

# ARTICLE

## PEER REVIEW IN AWARDING FEDERAL GRANTS IN THE ARTS AND SCIENCES

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## I. INTRODUCTION

In the highly competitive industrialized world that is rapidly emerging from the ashes of the Cold War, a strong and vibrant research and development capacity is essential to a country's success. In most industrialized nations, the government plays a prominent role in assembling and sustaining a sound scientific and engineering infrastructure. Most modern governments also provide financial support for other desirable professional endeavors, such as music, literature and other fine arts, though usually not on as grand a scale. The United States has depended to a very large degree upon "peer review" to aid the government in making the difficult scientific and artistic judgments that necessarily arise in deciding whom among a large pool of applicants will receive limited governmental resources. When the government relies upon peer review, it does not attempt to persuade researchers to undertake particular research projects or artists to create particular kinds of art. Instead, a granting agency allocates sums of money to entire fields and allows the researchers, artists, or performers to develop creative proposals for projects that they would like to undertake.<sup>1</sup> A group of "peers" with expertise in the relevant area then evaluates and ranks the proposals, leaving the ultimate funding decisions up to the government officials in charge of the relevant programs.

Although the peer review model has proved remarkably durable in the 30 to 40 years during which United States agencies have employed it, it is far from perfect. This article will examine one especially worrisome aspect of peer review systems for awarding discretionary grants—their capacity for both ad hoc and systematic bias for and against individuals, groups, and innovative new ideas.<sup>2</sup> The article draws upon the experiences of several discretionary grants programs in four granting agencies: the National Institutes of Health (NIH); the National Science Foundation (NSF); the Environmental Protection Agency (EPA); and the National Endowment for the Arts (NEA). The following description of these programs draws on an extensive literature on peer review in NIH and NSF and a growing literature on the NEA grants process. More importantly, the article relies upon extensive interviews with agency

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1. The above description is somewhat idealized to the extent it suggests that the funding agencies do not attempt to steer research. Obviously, budgetary decisions about which programs get what funds send messages to potential researchers about where they should direct their efforts. Sometimes the signals are more direct as, for example, when NSF refused to continue funding a supercomputer center that used a particular brand of computer. See Ellis Booker, *NSF Cuts Supercomputer Grant*, *COMPUTERWORLD*, Oct. 30, 1989, at 127.

2. The article will not examine the closely related question of whether the funding programs themselves are biased toward or against funding research aimed at benefiting particular groups.

officials and, in some cases, successful and rejected applicants.<sup>3</sup> Although all four of these agencies rely heavily upon peer review in awarding discretionary grants, they vary in how they manage the peer review process. None of the programs has completely eliminated the potential for bias, but some have made great strides in that direction. Each can learn lessons from the others, and the many other granting agencies in the federal government that rely upon peer review can learn a great deal from their combined experience.

After examining the potential for bias in the peer review process and analyzing existing legal curbs on bias, the article will compare the peer review model to the primary competing model for awarding discretionary grants—the “strong manager” model that is used in many defense-related agencies. Concluding that on balance the peer review model is most appropriate for awarding discretionary grants in the arts and sciences, the article will suggest some procedural reforms that should help reduce the potential for bias at a relatively low cost.

### A. The Nature of the Peer Review Process

A “peer review” system of allocating governmental resources relies primarily upon the informed recommendations of experts in the relevant field of inquiry.<sup>4</sup> First used more than three hundred years ago for evaluating the scientific merit of journal articles, it was later adopted by the National Advisory Cancer Council and the Office of Naval Research in the 1930s and 1940s for assessing applications for scientific grants. In the ensuing years the peer review model has evolved into a highly regularized vehicle for awarding research grants that “legitimizes the flow of resources and the establishment of priorities” in the scientific granting agencies.<sup>5</sup> By the mid-1980s the Board of Directors of the American Association for the Advancement of Science could conclude

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3. All interviewees were assured that their responses would remain confidential. Several graciously consented to allow their interviews to be cited for attribution; most did not want their names associated with the article. In all cases the interviewees’ wishes were honored. Candor was more important to the author than the ability to attribute a factual statement to a particular source.

4. Chubin and Hackett define peer review as: “An organized method for evaluating scientific work which is used by scientists to certify the correctness of procedures, establish the plausibility of results, and allocate scarce resources (such as journal space, research funds, recognition, and special honor).” DARRYL J. CHUBIN & EDWARD J. HACKETT, *PEERLESS SCIENCE: PEER REVIEW AND U.S. SCIENCE POLICY* 2 (1990). A House subcommittee report on peer review in NSF defines “peer review system” as “any method of evaluating a specialized creation such as a proposal to perform scientific research which involves having a group of people knowledgeable in the area of specialization evaluate the creation.” SUBCOMMITTEE ON SCIENCE, RESEARCH, AND TECHNOLOGY OF THE HOUSE COMM. ON SCIENCE AND TECHNOLOGY, 94TH CONG., 2D SESS., NATIONAL SCIENCE FOUNDATION PEER REVIEW 13 (Comm. Print 1976) [hereinafter HOUSE COMMITTEE REPORT ON NSF PEER REVIEW].

5. Daryl J. Chubin & Sheila Jasanoff, *Peer Review and Public Policy*, 10 *SCI., TECH. & HUMAN VALUES* 3 (1985).

that "the scientific community has accepted primary responsibility for defining research needs and opportunities and providing assurance that public funds are allocated on a priority basis, through peer review."<sup>6</sup>

Peer review in the arts is of more recent vintage. Until the mid-1960s, patrons of the arts rarely invoked formal peer review as a vehicle for making funding decisions.<sup>7</sup> However, with the creation of the National Endowments for the Arts and Humanities (NEA), the federal government became the nation's most prominent single fine arts patron, and NEA borrowed the peer review model from the scientific funding agencies. As with the scientific agencies, peer review has helped legitimize NEA funding decisions among the practitioners of the arts, though not necessarily among members of the general public.<sup>8</sup>

### B. Bias in Decisionmaking

In the United States, peer review is intended to ensure that federal agencies award public funds to the most meritorious scientific and artistic projects in an accountable fashion. Within this process lies the potential for considerable tension. As longtime observers Chubin and Hackett note:

[P]eer review is expected to operate according to values of fairness and expediency, yet its *product* is to be trustworthy, high-quality, innovative knowledge. There is no assurance that the process will yield the product; to the contrary, the process may interfere with efforts to secure the product.<sup>9</sup>

Perhaps the most important goal of the peer review process is objectivity. Governmental allocation of monies to fund projects in the arts and sciences is built upon the assumption that objective criteria for excellence can be articulated and applied in a way that is capable of identifying meritorious proposals and of selecting the best from among these. To the extent that bias infects the decisionmaking process, it loses its objectivity and, consequently, its legitimacy.

The word "bias" takes on different meanings in different contexts. In the context of peer review, however, the concept comes close to the dictionary definition of "a highly personal and unreasoned distortion of judgment."<sup>10</sup> A biased decisionmaker does not decide questions on their merits, but rather, allows irrelevant personal considerations to intrude

6. American Association for the Advancement of Science, *Statement on Politics and Science*, 223 SCIENCE 27, 27 (1984).

7. See Alan M. Kriegsman, *The Dance Dilemma*, WASH. POST, Jul. 17, 1983, at L1 (quoting Richard LeBlond: "corporations don't have a peer review panel system for determining what dance to support—it's unique to NEA").

8. Joseph McLellan, *NEA: The First Twenty Years*, WASH. POST, Sept. 16, 1985, at D1 (peer review "seem[s] to have generated considerable respect for the NEA among American artists, who feel they are being evaluated not by bureaucrats but by fellow artists").

