted by ROSTS focuses on the disconnect between knowledge production and knowledge use [10]. In order to redress the balance, a research workshop on "Making Sense of the 'Broader Impacts' of Science and Technology" was held at the Colorado School of Mines, in Golden, Colorado on August 5 – 7, 2007 [11].

The initial goals of the workshop were to reflect on the rationale behind BIC, as well as to investigate whether ROSTS can assist STEM researchers in addressing the "broader impacts" of their research.

The organizing committee gathered together 26 participants from 16 institutions and two foreign countries. The disciplinary backgrounds of participants included Applied Mathematics, Atmospheric Physics, Biology, Classics, Ecology, Electrical Engineering, Environmental Studies, Geology, History, Law, Mechanical Engineering, Neuroscience, Philosophy, Physics, Political Science, Public Policy, Social Science, STS, and Zoology.

Participants quickly reached consensus on four points:

- BIC is susceptible to multiple justifications.
- ROSTS are well suited to help articulate why addressing "broader impacts" is important.
- ROSTS can help advise STEM researchers on how they might address BIC.
- ROSTS have potential not only to aid STEM researchers, but also to help inform decision making vis-à-vis BIC.

The Plot

Presentations were given and vigorous discussions were held covering four broad, BIC-relevant themes: (1) describing the historical background of BIC's introduction by NSF; (2) placing BIC within a larger context vis-à-vis review criteria at other Federal granting agencies, as well as internationally; (3) outlining various alternatives for implementing BIC; and (4) offering a broader range of approaches to interpreting BIC.

Some Issues Raised

- Whether problems with the quality of responses to BIC were a question of the *wording* of the criterion or a question of the *implementation* of the criterion.
- Whether researchers whose primary expertise covers a specialized area of science or engineering possess the relevant expertise to assess and address broader impacts.
- Whether and how ROSTS should/could be included in the proposal preparation and review process across a broad range of NSF programs (i.e., a range that extends beyond the Science and Society Program, e.g., as members of proposal review panels in the BIO Directorate).
- Whether STEM researchers should set aside a small percentage of their funding to be dedicated to BIC-related activities (e.g., following the model of the ELSI Program of the Human Genome Project), and whether this approach would be consistent with the goals of BIC (i.e., would it absolve the STEM researchers of their responsibility for thinking through the broader impacts

(***Holbrook*** and ***Frodeman*** continued on page 3)

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(***Holbrook*** and ***Frodeman*** continued from page 2)

of their research if they merely set aside a percentage of funding to be used to subcontract EPO professionals or ROSTS?).

- Whether addressing broader impacts is a task best left to each individual NSF grant recipient, or one more suited to collaboration between and among recipients on some higher organizational level (e.g., research cluster, academic department, or university).
- Whether interpreting BIC only as "the education and outreach criterion" tends toward "advertising" for science and technology and away from BIC's potential to inspire critical reflection (e.g., about the responsible conduct of research).

Some Tentative Conclusions Reached

- That the goals and wording of BIC merit further consideration inside NSF, by the larger STEM research community, and by society.
- That ROSTS can provide a valuable service to NSF, to the STEM community, and to society at large by focusing their attention on BIC and by communicating their results independently of NSF's internal efforts.
- That ROSTS should attempt to join forces with EPO professionals in order to disseminate a broader view of BIC that incorporates a critical element.

The Plot Thickens – America COMPETES

In a development that occurred independently of our research workshop planning, on August 9, 2007, the America COMPETES Act (H.R. 2272) was signed into law (Public Law 110-69). The America COMPETES Act (in Section 7022) requires the Director of NSF to issue a report to Congress "on the impact of the broader impacts grant criterion used by the Foundation" within one year of the date of enactment of the Act. In addition, it requires (in section 7008) "that all grant applications that include funding to support postdoctoral researchers include a description of the mentoring activities that will be provided for such individuals, and shall ensure that this part of the application is evaluated under the Foundation's broader impacts merit review criterion."

Although America COMPETES was not part of the original motivation for our workshop, workshop participants did discuss its impending passage and agreed that our research represents an important potential source of independently gathered information of value to NSF and the Director in answering this Congressional charge. Some participants suggested that our discussions might also be of interest to members of Congress.