9. CHUBIN & HACKETT, *supra* note 4, at 3.

10. WEBSTER'S NINTH NEW COLLEGIATE DICTIONARY "bias"(1988).

into the decisionmaking process. Decisionmaking bias in the award of discretionary grants can result from animus, favoritism, or conflicts of interest. The first two aspects stem from the identity of the potential grantee; the latter has more to do with the characteristics and position of the decisionmaker. Bias can also crop up in the form of "tunnel vision," or the systematic refusal to give sufficient weight to particular criteria that are supposed to be relevant to the decision. Finally, bias in an otherwise objective process may be caused by ex parte lobbying and political pressure for or against particular persons or approaches.

### 1. ANIMUS

When an applicant's prospects of receiving a grant are adversely affected by some personal characteristic of that person unrelated to the articulated criteria, the program suffers from animus. This phenomena is also known as "blackballing." It may result from any one of a number of causes, ranging from personal dislike to philosophical differences to racial bias. Animus may also manifest itself in a general lack of regard for "mavericks" who challenge conventional norms. It can affect the decisionmaking process in many ways, from introducing factually inaccurate information into the deliberative process to ranking the applicant at the bottom of the list for no good reason.

### 2. FAVORITISM

Favoritism may be more prevalent than animus in the peer review system. A decision is affected by favoritism when one or more of the applicants in the applicant pool obtains favorable treatment for reasons that are not relevant to the statutory or administrative criteria. Favoritism may manifest itself in many ways, ranging from unmerited high ranking to the explicit singling out of an individual for the grant award. Nepotism is one form of favoritism; cronyism is another. The former is almost nonexistent in science, but the latter may play a role in peer review granting agencies. Favoritism is not necessarily limited to peer reviewers. The agency staff can also play favorites by selecting reviewers who are inclined to fund certain kinds of proposals and not others.<sup>11</sup>

### 3. CONFLICTS OF INTEREST

A conflict of interest exists when a decisionmaker's judgment is clouded by a personal stake in the outcome of the decisionmaking process. The clearest conflict of interest exists when the decisionmaker will obtain financial gain or suffer monetary loss if the decision goes one way rather than the other. For example, if a peer reviewer will share in the proceeds of the grant under review, the reviewer's judgment could be clouded by the prospect of financial gain. A reviewer also faces a conflict

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11. Rustum Roy, *Funding Science: The Real Defects of Peer Review and an Alternative To It*, 10 SCL, TECH. & VALUES 73, 73-81 (1985).

of interest if, through a consultantship or other arrangement with a company, the reviewer can convey financially valuable information obtained through the peer review process to the for-profit enterprise with which the reviewer is affiliated. These familiar forms of conflict of interest will be referred to here as "financial conflict of interest."

A less dramatic, though perhaps more prevalent, form of conflict of interest can be characterized as "research conflict of interest." An active researcher is always on the lookout for new ideas that have not been tried, previously undisclosed approaches that have succeeded, and novel approaches that have failed but have future potential. Even if a reviewer does not directly appropriate an idea from a grant application, much can be learned from the review process that is not available in published literature. Knowledge gained during peer review may steer a reviewer away from a line of inquiry that has proved fruitless for other researchers (and therefore not published in the literature), or it may trigger an idea that, given sufficient time, would have become apparent to the applicant.

Conversely, a reviewer who has established himself in one field of inquiry may tend to discourage the development of alternative lines of inquiry that may pose a threat to the reviewer's prominence. By simply downgrading a competitor's proposal, a reviewer can simultaneously reduce the competitor's probability for success and enhance the probability that the reviewer's research will continue to receive support. This can be especially troubling when the relevant scientific field is in the process of a "paradigm shift" in which younger scientists question the power of the old paradigm to explain new phenomena, seek out different formulations of the critical questions, and advance alternative theories to explain observations.<sup>12</sup> If the granting agency's review panels are filled with devotees of the old paradigm, research conflict of interest can impede the development of important new paradigms.

#### 4. TUNNEL VISION

Objectivity is also lost when the process becomes afflicted with "tunnel vision," a malady that obstructs the ability of highly trained professionals to view proposals from different perspectives. The problem is not so much invidious discrimination as it is the inability or unwillingness to see the relevance of entire categories of proposals. This tendency becomes a disadvantage when it operates to exclude qualified proposals that come within the statutorily or administratively drawn bounds of the program. A process that screens out irrelevant proposals is not biased; a process that excludes relevant proposals because the decisionmakers have an unduly narrow professional view of the domain of relevance may be biased.

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12. See generally, THOMAS S. KUHN, *THE STRUCTURE OF SCIENTIFIC REVOLUTIONS* (1962).

## 5. LOBBYING AND POLITICAL PRESSURE

In legislative decisionmaking bodies the most common vehicle for persuading the decisionmaking entity to send resources in one direction or another is the lobbyist. In the lobbying paradigm, the potential recipient of the funds or its paid representative makes as many contacts as possible with persons in a position to determine the outcome of the process and attempts to persuade them of the wisdom of steering resources to that supplicant. In the context of discretionary grants, prospective grantees or their representatives can attempt to persuade influential higher-ups in the Administration or important members of congress to "go to bat" for their proposals.

Although the lobbyist is a well respected participant in the legislative appropriations process, the legislative model does not necessarily lead to the most objective results. Rather than awarding grants on the merits of the applications, the process appears to favor insiders and influence-peddlers. A decisionmaking process in which the results depend upon political access and subtle promises and threats is not likely to be objective. It could create the impression that the results are biased in favor of the politically well-connected, and in the extreme could give rise to charges of partisan favoritism.

## II. PEER REVIEW IN FOUR FEDERAL AGENCIES

This section of the Article will examine the peer review process at work in four federal agencies. Because the range of grant programs in these agencies is so broad, the following descriptions will necessarily remain at a general level, but it should also convey a sense of the wide variety of granting programs to which the peer review mold is applicable.

### A. The National Institutes of Health

The National Institutes of Health (NIH) is a collection of research institutions in the Public Health Service of the Department of Health and Human Services.<sup>13</sup> One of the premier research institutions in the world, it provides almost seven billion dollars per year to support more than 25,000 separate research awards in health and environmental sciences. In a very real sense, NIH is the father of the biotechnology industry in the United States.<sup>14</sup> In addition to conducting its own research, NIH sponsors

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13. The National Institutes of Health are established by the Health Research Extension Act of 1985, Pub. L. No. 99-158, 99 Stat. 820 (codified as amended at 42 U.S.C. §§ 201-85 (1988)). NIH is composed of thirteen separate institutes, each of which directs its attention to a particular area of health-related research. See NATIONAL INSTITUTES OF HEALTH, NIH DATA BOOK (1989). Much of the research that NIH sponsors is conducted by federal employees at the flagship campus in Bethesda, Maryland and at several other research centers around the United States.

14. Thomas E. Malone, then Deputy Director of NIH, said of NIH's role in the biotechnology industry: "We fathered the industry. We are part and parcel of it." Nell

billions of dollars worth of research annually at universities and other public and private research institutions.<sup>15</sup> Virtually all of these outside grants, contracts and interagency agreements are awarded through an intricate process that relies almost exclusively upon peer review for evaluating the quality of grant proposals.<sup>16</sup>

Since NIH has in recent years suffered from chronic underfunding, the agency receives many more worthy applications than can be funded.<sup>17</sup> Therefore, the goal of its discretionary grant programs is to select the best from among a large number of very good applications. The major elements in evaluating proposals include assessments of: (1) the scientific merit and general significance of the proposed study; (2) the technical adequacy of the experimental design; (3) the competency of the proposed investigator or group; (4) the adequacy of the available and proposed facilities and resources; (5) the necessity of the budget items requested; and (6) the relevance and importance of the proposal to announced program objectives.<sup>18</sup>

NIH must by law "require appropriate technical and scientific peer review of . . . applications made for grants and cooperative agreements . . . for biomedical and behavioral research,"<sup>19</sup> and peer review plays an exceedingly important role in determining which projects are funded. NIH referral officers assign each application by subject matter to one of ninety standing peer review groups, usually referred to as "study sections," that are located within the Division of Research Grants.<sup>20</sup> The

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Henderson & Michael Schrage, *Government R & D Funding Spawns a New Industry*, WASH. POST, Dec. 16, 1984, at A1.

15. NIH has only funded research in for-profit institutions since 1981, and applications from private companies still constitute only a miniscule proportion of the total NIH budget. *See id.*

16. Although all of the Institutes follow the same model for awarding discretionary grants, the interviews upon which much of this description is based focused particularly upon four very diverse grant programs: (1) the Program for Cancer Cause and Prevention Research of the Division of Cancer Etiology of the National Cancer Institute; (2) the Program for Biological Response to Environmental Health Hazards of the National Institute of Environmental Health Sciences; (3) the General Clinical Research Centers Program in the Division of Research Resources of NIH; and (4) the Biomedical Research Technology Program in the same division of NIH.

17. *See* Gina Kolata, *Beginning Scientists Face a Research Fund Drought*, N.Y. TIMES, June 5, 1990, at C1.

18. OFFICE OF MANAGEMENT AND BUDGET, CATALOG OF FEDERAL DOMESTIC ASSISTANCE 283 (1989) [hereinafter OMB CATALOG]. The National Cancer Institute and the National Institute of Neurological and Communicative Disorders and Stroke in 1985 initiated grant programs designed to take special account of the applicants' track records in making longer-term awards. These special programs have relied on mail reviews similar to those typically used in NSF. *See* Barbara J. Culliton, *NIH Proposes Extending Life of Grants*, 226 SCIENCE 1400, 1402 (1984).

19. Health Research Extension Act of 1985, Pub. L. No. 99-158, 99 Stat. 880 (codified at 42 U.S.C. § 289(a) (1988)).

20. GENERAL ACCOUNTING OFFICE, UNIVERSITY FUNDING: INFORMATION ON THE ROLE OF PEER REVIEW AT NSF AND NIH 15 (1987) [hereinafter 1987 GAO REPORT]. The Division of Research Grants, which houses the study committees, is not within any of the individual

Division assigns to each study section a "Scientific Review Administrator" to provide clerical and ministerial support. Approximately 2,700 external reviewers serve four-year terms on NIH study sections.<sup>21</sup> Potential peer reviewers are identified through several sources, including the Scientific Review Administrator's knowledge of the scientists who work in the field and contacts at scientific meetings, NIH staff recommendations, existing research grant applications and awards, research publications, and recommendations of existing panel members.<sup>22</sup> No more than one member from a single institution may serve on a particular study section. Although most study section members are appointed for fixed four-year terms, members can be added on an ad hoc basis to provide additional expertise for particular proposals. When no existing study section appears to have the requisite expertise to evaluate a proposal or group of proposals, the Division can appoint an ad hoc study section for the limited purpose of reviewing a small number of applications. NIH also uses ad hoc committees to evaluate applications from study section members.

Each study section typically holds three annual meetings at which the reviewers collectively apply the Program's previously articulated selection criteria to the grant applications assigned to the section.<sup>23</sup> When no member of the panel has sufficient expertise to evaluate all aspects of a proposal, one or more external written reviews may be requested to aid the panel.<sup>24</sup> The application and any outside reviews are assigned to two or more panel members (called the primary and secondary reviewers) who prepare detailed written reviews prior to the panel meeting. All panel members are expected to read all of the applications.<sup>25</sup> Study sections in programs that fund large capital projects also conduct site visits to the institutions that house the projects at least one time per grant cycle.<sup>26</sup>

The study section's evaluation of each application typically consists of two separate steps. After hearing from the primary and secondary reviewers and discussing the proposal, the group first decides whether the application is deemed "worthy" of funding based on NIH selection criteria. Approximately 90 percent of the applications pass this

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Institutes, and its staff does not report to any of the Programs that are responsible for funding and managing the grants.

21. *Id.* Study section panelists are paid \$150 per day for their efforts plus travel expenses and per diem expenses.

22. *Id.* at app. IV.

23. Study section meetings are usually held at hotels near the NIH campus or at the locations of important scientific meetings.

24. NATIONAL INSTITUTES OF HEALTH MANUAL 4510: REFERRAL AND INITIAL REVIEW OF NIH GRANT AND COOPERATIVE AGREEMENT APPLICATIONS (1982) [hereinafter NIH MANUAL 4510].

25. *Id.*

26. Telephone Interview with Dr. Bernard Talbot (Sept. 26, 1990). Applicants are given the opportunity to specify particular scientists that they prefer not be on the panel conducting the site visit.

preliminary test.<sup>27</sup> The study section next assigns each worthy application a priority rating from which the NIH staff computes a priority score. A "summary statement," which the Scientific Review Administrator prepares from any pre-meeting written reviews and notes of the meeting, relates the application's score and articulates the group's reasons for assigning it that score.<sup>28</sup> Only the summary statement accompanies the application to the next stage of the review process—review by the Advisory Council for that Institute.<sup>29</sup>

Each Institute has an Advisory Council composed of scientists and lay persons appointed by the Secretary of Health and Human Services or, in some cases, by the President. Membership on some Advisory Councils is regarded as a "political plum"; for example, the lay members of the National Cancer Advisory Board (the Advisory Council for National Cancer Institute) are usually prominent supporters of the political party in power that have an active interest in cancer.<sup>30</sup> In addition to providing broad advice on how the Institute should allocate funds among programs, the Advisory Councils review the summary statements and recommendations of the study sections for scientific merit and for consistency with non-technical programmatic goals.<sup>31</sup>

Although Advisory Council review is not perfunctory, the Councils are highly deferential to study section recommendations.<sup>32</sup> Only about ten percent of the applications are singled out for review by the Advisory Councils and a much smaller proportion result in any special action.<sup>33</sup> The Councils almost never involve themselves in minor budget adjustments and the nitty gritty of detailed scientific evaluation. Their function is to evaluate the overall output of the study section meetings, not to second-guess the study sections on individual applications. This limited Advisory Council involvement is, in any event, an inevitable consequence of the program's workload. For example, in the National Cancer Institute, the agency staff mail about 1400-1500 summary statements out to Advisory Council members two to three weeks before the triennial meetings. Even the most conscientious council member

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27. CHUBIN & HACKETT, *supra* note 4, at 4.

28. The summary statement, "while not necessarily exhaustive, should be complete and represent a group evaluation of each application." It must contain "objective factual information, carefully documented and well justified." It must also include "pertinent material from the meeting discussions." NIH MANUAL 4510, *supra* note 24, at 13.

29. See 1987 GAO REPORT, *supra* note 20, at 11-13.

30. Past members of the National Cancer Advisory Board have included Ann Landers, Richard Block of H & R Block, and former United States Senator Tim Lee Carter.

31. The Secretary chooses Advisory Council members from among those nominated by NIH, members of Congress, special interest groups, other entities within HHS and the general public. 1987 GAO REPORT, *supra* note 20, at 16.