Summary

This workshop was an important step in focusing the attention of ROSTS on issues associated with BIC, as well as in bringing the contributions ROSTS can make to the attention of the larger STEM community and to decision makers. Having ROSTS focus on BIC makes sense because of their professional involvement with issues relevant to the broader impacts of science and technology on society (not to mention the impacts of society on science and technology). Given the recent passage of the America COMPETES Act, focusing the attention of ROSTS on BIC could not have come at a better time. It remains to be seen, however, whether the knowledge we produce will be put to good use.

[1] "NSF's 'Broader Impacts' Criterion Gets Mixed Reviews," *American Physical Society News*, June 2007, Volume 16, Number 6, available online at: http://www.aps.org/publications/apsnews/200706/nsf.cfm.

[2] See http://www.nsf.gov/pubs/2002/iin127/imptnot.pdf.

[3] See http://www.nsf.gov/about/performance/advisory.jsp.

[4] For a list of "how to" workshops, see: http://humanitiespolicy.unt.edu/sci_eng/criterion2_workshops.php

[5] See *A Study of the National Science Foundation's Criteria for Project Selection*, a report by the National Academy of Public Administration for the National Science Foundation, February 2001.

[6] We should note, of course, that not *all* members of the STEM community display such an attitude, that some have cogent arguments against BIC, and that some were standout participants in our workshop.

[7] See http://physicsworld.com/cws/article/indepth/838 for an exception that argues against the rule.

[8] See the entry on "Science Policy" by Roger A. Pielke, Jr. in the *Encyclopedia of Science, Technology, and Ethics*, Carl Mitcham, Ed., (MacMillan Reference, 2005) for an excellent summary of this issue, as well as a very helpful bibliography.

[9] See Robert Frodeman and J. Britt Holbrook, "Science's Social Effects," in *Issues in Science and Technology*, Vol. 23, Issue 3 (Spring 2007); J. Britt Holbrook, "Assessing the Science – Society Relation: The Case of the U.S. National Science Foundation's Second Merit Review Criterion," in *Technology in Society*, Vol. 27, Issue 4, November 2005, p.p., 437-451; J. Britt Holbrook and Robert Frodeman, "Policy Dimensions of NSF's Criterion 2," in *Ogmius*, the Newsletter of the Center for Science and Technology Policy Research at the University of Colorado, Boulder, Number 13, Fall 2005 (available online at: http://sciencepolicy.colorado.edu/ogmius/archives/issue_13/index.html); and J. Britt Holbrook, "National Science Foundation Second Merit Criterion," in the *Encyclopedia of Science, Technology, and Ethics*, Carl Mitcham, Ed., (MacMillan Reference, 2005).

[10] ROSTS, it seems, are just as agitated about the implications of putting their research to use as are basic researchers from the STEM community. See, for instance, the very interesting exchange between Andrew Webster, Helga Nowotny, and Brian Wynne on p.p. 458 – 503 of *Science, Technology, and Human Values*, Vol. 32, No. 4, July 2007.

[11] The workshop (http://www.ndsciencehumanitiespolicy.org/workshop/) was co-sponsored by NSF, the Division of Liberal Arts and International Studies (LAIS) Hennebach Program in the Humanities at the Colorado School of Mines, the Department of Philosophy and Religion Studies at the University of North Texas, and the AAAS Scientific Freedom, Responsibility, and Law Program.

In the News

AGAINST ABIGAIL – D.C. CIRCUIT RULES AGAINST RIGHT TO EXPERIMENTAL DRUGS

On August 7, 2007, the D.C. Circuit Court of Appeals ruled against Abigail Alliance in an 8-2 decision. Abigail Alliance has fought for access to drugs that have passed Phase I (safety) of clinical trials, and initially sued the FDA in 2003, claiming that in restricting access to experimental drugs for the terminally ill, the FDA violates the Due Process Clause in the Fifth Amendment – "[n]o person shall be …deprived of life, liberty, or property, without due process of law." After the D.C. Circuit ruled in favor of Abigail Alliance in May 2006, the FDA petitioned for a rehearing to demonstrate "compelling interest" in restricting the constitutional rights of the terminally ill. On August 7th, the court ruled "that the FDA's policy of limiting access to investigational drugs is rationally related to the legitimate state interest of protecting patients, including the terminally ill, from potentially unsafe drugs with unknown therapeutic effects."