32. Chubin and Hackett conclude: "The NIH awards process is hardly one of 'dual review' for the second stage rarely considers the merits of individual proposals (or, if they do so, their consideration makes essentially no difference in the final rankings)." CHUBIN & HACKETT, *supra* note 4, at 22.

33. *Id.* at 22.

cannot realistically examine all of the evaluations in detail prior to the meetings.

Next, the Institute's Program Director ranks the "fundable" applications, drawing on the Advisory Council's comments, the applications, and accompanying summary statements. Because scientific merit is not the only criterion, the staff may suggest departures from the study section rankings. But this rarely happens (less than three percent of the time),<sup>34</sup> because it requires the Program Director to draft a special petition and pursue the matter through the Institute's hierarchy. Some Program Directors typically set aside some funds to allow themselves discretion to fund some projects that fall very close to the cut-off line, a process that is referred to internally as "funding by exception."<sup>35</sup>

NIH has always interpreted the Privacy Act to require that its peer review files for individual grant applications be made available for examination and correction by the applicants but otherwise shielded from public disclosure. Portions of panel and Advisory Council meetings that discuss the merits of individual proposals are also closed to the public.<sup>36</sup> The staff instructs panelists that all materials related to the review of grant applications are strictly confidential, and panelists may remove no written materials from the conference room. Reviewers may not share the contents of the panel deliberations with applicants or their institutions.<sup>37</sup> However, the agency's guidelines and regulations do not specify particular sanctions for breaches of confidentiality. In practice, the only sanction is the stigma that accompanies removal from a panel.

NIH makes grant applications for funded projects and a general description of the awards available to the public after the completion of each funding round. Interim and final progress reports and the results of any audits or reviews of the grant are also available to the general public. Pending or disapproved applications for new grants, memoranda and transcripts from panel meetings, and other written communications from reviewers are not automatically available, but the agency may release information contained therein upon receiving a request pursuant to the Freedom of Information Act (FOIA).<sup>38</sup> Although the D.C. Circuit Court of Appeals held in *Washington Research Project, Inc. v. Dept. of Health, Education and Welfare*<sup>39</sup> that the contents of all grant applications are generally releasable under FOIA at the end of the funding cycle, NIH has recently taken a broad view of the applicability of exemption (4) of this statute to information contained in grant files. Exemption (4) allows agencies to withhold information that would disclose "trade secrets and

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34. 1987 GAO REPORT, *supra* note 20, at 13.

35. Telephone interview with Dr. Iris Obrams, Branch Chief for Extramural Programs, Epidemiology and Biostatistics Division, NIH (Nov. 2, 1990).

36. NATIONAL INSTITUTES OF HEALTH, MANUAL 4513: REVIEW OF NIH PROGRAMS AND GRANT AND COOPERATIVE AGREEMENT APPLICATIONS 2 (1982).

37. NIH MANUAL 4510. *supra* note 24, at 8.

38. UNITED STATES PUBLIC HEALTH SERVICE, PHS GRANTS POLICY STATEMENT 15 (1987).

39. 504 F.2d 238 (D.C. Cir. 1974), *cert. denied*, 421 U.S. 963 (1975).

commercial or financial information obtained from a person and privileged or confidential."<sup>40</sup> NIH believes that, given the recent trend toward commercialization of government-sponsored research, a good case can usually be made for withholding much of the contents of a grant application under this exemption. The vitality of this argument has yet to be tested in the courts.<sup>41</sup> Furthermore, NIH takes the position that information contained in summary sheets (including priority scores), transcripts and summaries of peer review meetings and outside reviews that constitute opinion, rather than purely factual information, comes within exemption (5) of FOIA, which applies to internal agency communications.<sup>42</sup>

The initial application forms advise all potential applicants of their Privacy Act rights. Pursuant to the Privacy Act, NIH routinely provides all applicants with staff-prepared summaries of both written reviews and panel minutes (with priority scores attached) after the completion of the panel review process and prior to submittal of the application to the relevant Advisory Council.<sup>43</sup> NIH regards this as an important source of feedback for future applications and re-submittals of declined applications.<sup>44</sup> Applicants can obtain copies of the actual reviews (called pink sheets) with certain information redacted (e.g., the identities of the reviewers and panelists).<sup>45</sup> Transcripts and complete minutes of panel meetings are not available. For the most part, applicants seem to trust the staff summaries and do not request original documents.<sup>46</sup> The pink sheets contain the identities of all panel members, but the identities of the panelists who wrote the primary and secondary reports to the study section and other outside reviewers are not disclosed to the Program

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40. 5 U.S.C. § 552(b)(4) (1988).

41. The argument has a surface implausibility. If the applicants are willing to have the information in their grant applications viewed by peer reviewers, some of whom may be direct competitors, it is hard to see how it could be maintained that the information is a trade secret. See generally Thomas O. McGarity & Sidney A. Shapiro, *The Trade Secret Status of Health and Safety Testing Information: Reforming Agency Disclosure Policies*, 93 HARV. L. REV. 837 (1980).

42. 5 U.S.C. § 552(b)(5) (1988) (exemption for inter-agency or intra-agency memoranda or letters which would not be available by law to a party other than an agency in litigation with the agency).

43. Memorandum from Associate Director for Extramural Research and Training, NIH, to Distributees, re: Routine Release of Summary Statements following National Advisory Councils and Boards (Aug. 24, 1978). When the Advisory Council takes a position different from that recommended by the review panel, the package to the applicant must include a letter indicating the Council's decision and a supporting rationale. *Id.*

44. NATIONAL INSTITUTES OF HEALTH, MANUAL 4512: SUMMARY STATEMENTS 4 (1982).

45. GENERAL ACCOUNTING OFFICE, PEER REVIEW: COMPLIANCE WITH THE PRIVACY ACT AND FEDERAL ADVISORY COMMITTEE ACT 7 (1991).

46. *Id.* at 7. NIH receives fewer than ten Privacy Act requests per year. *Id.*

Directors or the applicants, and their written and oral comments are not otherwise revealed to applicants or the public.<sup>47</sup>

Each potential reviewer must fill out a financial disclosure statement that reveals the extent of that person's financial interests in various institutions and companies. NIH conflict of interest regulations and guidelines prevent a panel on which a reviewer sits from considering the reviewer's application or an application from the reviewer's spouse, parent, child, partner, or close professional associate. In addition, a panelist must leave the meeting when the panel is considering an application from the panelist's own organization or an organization with which the panelist is negotiating for future employment.<sup>48</sup> The guidelines urge all reviewers to avoid the appearance of a conflict of interest by refraining from participating in the evaluation of applications involving a recent student, a recent teacher or a close personal friend. Finally, reviewers "should not participate in the review of an application from a scientist with whom the reviewer has had long-standing differences which could reasonably be viewed as affecting objectivity."<sup>49</sup> The Director of NIH may waive these guidelines and prohibitions "if he or she determines that there is no other practical means for securing appropriate expert advice on a particular grant application . . ."<sup>50</sup> Except for a terse but foreboding reference to "relevant provisions of title 18 of the United States Code, relating to criminal activity," the regulations and guidelines do not provide any sanctions for breach of their provisions.<sup>51</sup>

Applicants have a limited right to request reconsideration of panel determinations prior to review by the Advisory Councils.<sup>52</sup> Pursuant to the Privacy Act, applicants may demand that the agency correct any information on the pink sheets that is not accurate, relevant, complete or timely prior to submitting the applications to the Advisory Council. The rejected applicant must first consult with the Program Director, who in turn refers any written rebuttals to the primary and secondary reviewers to correct any factual errors in their evaluations of the proposal. Obvious factual errors can be corrected before the group of applications goes to the Advisory Council. Rejected applicants may also argue that the study section did not contain any scientist with sufficient expertise in the

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47. NATIONAL INSTITUTES OF HEALTH, MANUAL 4514: ROLES OF STAFF AT ADVISORY COMMITTEE MEETINGS AND EXCHANGE OF INFORMATION BETWEEN INITIAL REVIEW GROUPS AND BUREAUS, INSTITUTES, AND DIVISIONS 6 (1982).

48. 42 C.F.R. § 52h.5(b) (1993); *see also* NATIONAL INSTITUTES OF HEALTH, MANUAL 1805: USE OF ADVISORS IN PROGRAM AND PROJECT REVIEW AND MANAGEMENT 5-6 (1982) [hereinafter NIH MANUAL 1805].

49. NIH MANUAL 4510, *supra* note 24, at 7; NIH MANUAL 1805, *supra* note 48, at 5-6.

50. 42 C.F.R. § 52h.5(c) (1993).

51. *Id.* § 52h.5(a).

52. Applicants must follow formal rebuttal procedures. They are not allowed to communicate with Council members concerning funding matters. Council members must fill out a standard form if applicants ever attempt to communicate with them about funding matters. According to one interviewee who declined to speak for attribution, this sort of contact almost never happens in NIH.

relevant scientific field. However, NIH takes the position that "[m]atters of expert opinion are not subject to amendment" in light of Privacy Act responses.

When the Program Director is persuaded that the study section made a mistake on a matter of opinion, such as the overall importance of the project, the Director usually urges the applicant to resubmit the application to a different study section or to request a referral officer in the Division of Research Grants to appoint an ad hoc study section, rather than continue to resubmit to the same committee. If the Program Director is not convinced that a mistake was made but thinks that the project deserves funding, the Director normally advises the rejected applicant on how to improve the application for submission in a future funding cycle.

The staff informs the Advisory Councils of any rebuttals that applicants file. Rebuttal letters can have an impact on a Council's rankings in cases of miscalculations or misinterpretations of a researcher's qualifications, but the Councils do not normally pay attention to differences of scientific opinion, as they are disinclined to second guess the experts who have spent more time evaluating the merits of the proposals. Most of the scientist members on the Advisory Councils were previously study section members, and they know that too many reversals could have an impact on the willingness of study section members to serve in the future.

After the relevant Advisory Council has completed its review of the proposals, mid-level NIH staffers (usually Branch Chiefs) ascertain from the agency's budget office the rough percentage of proposals that may be funded, and they meet to draft final recommendations to the Institute's Director. At these meetings, Branch Chiefs can compete with one another for additional funding "by exception" from the previously mentioned pool of funds set aside at the outset. The Branch Chiefs can also change the ranking of proposals at the margins. The goal of these meetings is to look at the broad picture and present the Director with a recommendation defensible to the outside world, which includes rejected applicants and interested congresspersons. The final decisions are usually made by executive committees composed of the Institute's Director and the directors of the various divisions within the Institute.

NIH has promulgated procedures for challenging initial review recommendations. The agency recognizes that applicants may appeal decisions not to fund for several reasons, including "perceived insufficient expertise on the initial review group . . . or conflict of interest on the part of one or more of its members; apparent factual or scientific errors, oversights, or bias associated with the review of an application at the initial or advisory council review; and possibly inappropriate handling of the review or of the application."<sup>53</sup> However, the appeals process "is not intended to resolve purely scientific disputes between peer

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53. 14 NATIONAL INSTITUTES OF HEALTH, GUIDE FOR GRANTS AND CONTRACTS 1 (1985) [hereinafter NIH GUIDE].

reviewers and the investigator; to provide a mechanism for allowing investigators to submit information that should have been presented in the original proposal; or to provide a forum for disputing priority score determinations in the absence of specific and substantive evidence pointing to a flawed review."<sup>54</sup> In practice, appeals are usually only taken in cases of terminations of ongoing grants. Appeals must be taken to the Review Officer in the Office of the Director, but initial review panels and Advisory Councils are usually asked to participate in the resolution of the appeal. Actions that the Director may take in the case of valid appeals include "rereview by the same or another initial review group; special consideration by the advisory council; or administrative action authorized by the Institute Director or staff."<sup>55</sup> There is no procedure for appealing final funding decisions.

## B. The National Science Foundation

Congress created the National Science Foundation (NSF) in 1950 to promote and advance science in the United States.<sup>56</sup> Whereas NIH focuses almost exclusively on research related to human health, NSF supports research across many areas of the physical, natural and social sciences.<sup>57</sup> Because NSF does not have its own research facilities, nearly all NSF-supported research is conducted in university laboratories and laboratories administered by university consortia. NSF also sponsors a relatively small amount of research in laboratories run by other government agencies (e.g., the Argonne National Laboratory and the Los Alamos Scientific Laboratory) and, more recently, at for-profit laboratories. NSF distributes more than two billion dollars annually to more than 17,000 grantees.<sup>58</sup> During the 1980s, NSF experienced a 40 percent increase in applications for research grants, while its funding

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54. *Id.*

55. *Id.*

56. The National Science Foundation was established by the National Science Foundation Authorization and Science and Technology Equal Opportunities Act, Pub. L. No. 96-516, 94 Stat. 3007 (1980) (codified at 42 U.S.C. §§ 1861-75 (1988)). Congress provided additional authority in Title I of the Education for Economic Security Act, Pub. L. No. 98-377, 97 Stat. 1268 (1984) (codified at 20 U.S.C. §§ 3911-22 (1988)), and the Science and Engineering Equal Opportunities Act, Pub. L. No. 100-570, 102 Stat. 2870 (1988) (codified at 42 U.S.C. §§ 1885-85d (1988 & Supp. 1992)).

57. The interviews upon which this description is based focused upon two of the many NSF funding programs: the Program on Biotic Systems and Resources in the Directorate of Biological Sciences and the Program on Science and Technology Centers in the Directorate of Major Initiatives and Other Activities. All of the programs follow the same basic funding model.

58. NATIONAL SCIENCE FOUNDATION, GUIDE TO PROGRAMS FY 1991, at iii (1991) [hereinafter 1991 NSF PROGRAM GUIDE].

remained relatively flat.<sup>59</sup> Fewer than 45 percent of the principal investigators who apply to NSF for funding are successful.<sup>60</sup>

The National Science Board (NSB), composed of twenty-five persons (usually prominent scientists, engineers, and occasionally public figures with an interest in science) appointed for six-year terms by the President with the advice and consent of the Senate, is the primary policymaking body of the NSF. The NSB must approve most new programs and nearly all grants or contracts totaling more than six million dollars or involving annual expenditures of more than \$1.5 million.<sup>61</sup>

An applicant for NSF funding may address a proposal to a Program in any one of the agency's eight broad Directorates.<sup>62</sup> Most grant applications come from educational institutions or consortia of educational institutions, a few come from for-profit companies (mostly small businesses), and a smattering come from individuals. Project grant funds may be used for all costs necessary to conduct research, including salaries and wages, permanent equipment, expendable equipment and supplies, travel, publication costs, and other direct and indirect costs. Although nearly all NSF grants result from a process involving peer review, the agency recently established a procedure under which a Program can award up to five percent of its budget in small grants of not more than \$50,000 on an expedited basis without peer review.<sup>63</sup>

General criteria for evaluating proposals include: (1) research performance competence (the capability of the investigator, the technical soundness of the proposed approach, and the adequacy of the institutional resources available); (2) intrinsic merit of the research (the likelihood that the research will lead to new discoveries or fundamental advances within its field); (3) utility or relevance of the research (the likelihood that the research can contribute to the achievement of a goal that is extrinsic or in addition to that of the research field itself, and thereby serve as the basis for new or improved technology or assist in the solution of societal problems); and (4) effect of the research on the infrastructure of science and engineering (the potential of the proposed research to contribute to better understanding or improvement of the

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59. MERIT REVIEW TASK FORCE, NATIONAL SCIENCE FOUNDATION, REPORT OF THE MERIT REVIEW TASK FORCE 6 (1990) [hereinafter MERIT REVIEW REPORT].