Author of the recent ruling, Circuit Judge Thomas Griffith, wrote, "there is no fundamental right 'deeply rooted' in this Nation's history and tradition of access to experimental drugs for the terminally ill." The court "observe[s] not a tradition of protecting a right of access to drugs, but rather governments responding to the risks of new compounds as they become aware of and able to address those risks…a lack of government interference throughout history might be some evidence that a right is deeply rooted. But standing alone, it cannot be enough." Thus, Griffith denied the Alliance's claim that patients were free to determine drug efficacy before the 1962 Amendments of the Food, Drug, and Cosmetic Act.

In dissent, Circuit Judge Judith W. Rogers and Chief Judge Douglas H. Ginsburg, argued that common law doctrines do establish a liberty, "deeply rooted in this Nation's history," for the terminally ill to choose potential, life-saving medicines. Although the court's decision was based upon the historical absence of using every possible attempt to save one's life in a medical context, it does not eliminate common law doctrines that herald the protection and attempts to preserve life. These rights predate civilization and have existed since man's inception. Furthermore, Rogers noted that 21% of the time, doctors prescribe a drug for "off-label use" that "is not deemed safe or effective for that use." Drugs that have passed Phase I have at least been deemed sufficiently safe to test in human subjects.

The Washington Legal Foundation, Abigail Alliance's legal counsel, expects to appeal to the U.S. Supreme Court.

For the D.C. Circuit's full decision, go to: http://pacer.cadc.uscourts.gov/docs/common/opinions/200708/04-5350c.pdf

*JS

FDA TASK FORCE ON NANOTECHNOLOGY

On July 25, 2007, the Nanotechnology Task Force of the U.S. Food and Drug Administration issued a report on two important issues in nanotechnology and health today: 1) the science surrounding biological interactions of nanoscale materials; and 2) recommendations for nanotechnology regulations and policies.[1] The report defines the products of nanotechnology as having "chemical, physical, or biological properties that are different from those of their larger counterparts [which] may include altered magnetic properties, altered electrical or optical activity, increased structural integrity, or altered chemical or biological activity."[2] Regulation of nanoscale materials is important, as with any emerging technology, but the balance of benefit and safety is complicated in this case due to the vast flexibility in the commercial use of these materials, as well as their microscopic size (1 nanometer=1 billionth of a meter).

The Task Force agreed that sufficient research must be conducted in order to ensure the safety and reliability of products using nanotechnology, and of the tools and methods used to assess their effects. A major question concerned products, the inspection of which is not required by the FDA before marketing, such as certain cosmetics, dietary supplements, and "GRAS" foods (Generally Recognized as Safe). This issue prompted several recommendations, including "requesting data and other information about effects of nanoscale materials on safety and, as appropriate, effectiveness of products; FDA guidance to manufacturers about when the use of nanoscale ingredients may require submission of additional data, change the product's regulatory status or pathway, or merit taking additional or special steps to address potential safety or product quality issues; seeking public input on the adequacy of FDA's policies and procedures for products that combine drugs, biological products, and/or devices containing nanoscale materials to serve multiple uses; and encouraging manufacturers to communicate with the agency early in the development process for products using nanoscale materials, particularly with regard to such highly integrated combination products."[3] Labeling or restrictions, at least with current understanding of nanotechnology, need only be utilized if these materials are expected to alter significantly the product or its effects.

[1] *Nanotechnology: A Report of the U.S. Food and Drug Administration Nanotechnology Task Force.* July 25, 2007. Executive Summary, ii. http://www.fda.gov/nanotechnology/taskforce/report2007.pdf
[2] *Ibid*. p.4.
[3] *Ibid*. Executive Summary, iii.

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NANOTECH GETS R RATING: CTA SAYS SUPERVISION REQUIRED

Taking a more restrictive stance than the FDA, on July 31, the International Center for Technology Assessment (CTA) issued a press release from a broad coalition of organizations calling for increased oversight of nanotechnology. They cited the inadequacy of current laws, as well as the potential dangers of nanotechnology, as motivating factors for their concern.

Nanotechnology, which involves manipulating matter at the atomic and molecular level, shows great promise for revolutionizing industry, health, and many other facets of modern life. However, the full consequences of tweaking molecular properties are not

(**News** continued on page 5)

(**News** continued from page 4)

fully understood. Preliminary research has indicated that there are a number of dangers, including increased toxicity, and a number of ethical implications, such as the extent to which one should enhance human capabilities. Says Beth Burrows of the Edmonds Institute, as quoted in the press release: "Given our past mistakes with 'wonder technologies' like pesticides, asbestos and ozone depleting chemicals, the rapid commercialization of nanomaterials without full testing or oversight is shocking."[1]

While CTA's general hope is that the commercialization of nanotechnology be halted until the ethical and safety issues have been considered, the coalition's declaration deals with eight fundamental principles for effective oversight. These include mandatory nano-specific regulations, efforts to secure the health and safety of the public and workers, environmental protection, transparency, and manufacturer liability.

The full report can be found at: http://www.icta.org/doc/Principles%20for%20the%20Oversight%20of%20Nanotechnologies%20and%20Nanomaterials_final.pdf

[1] "Broad International Coalition Issues Urgent Call for Strong Oversight of Nanotechnology," International Center for Technology Assessment press release (Washington DC, July 31, 2007).

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COMMISSION OF THE EUROPEAN COMMUNITIES: ON BIO-PREPAREDNESS GREEN PAPER

In a July 11, 2007 press release, the Vice-President of the Commission of the European Communities indicated that the recent London attacks instigated by terrorists linked to the U.K's National Health Service "demonstrate that terrorist threat continues to be real…Therefore, risks from dangerous biological materials and pathogens have to be reduced and preparedness fostered in Europe..."[1] On July 11th, the Commission adopted a Green Paper on Bio-preparedness that challenges stakeholders, i.e., law enforcement, bio-industry, health communities, academic institutions, and customs, to identify which frameworks already exist, how they are implemented, their limitations, and where they find room for improvement. Comments from stakeholders are due October 1, 2007 to Biopreapredness@ec.europa.eu or the European Commission, Bio-preparedness consultation, LX-46 3/093, 1049 Brussels, Belgium.

Among suggestions to enhance bio-safety is the establishment of an advisory body -- European Bio-Network (EBN). The EBN would promote cross-border and international cooperation, as well as assemble the expertise needed to recommend guidelines, codes of conduct, and educational resources. In terms of codes of conduct, the document proposes compulsory life science courses that "could focus on dual-use consequences of bio-research and on ethics of bio-research" to develop a sound culture of awareness and compliance.

With respect to research, the Commission recommended that grants be awarded on the ability to follow bio-standards and future guidelines, in addition to a proposal's quality. The Green Paper further suggests that research with dual-use potential should be published in a public version, without sensitive content, and a restricted version, with sensitive content, accessible only to pertinent stakeholders. The *Times Online* commented this would "likely…raise fears of censorship,"[2] despite the Commission's claims to the contrary.

[1] "Commission adopts a Green paper on bio-preparedness"; http://europa.eu/rapid/pressReleasesAction.do?reference=IP/07/1065&format=HTML&aged=0&language=EN&guiLanguage=en (July 11, 2007).

[2] Charter, D., "University researchers to be vetted to tackle bio-terror threat," *Times Online* (July 10, 2007).

*JS

In the Societies

REPONSIBLE RESEARCH CONDUCT IN SOCIAL WORK

The Council on Social Work Education (CSWE) has issued a *National Statement on Research Integrity in Social Work*,[1] and an action plan for its implementation.