60. Defining a successful principal investigator as one who has received at least one award during a three year period, the success rate dropped from 45% to 42% from the 1980-82 to the 1987-89 period. *Id.* at 12.

61. See 1991 NSF PROGRAM GUIDE, *supra* note 58, at vii.

62. The Directorates of NSF are: Biological Sciences; Computer and Information Science and Engineering; Education and Human Resources; Engineering; Geosciences; Mathematical and Physical Sciences; Scientific, Technological, and International Affairs; and Major Initiatives and Other Activities. *Id.* at v-vi. Each Directorate in turn contains many Programs, each of which is responsible for funding a particular area of research.

63. See David Bjerklie, *Fast-track Grants: National Science Foundation's Small Grants for Exploratory Research*, 93 TECH. REVIEW 19 (1990).

quality, distribution, or effectiveness of the nation's scientific and engineering research, education, and manpower base).<sup>64</sup>

The NSF peer review process does not rely as heavily upon panels as the NIH system, and it assigns considerably more discretion to the staff. For this reason, the role of peer review varies from program to program within NSF.<sup>65</sup> The staff Program Officer undertakes a preliminary assessment of a proposal's subject matter and attempts to identify a group of up to ten qualified peer reviewers from among those persons in the country with expertise in the subject matter.<sup>66</sup> Program Officers use several resources for identifying reviewers, "ranging from lists of reviewers suggested by the applicants or current peer reviewers themselves, to contacts made by NSF staff at professional meetings."<sup>67</sup> The most frequently relied upon source of reviewers is a computerized list compiled and maintained by NSF staff that contains the names of thousands of potential reviewers, arranged according to areas of expertise.<sup>68</sup> Program officers attempt to select reviewers on the basis of their expertise, objectivity, open-mindedness, and (in the case of reviewers who may be assigned to panels) ability to work with others.

Most peer reviews in NSF are "mail reviews" in which the Program Officer sends to approximately ten proposed reviewers a copy of the application and a document setting out the review criteria. The letter asks the recipient to provide a written critique of the application and a rating based on the identified criteria. Since each mail reviewer receives only one of the applications in a given pool, the reviewer has no opportunity to compare it with competing applications. Usually about five or six of the ten proposed reviewers respond to the request.

About one-third of the applications also undergo a panel review. Some Programs (e.g., biology) rely quite heavily upon panels, whereas others (e.g., chemical and physical sciences) use panels only rarely, and only for especially complicated or expensive proposals. In a panel review, the assembled experts (usually eight to fifteen in number) read the mail reviews and attempt to evaluate all proposals in a given pool.<sup>69</sup> Programs making very large awards also require site visits by peer

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64. 1991 NSF PROGRAM GUIDE, *supra* note 58, at ix.

65. Telephone interview with Dr. Garth Redfield, Associate Program Manager for Ecology Programs, NSF (Oct. 17 & Oct 24, 1990) [hereinafter Redfield Interview].

66. In 1985 NSF asked almost 60,000 persons to serve as external peer reviewers. 1987 GAO REPORT, *supra* note 20, at 14.

67. *Id.*

68. Redfield Interview, *supra* note 65.

69. About one-third of all proposals to the NSF are reviewed by mail reviewers only. Another third are reviewed exclusively by panels of reviewers who gather, usually in Washington, to deliver and discuss their advice. The remaining third are reviewed first by mail reviewers expert in the particular field, and then by panels, usually with more diverse expertise, who help the NSF decide among proposals from multiple fields or subfields. Letter from Charles H. Herz, General Counsel of the National Science Foundation, to Eric R. Glitzenstein, Esq. (Mar. 12, 1990) (on file with author) [hereinafter Herz Letter]. These proportions can vary from Program to Program.

review panels. Like NIH, the panels usually allocate the work load by assigning each application to a subcommittee of two or three persons who are primarily responsible for evaluating that application. The panelists are normally invited to rank the proposals.

After the individual and/or panel reviews have been completed, the Program Officer evaluates and ranks the proposals, taking into account the peer evaluations of the technical merit of the proposals and other factors of a less scientific nature such as "infrastructure"<sup>70</sup> and "equity"<sup>71</sup> concerns. When proposals have been submitted to a panel, the Program Officer must provide a written justification for any deviations from the panel's recommendations. In practice, there is a high correlation between panel recommendations and funding decisions.<sup>72</sup> The Program Officer's decisions are in turn reviewed by section heads and in some cases by the head of the Directorate, whose considerations include long-term political concerns, technological innovation, potential for practical application in the private sector, geographical equity in the distribution of funds, and overall scientific merit. On very rare occasions, upper level decisionmakers appoint advisory committees to provide input into the decision. Decisions to award grants of more than \$1.5 million per year must be reviewed by the NSB, the ultimate decisionmaker at NSF.<sup>73</sup> The entire process normally takes about five to nine months for individual research grants<sup>74</sup> and about ten to twelve months for major institutional grants.<sup>75</sup>

The unique multi-tier peer review process that NSF has developed for awarding grants in the Science and Technology Research Centers Program departs from the process described above because the awards in this Program are very large and last for at least five years. The review begins with the appointment of a multi-disciplinary fifteen member "external peer review committee" to advise the staff during the entire funding cycle. After receiving all of the applications, the agency staff divides them into specific "buckets" (categories) according to discipline. Each bucket is distributed to a separate panel of experts assembled for the purpose of reviewing applications and outside reviews of applications. Program Directors from the programs that deal with the subject matter of the applications collectively appoint the panel members. The Program

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70. According to one Program Officer, if a solid and consistent performer may lose his or her laboratory as a result of a decision not to fund an uninspiring application, the program officer may give the application a somewhat higher priority to "save" the laboratory as an infrastructure resource. Redfield Interview, *supra* note 65.

71. Program officers must pay attention to whether minorities, women, and young investigators are fairly represented and to the geographic distribution of the awards. Interview with Charles H. Herz, General Counsel of the National Science Foundation, and Powell, an attorney in the office of the general counsel of the NSF (Mar. 13, 1992) [hereinafter Herz & Powell Interview].

72. Stephen Cole et al., *Chance and Consensus in Peer Review*, 214 SCIENCE 881 (1981).

73. 1987 GAO REPORT, *supra* note 20, at 11.

74. OMB CATALOG, *supra* note 18, at 799. Herz & Powell Interview, *supra* note 71.

75. OMB CATALOG, *supra* note 18, at 808.

Directors also identify eight to ten outside "mail reviewers" for each proposal, whom they contact by telephone to request their assistance in the reviews. This assures about a ninety percent response rate. One of the outside reviewers is also a panel member.

Two or three panel members are responsible for detailed review of each application. The panels then assemble for two days to discuss the proposals. Since the agency cannot realistically attempt more than thirty site visits,<sup>76</sup> each panel is told to recommend no more than three or four proposals for further consideration. This usually represents only about ten to fifteen percent of the applications considered by the panel. The staff may add an additional six to eight proposals to the pool recommended by the panels for a total of thirty. This latter step is an attempt to provide some flexibility to allow for any unevenness in the quality of the proposals across the six panels. It also gives the staff some discretion to overrule panel decisions. The applications are then forwarded to the original fifteen member external peer review committee for discussion and a determination of which facilities will receive site visits.

At this point, the agency informs all applicants of the results of the process. Applicants receive verbatim copies of all mail reviews (with reviewers' identities redacted) and copies of the summaries of the panel meetings relevant to their proposals. The panel summaries are intended to give the applicants some idea of how their proposals fared in relation to others considered by the panel. Typically, the panel summary is drafted by the panel member who presented the proposal to the panel, and it is circulated to the remaining panel members for suggested corrections or additions. The thirty or so applicants that are chosen for site visits receive the above information and a list of questions to be answered in anticipation of the site visit. They are also invited to comment on the mail reviews and panel summaries. Finally, the thirty remaining applicants must provide two-page updates of their proposals to identify any changes that may have occurred since their original proposals were submitted. At this time, applicants may also make changes in priorities and in their budgets.

Site visits are conducted by teams of approximately eight members consisting of one or two members of the peer review panel that reviewed the original proposals, one or two staff members, one member of the fifteen member external review committee, and several other scientists with expertise in the relevant area. The site-visit team first reviews all of the information on file about the proposal, including the institution's response to any questions posed by the external peer review committee. After meeting with officials and researchers at the applicant institution for two days, the site-visit team prepares a five to six page report discussing the strengths and weaknesses of the proposal with respect to

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76. This conclusion was based on the experience of the first Science and Technology Center competition. Herz & Powell Interview, *supra* note 71.

the quality of the researchers, depth of institutional support and overall educational climate at the institution. The site-visit team must answer questions posed by the external peer review committee and identify the strengths and weaknesses of the application, but it is not supposed to recommend whether the proposal should or should not be funded. Because the agency staff has some fears that site-visit teams will become "cheerleaders" for the sites that they visit, they request that the reports be as dispassionate and objective as possible.

The external peer review committee, which has by now been expanded from fifteen to twenty-five members to lend additional expertise, must then review the site visit reports. Each panel member receives a large binder with an abstract, executive summary, budget and the reviews of each of the thirty proposals, but subcommittees of three reviewers provide intensive analyses of individual proposals. Because it is virtually impossible to ensure that no member of the committee participates in the evaluation of an application from his or her own institution, each member is assigned to one of two groups, each of which evaluates all of the proposals. The staff ensures that the first group to consider a proposal does not contain a representative from the institution that submitted it. All members must excuse themselves from any meeting in which the panel is evaluating proposals from their own institutions. Each group must rank all of the proposals and choose the top seven to ten. On the second day of the meeting, the groups exchange rooms, and each reviews the work of the previous group to determine whether it agrees with the prior group's rankings. On the third day, the committee attempts to arrive at a consensus on about seventeen to twenty proposals that deserve funding. The Director of the Science and Technology Center Directorate then recommends ten to fifteen from among those proposals for presentation to the National Science Board.

One NSF staffer from another program suggested that the peer review process in place at the Science and Technology Centers Program is "the best in the world."<sup>77</sup> There can be little doubt that it is in fact one of the most thorough and complex peer review systems in the world. The redundant layers of peer review are justified by the large sums of money at stake and the temptation that would otherwise exist to fund centers in a biased fashion on the basis of criteria other than scientific merit.

NSF has prescribed detailed conflict of interest regulations for persons employed by NSF, including members of the NSB. These regulations prevent present and past employees from representing anyone dealing with any federal official in any matter in which they were involved at NSF.<sup>78</sup> They also prohibit NSF employees' personal involvement in the handling of any proposal or other matter in which the employee, a member of the employee's immediate family, or an organization of which the employee is a part or may become a part has a

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77. Redfield Interview, *supra* note 65.

78. 45 C.F.R. § 684.14 (1993).

financial conflict of interest.<sup>79</sup> Finally, NSF's regulations provide that persons employed by NSF who have access to information not generally available to the public may not use that information for their private benefit or for the private benefit of others.<sup>80</sup> A member of the NSB may not participate in deliberations that would affect the member's own interests, those of a close relative, or those of an institution with which the member or close relative has any of several designated affiliations.<sup>81</sup>

A separate set of regulations applies to outside peer reviewers. Each peer reviewer must reveal any possible conflicts of interest that the he or she may have.<sup>82</sup> The regulations define "potentially biasing affiliation or relationship" by reference to several kinds of relationships.<sup>83</sup> In addition to employment-type affiliations and family relationships, the term includes "[a]ny other relationship, such as a close personal friendship, that [the reviewer] think[s] might tend to affect [his or her] judgments or be seen as doing so by a reasonable person familiar with the relationship."<sup>84</sup> Panelists must disclose all such potentially biasing affiliations or relationships to the Program Officers.<sup>85</sup> Most of the relationships are "automatically disqualifying," but some are only "partially disqualifying."

The NSF procedure for making information available to applicants and the public and for allowing rebuttals and challenges to non-funding decisions have evolved over the last several years from a relatively closed and unresponsive system to a comparatively open one. This evolution was nudged along by a petition from a researcher who, with the support of a Ralph Nader-affiliated public interest organization called Public Citizen, had the persistence to prove that the system had wronged him and the courage to demand that the agency ensure that what happened to him would not happen to future researchers.<sup>86</sup>

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79. *Id.* § 684.16.

80. *Id.* §§ 684.11(h), 684.17(a).

81. *Id.* § 684.21. The proscribed affiliations include current employment, formal arrangements for future employment, employment as an adjunct professor.

82. *Id.* § 681.25(a).

83. "Affiliations with an applicant institution" include current employment or being under consideration for employment with the relevant institution, holding an office or membership on the governing board of the applicant institution, ownership of the institution's stock, current enrollment as a student in the institution (but only with respect to applications from the student's department), and receipt of an honorarium or award within the last twelve months. Relationships with investigators that have a personal interest in the grant include marriage, business partnership, past or present association as a thesis advisor or thesis student, and collaboration on a project within the last forty-eight months. *Id.* § 681.21(a).

84. *Id.* § 681.21.

85. *Id.* § 681.25.

86. NSF attorneys deny that any significant change occurred as a result of the Nader-sponsored Kalb rulemaking petition described below. Noting that the Kalb petition was unique in the history of NSF, they maintain that the agency had already adopted and had been implementing nearly all of the changes that Kalb demanded in his petition. They contend that in many ways (e.g., the ability of the applicant to read the actual written

In the late 1970s, Jon Kalb applied for a grant from NSF to continue his anthropological research in Ethiopia.<sup>87</sup> Kalb's research, for which he held an exclusive concession from the Ethiopian government, was the subject of three separate proposals by principal investigators from Southern Methodist University, New York University and Harvard University. Kalb later learned that the NSF staff had informed the peer reviewers for all three of these proposals of rumors that Kalb was associated with the Central Intelligence Agency (CIA) and that his scientific efforts were merely a cover for covert CIA activities in Ethiopia. Kalb alleged that one source of the rumors was a reviewer assigned to his grant application, who in turn learned of them from the head of a rival research group. In fact, one of the reviewers of the Harvard proposal wrote the following in his review: "The qualifications of the senior personnel are beyond question and this reviewer is fully in sympathy with Mr. Kalb's efforts and energy in getting the [project] together. However, his possible involvement with the CIA must, until this has been cleared up, remain a matter of concern for any scientists."<sup>88</sup> The scientist who wrote this review had hoped to become a collaborator at Kalb's site, but Kalb had declined his overture just a few weeks before the review was written. It is reasonably clear from attempts to reconstruct the meetings of the peer review panels that Kalb's alleged involvement with the CIA was a prominent consideration in the panels' deliberations, even though it was never mentioned in the written minutes of those meetings.<sup>89</sup> After all three applications were rejected and after Kalb and his family were expelled from Ethiopia as a result of the rumors, the reviewer who brought the rumors to the attention of one of the panels applied for and received an amendment to an existing grant allowing him to use NSF monies to take over the concession that the Ethiopian government had previously awarded to Kalb.<sup>90</sup>