The *Statement* consists of eight points to guide the effective and ethical practice of social workers and researchers. The first point emphasizes the need for the protection of research subjects, particularly those in "vulnerable" populations, and recommends a close relationship of researchers with institutional review boards (IRBs). The second point encourages social workers to act as mentors, and "instill the mentee with the ethics, techniques, and community of the profession." Third, researchers are warned against conflicts of interest related to personal advancement or financial gain in their collaboration with other institutions. Fourth, beneficial relationships with various branches of the sciences and other professions are encouraged in order to help communities and advance knowledge. The fifth point addresses regulatory obligations associated with the collection, organization, and dissemination of new data and technologies. It encourages researchers to work closely with government, university, or other sponsors in order to fulfill research obligations. The sixth point stresses the importance of ethical publication practices and responsible authorship. The seventh point emphasizes the essential role of peer review, in which new research is evaluated by other members of the profession for data improvement and integrity. Lastly, social work researchers should be educated on the subject of research misconduct.

The accompanying action plan consists of fourteen guidelines for implementing the *Statement*. These guidelines emphasize promoting awareness and education in the social work community about the *Statemen*t, and about the importance of scientific and ethical integrity in research. Included are plans to increase participation in and communication with IRBs; widely distribute the *Statement* among social workers and members of the CSWE; include research ethics curricula in social work degree programs; create mentoring programs for researchers and students; work with the media; provide educational

(**Societies** continued on page 6)

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seminars at the CSWE as well as regional conferences; and revise the *Statement* periodically to accommodate changes and new information.

[1]http://www.cswe.org/CSWE/research/research/policies.

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APA REAFFIRMS POSITION ON TORTURE

On August 19, the American Psychological Association passed a motion reaffirming its 2006 Resolution Against Torture and other Cruel, Inhuman or Degrading Treatment or Punishment and voicing strong professional and moral objections to the use of torture in any context.

Both resolutions reflect the mission of the APA, which is "to advance psychology as a science and profession and as a means of promoting health, education and human welfare through the establishment and maintenance of the highest standards of professional ethics." Not surprisingly, the APA considers it incompatible with professional ethics for psychologists to use their knowledge and understanding of the human psyche to enable others to apply torture more effectively.

The APA's condemnation of torture is unequivocal, and recognizes no exceptional circumstances that might be invoked to justify cruel, inhuman or degrading treatment. Moreover, recognizing that treatment fitting the UN definition of torture can occur due to the conditions of confinement, independent of the actions of the captors, the resolution "expresses grave concern over settings in which detainees are deprived of adequate protection of their human rights."

The APA resolution offers both support and suggestions to psychologists who find themselves being asked to act unethically. It "affirms the prerogative of psychologists to refuse to work in [inhuman] settings," and cites the 2002 *Ethical Principles of Psychologists and Code of Conduct,* which affirms a psychologist's prerogative "to disobey laws, regulations or orders when they conflict with ethics." The APA Ethics Committee will prepare a casebook to establish guidelines for psychologists that are consistent with the respect for human rights required in the profession.

Finally, the APA resolution called on Congress and other branches of government to prohibit all methods of interrogation that use torture, and for the legal system to reject all evidence procured in an unethical, cruel or degrading manner.

The resolution can be viewed at: http://www.apa.org/governance/resolutions/notorture0807.html

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Resources

IEEE-CS/ACM SOFTWARE ENGINEERING CODE OF ETHICS ARCHIVE

The Illinois Institute of Technology's Center for the Study of Ethics in the Professions has established a new resource for scholars of practical and professional ethics. The IEEE-CS/ACM Software Engineering Code of Ethics Archive includes emails, faxes, and other documents associated with the drafting, debate, and final adoption of the joint IEEE Computer Society /ACM Software Engineering Code of Ethics and Standards of Practice. The collected documents provide a rich record of how software engineering developed from an occupation to a profession. Dr. Michael Davis, a participant observer in the drafting of the code, recently published an article entitled "Eighteen Rules for Writing a Professional Code of Ethics" based on this experience in the June 2007 issue of *Science and Engineering Ethics.* The archive is the final product of two projects funded by the National Science Foundation, and can be found at http://hum.iit.edu:8080/aire/mainindex.html. For more information about the archive, or to request access, please contact the CSEP Librarian, Kelly Laas, at cseplibrary@iit.edu.

NANOETHICSBANK

The IIT Center has also launched the NanoEthicsBank (NEB), produced with support from the National Science Foundation. The NEB is a resource on the social and ethical implications of nanotechnology. Items in the database fall into the following four categories:

- National and International initiatives to build a regulatory framework for nanotechnology research and development.
- Public perception and acceptance of nanotechnology, including popular media coverage, and efforts of public engagement by governments, academic institutions, and industry.
- Development of best practices and voluntary standards by industry and businesses using nanomaterials.
- Ethical development of nanotechnology: military use, questions of privacy and surveillance, bioethics, and nanomedicine.

Records contained in the database include all relevant citation information, an abstract, and links to material available on the World Wide Web. The full text of publicly available documents is included in the NEB, and more will become available as authors and publishers grant copyright permission.

The NEB is part of the NanoConnection to Society project, a resource for interchange about development and oversight of nanotechnology and for public engagement. The NanoConnection to Society database is part of the Center for Nanotechnology and Society, funded by the National Science Foundation. For more information, visit http://hum.iit.edu/NanoEthicsBank/intro/intro.html.

ENGINEERING ETHICS AT THE NATIONAL ACADEMY OF ENGINEERING

In the last few years, the National Academy of Engineering (NAE) has developed two centers with on-going programs related to engineering ethics. One is the Center for Advancement of Scholarship in Engineering Education (CASEE). The second, the Engineering Ethics Center (EEC), which was launched in Spring 2007, is the subject of this brief report.

A generous gift from NAE member

(**Resources** continued on page 7)

(**Resources** continued from page 6)

Harry Bovay, Jr. made the NAE EEC possible. Its overarching mission is to bring the ethical challenges of engineering to the attention of the engineering profession and to promote discussion and understanding of these ethical issues in the engineering community. As globalization leads to increasing interaction among regions and peoples of the world, ethical questions raised by technological development and innovation also become more complex. As key players in the design, testing, implementation and evaluation of these technologies, engineers and engineering professions and organizations must be involved, and can, in fact, lead the discussion of these crucial issues.

The Center will sponsor activities that encourage multi-disciplinary examination of these ethical issues by engineers, academics, and representatives of public and private organizations and government. It will draw on the expertise of NAE members to develop priorities and programs in the following areas:

- the identification and examination of engineering ethics issues,
- the promotion of research, teaching, and practice of engineering ethics,
- the development of unique resources in engineering ethics for individual engineers and engineering organizations.

One example of a unique resource in the EEC is the Online Ethics Center (www.onlineethics.org). It provides readily accessible literature and information, case studies and references, and discussion groups on ethics in engineering and science, focused on problems that arise in the work lives of engineers and scientists. This newly reformatted site, made possible by the Bovay gift along with the leadership of Dr. Wm. A. Wulf, former NAE president, and Dr. Caroline Whitbeck, founder of the original online center and professor emerita, Case Western Reserve University, serves practitioners, educators, students, and individuals interested in professional and research ethics. OEC contents provide engineers and engineering students with resources for understanding and addressing ethically significant problems that arise in their work. The online center is also a valuable resource for promoting learning and advancing the understanding of responsible research and practice in engineering and science.

EEC activities will also address issues related to the status of science and engineering education in the United States. The National Academies, of which NAE is a unit, are actively addressing these issues on several fronts. For example, an Academy committee is currently preparing an update of the popular guide *On Being a Scientist*. (Further information is available at http://www7.nationalacademies.org/obas/ .) The new edition should be helpful to researchers submitting proposals to the National Science Foundation under the America COMPETES Act. This Act requires researchers to include a mentoring plan for postdoctoral researchers. Applicants are to document proposed mentoring activities, such as "career counseling, training in preparing grant applications, guidance on ways to improve teaching skills, and training in research ethics." EEC will provide another focus point for help in addressing the requirements.

Initial plans for EEC activities include a series of meetings on engineering ethics and engineering leadership. The first meeting, tentatively scheduled for June 2008, will focus on engineering, social justice, and sustainable community development. Further information will be posted on the EEC website, www.nae.edu/ethicscenter.

EEC would also like to host NAE Fellowships in Engineering Ethics and will assist engineers who want to apply for support through the NSF Science and Society (S&S) program, which considers proposals for Post-Doctoral and Professional Development Fellowships. Information about the S&S program and procedures for applying are available at http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5324. The NSF program announcement number is 05-588.

The NAE has appointed an EEC advisory group, chaired by Dr. John Ahearne, an NAE member and former director of the Sigma Xi's ethics program. The group also includes Dr. Wulf, former president of NAE, who was a major force in the development of the EEC; Dr. Juan Lucena, Associate Professor, Liberal Arts and International Studies, Colorado School of Mines; Dr. Debra Stewart, President, Council of Graduate Schools; and Dr. Whitbeck, founder of the Online Ethics Center (OEC).

For information about EEC's priorities and activities or related programs, contact the EEC Director, Dr. Rachelle Hollander, at rhollander@nae.edu. Her office is in the Keck building, room 1011, 500 Fifth Street, NW, Washington DC 20001. You can also reach her by phone at 202-334-3068, or fax 202-334-2290.

NAE was established in 1964, under the charter of the National Academy of Sciences, as an autonomous organization of outstanding engineers to provide advice to government on matters of engineering science and technology.

COI TOOLKIT

A conflict of interest toolkit has been developed by the Federation of American Societies for Experimental Biology to help the biomedical research community build a more consistent framework in handling and disclosing financial ties among academia and industry. For more information, visit: http://opa.faseb.org/pages/advocacy/coi/toolkit.htm

Announcements

Award – NIH is seeking institutions/organizations/individuals to develop research ethics education. The International Research Ethics Education and Curriculum Development Award (R25) will allocate approximately $1.5 million in total. See http://grants.nih.gov/grants/guide/rfa-files/RFA-TW-08-002.html.

Book –UNESCO has published *Nanotechnologies, Ethics and Politics*. Experts in nanotechnology discuss the state of the art of nanotechnology, examine the controversy surrounding its definition and explore related ethical and political issues. See http://publishing.unesco.org/details.aspx?Code_Livre=4539.

Book - UNESCO has published

(**Announcements** continued on page 8)

(**Announcements** continued from page 7)

Environmental Ethics and International Policy. Experts in environmental ethics describe the current situation regarding environmental ethics and determine possibilities for international action in this area. See http://portal.unesco.org/shs/en/ev.phpURL_ID=10423&URL_DO=DO_TOPIC&URL_SECTION=201.html.

Book – The American Bar Association (ABA) has published *Biotechnology and the Law*. Topics include defining biotechnology, patent basics for biotechnology counsel, financing a biotech company, federal regulation of research through funding, FDA regulation of biomedical research, approval of products for human use, and litigation issues. See http://www.abanet.org/abastore/productpage/5450044.

Book - UNESCO has published *Educating Bioethics Committees*. This guidebook is intended to assist members of Bioethics Committees to pursue their knowledge of the complex multi-disciplinary field of bioethics. It provides examples, educational resources, and directs readers to materials in pursuit of more intensive education in bioethics. See http://unesdoc.unesco.org/images/0015/001509/150970e.pdf.

Brochure – UNESCO has published *Nanotechnologies and Ethics: COMEST Policy Recommendations*, which it hopes will identify the ethical purposes for research, development, and applications of nanotechnology, and address both the potential benefits and risks in this emerging field. See http://unesdoc.unesco.org/images/0015/001521/152146e.pdf.

Call for Papers – The Center for Applied and Professional Ethics and Philosophy Department at the University of Tennessee is seeking abstracts for papers, panel sessions, and workshops on the environmental consequences of energy production, distribution, consumption, and policy for a conference on *Energy & Responsibility* in Knoxville, April 10-12, 2008. Deadline is October 1, 2007. See http://isse.utk.edu/energy_and_responsibility/Energy_Ethics_Call.pdf.

Call for Papers - Abstracts for sessions, panels and papers are sought for ORI's *First Biennial Conference on the Responsible Conduct of Research (RCR) Education, Instruction, and Training*. Deadline is October 15, 2007. Material should be sent to Nick Steneck at nsteneck@umich.edu. The conference will be held at Washington University, St. Louis, on April 18-20, 2008. See http://ori.hhs.gov/conferences/upcoming_conf.shtml.

Call for Papers – The Department of Philosophy, University of Cape Town, South Africa; the Jean Beer Blumenfeld Center for Ethics, Georgia State University, USA; and the Society for Applied Philosophy, UK are seeking abstracts for their conference, *Bearing and Rearing Children: The Ethics of Procreation and Parenthood,* on May 26-28, 2008 in Cape Town, South Africa. Deadline for abstract submission is December 17, 2007. See http://www2.gsu.edu/~wwwphl/ethics/events/Capetownflyer2008-9.pdf.

Call for Papers - The Institute for Electrical and Electronics Engineers (IEEE) and the International Islamic University of Malaysia are seeking papers for the International Conference on Engineering Professional Ethics and Education 2008 in Kuala Lumpur, Malaysia on May 13-15, 2008. Deadline for abstract submission is November 1, 2007. See http://www.iiu.edu.my/icepee/index.php?option=com_content&task=view&id=12&Itemid=26.

Call for Papers – Papers are invited for the 16th *European Conference on Information Systems* (ECIS) held June 9th-11th in Ireland. Topics include Information Systems (IS) development; design theory, research and practice in IS; and IS ethics. Deadline for submission is November 15th. See http://www.ecis2008.ie//index.php?option=com_content&task=view&id=33&Itemid=68.

Call for Papers - The Prindle Institute of Ethics at DePauw University invites students to submit papers for its Undergraduate Ethics Symposium on topics that include issues about human rights, environmental ethics, media ethics, ethics of international relations, science research ethics, personal ethics, and ethics and religion. Papers are due February 1, 2008. See http://prindleinstitute.depauw.edu.

Conference - Duke University School of Law is hosting a conference on *Animals & Bioengineering: A Consideration of Law, Ethics and Science* on November 9-10, 2007 in Durham, North Carolina. Among the co-sponsors is the American Bar Association Section of Science and Technology Law. See http://www.law.duke.edu/aba-animalconference.

Conference – On October 4-5, 2007 the philosophy department of Delft University of Technology and the 3TU.Centre for Ethics and Technology will hold a workshop entitled, *The Ethics of Neuroimaging*, at the Delft University in the Netherlands. See http://www.ethicsandtechnology.eu/index.php/news/comments/ethics_of_neuroimaging.

Conference – PRIM&R will hold *the 2007 Annual HRPP Conference* at the Sheraton Boston Hotel & Hynes Convention Center on December 1-4, 2007 to discuss changes in the research arena and how institutions can better respond to these changes. See http://www.primr.org/vango/core/events/eventdetails.aspx?meeting=HRPP_07.

Conference – The conference, *Activities of Bioethics Committees and Education in Bioethics*, on November 14-15th in Minsk, Belarus will be hosted by the UNESCO Office in Moscow, the National Commission of the Republic of Belarus for UNESCO, and the Ministry of Health of the Republic of Belarus. Topics include organization of activities of national bioethics committees and ethics expertise in scientific research by local bioethics committees, and the improvement of bioethics training of specialists and education in bioethics for the general public in Belarus and other CIS states (Azerbaijan, Armenia, Georgia, Kazakhstan, Moldova, Russian Federation, Ukraine). See http://portal.unesco.org/shs/es/ev.php-URL_ID=11340&URL_DO=DO_PRINTPAGE&URL_SECTION=201.html

Fellowships – The University of Toronto's Centre for Ethics will award two Visiting Faculty Fellowships for the 2008-2009 academic year. Fellows will write and conduct research about ethics, participate in seminars, colloquia, and public lectures, and will be involved in the undergraduate Ethics, Society, and Law Program. Applications must be received by January 30, 2008. Applicants must hold a university faculty appointment at the time of application and there is no restriction on discipline or citizenship. See http://www.ethics.utoronto.ca/index.php?id=18.

New Journal – *NanoEthics* is a new publication that aims "to advance the examination of ethical and social issues surrounding nanotechnologies in a philosophically rigorous and scientifically informed manner," according to the editor in chief, John Weckert. *NanoEthics* will be available three times a year in print and online at www.springerlink.com.

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