Kalb attempted to challenge the decision not to fund his project, but he was blocked at every turn by the secrecy that NSF demanded for the peer review process and by the staff's general lack of responsiveness. After ten years of challenges, during which he attempted to demonstrate that the rumors were false and that they had affected the decision on his proposal, Kalb finally sued the agency. The lawsuit resulted in a

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reviews of the reviewers), the NSF system has always been more open than the NIH system. Many NSF staffers believed that the Kalb petition was "making a mountain out of a molehill," because nearly all of the information that Kalb requested would have been available to him without his reliance on the Privacy Act. Herz & Powell Interview, *supra* note 71.

87. The proposal was submitted jointly by Kalb and researchers from Southern Methodist University and New York University. The story of the Kalb petition is related in greater detail in ROBERT BELL, *IMPURE SCIENCE: FRAUD, COMPROMISE, AND POLITICAL INFLUENCE IN SCIENTIFIC RESEARCH* ch. 1 (1992).

88. *Id.* at 21.

89. *Id.* at 16-20.

90. *Id.* at 22-23.

settlement under which NSF issued a formal apology to Kalb and paid his attorneys' fees of approximately \$20,000.<sup>91</sup>

Not long after the settlement, Kalb and Public Citizen filed a petition with NSF asking the agency to write new procedures, pursuant to the Privacy Act<sup>92</sup> and the Federal Advisory Committee Act,<sup>93</sup> for providing applicants with access to information concerning their applications and for giving them a realistic opportunity to rebut any false allegations made during the review process. Unlike NIH, NSF had not officially maintained a "system of records" for retrieving information about an individual by name or personal identification number, and it therefore had not subjected its peer review proceedings to the Privacy Act. Kalb's attorneys argued that the agency had maintained a de facto "system of records" in violation of the Privacy Act. Acknowledging that the peer review system must be kept confidential from grant applicants to ensure frank and candid opinions and that peer reviewers who offer evaluations must therefore remain anonymous, the petition maintained that NSF had gone far beyond what was reasonably necessary to ensure the confidentiality of the review process. Kalb demanded that NSF "amend its procedures to ensure that grant applicants have sufficient access to and the opportunity to amend, records regarding the consideration of the grant proposals."<sup>94</sup>

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91. See Boyce Rensberger, *NSF Admits Spreading Spy Rumor: Agency Apologizes To Grant Applicant*, WASH. POST, Dec. 4, 1987, at A25.

NSF attorneys maintain that the payment of attorneys' fees was solely for the purpose of eliminating the "nuisance value" of the lawsuit and in no way constituted an admission that the agency had wronged Kalb in any way. In particular, NSF attorneys maintain that the rumors that Kalb was working for the CIA did not affect the outcome of the agency's treatment of Kalb's proposal. Herz & Powell Interview, *supra* note 71.

92. 5 U.S.C. § 552b (1988). The Privacy Act requires federal agencies to protect personal information in agency files from unauthorized disclosure, to publish descriptions of the existence and nature of the records containing personal information about people, and to give individuals access to review and copy information about themselves and to demand that the agency correct any information that is not accurate, relevant, complete or timely. The Act, however, only applies to "systems of records" from which records are retrieved by the name of an individual or other personal identifier. This latter qualification has proven controversial and difficult to interpret.

93. *Id.* app. § 2. The Federal Advisory Committee Act requires federal agencies that rely upon recommendations of advisory committees to charter those committees. The charter must set out the committee's objectives, duties, number and frequency of meetings, and termination date. The agency must prepare minutes for advisory committee meetings and make those minutes available to the public, subject to the exemptions in the Freedom of Information Act.

94. Petition For Rulemaking, from Jon Kalb, to the NSF (July 13, 1989) (on file with the author). The petition demanded that NSF correct four alleged basic flaws in its peer review system:

- (1) applicants are being deprived the right to gain access to, and the opportunity to amend, vital information considered in the peer review process;

The petition first urged NSF to make information in review files available to applicants along the lines of the NIH model and to inform applicants of their Privacy Act rights. Second, the petition demanded that applicants be given access to the contents of all outside reviews prior to any final decisions on their applications. Third, it asked NSF to comply with its Federal Advisory Committee Act obligation to make complete minutes, rather than staff summaries, of peer review panel meetings available to applicants. Fourth, the petition insisted that NSF adopt special procedures to give each applicant an opportunity to learn about and rebut derogatory, harmful or non-scientific information and allegations of misconduct before the final decision regarding that applicant's grant proposal. Fifth, the petition requested that NSF adopt a procedure for allowing applicants to play a role in guarding against research conflicts of interest.<sup>95</sup> Since allowing applicants to play a role in identifying potential conflicts of interest might threaten the confidentiality of the reviewers' identities, the petition suggested that NSF could make available a list of potential reviewers to applicants in advance and allow applicants to object to any listed scientists that might have a research conflict of interest. Finally, the petitioners asked NSF to amend its appeals process to make it more accessible to rejected applicants.<sup>96</sup>

On March 12, 1990, NSF responded to the petition. Rejecting most of the petition's allegations, the agency noted that it had already adopted most of the petitioners' suggestions.<sup>97</sup> Without conceding that it had maintained a de facto "system of records," the agency agreed to continue making all reviews, notes of telephone conversations with reviewers, and summaries of the contents of any panel meetings available to applicants after the agency's final decision. Only the names of reviewers and the contents of competing proposals would be redacted. Applicants would

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- (2) applicants are not afforded advance notice of, and an opportunity to rebut non-scientific derogatory information prior to final decision-making;
  - (3) applicants do not have the opportunity to prevent conflicts of interest by those involved in the review and evaluation process; and
  - (4) the appeals process is woefully inadequate.

*Id.*

95. The petitioners pointed out that "[w]hile NSF's rules recognize the need to guard against traditional, financial, institutional, and personal conflicts of interest, they say nothing about the kinds of conflicts that may be of even greater concern to scientists—direct conflicts of interest regarding the specific research covered by a particular proposal." *Id.* at 26. The petitioners noted that "[t]here is obviously a great potential for bias if a scientist that is asked to review a grant application is already conducting the same or very similar research to that being proposed by the grant applicant, particularly if the reviewer believes that the proposed research may, if funded, somehow preempt or hinder his own work." *Id.*

96. The petitioners offered the NIH appeals process as a model. *Id.* at 36.

97. Herz Letter, *supra* note 69. For example, with the exception of telephone notes, all of the listed procedures had been followed in the Directorate of Biological Sciences for almost a decade prior to the Kalb petition. Redfield Interview, *supra* note 65.

automatically receive written reviews and summaries of panel meetings. NSF further agreed to make greater efforts to inform applicants of their Privacy Act rights.

However, the agency refused to establish an additional process for allowing applicants to rebut nonscientific statements and innuendo prior to final awards decisions. Noting that it had already adopted a policy prohibiting staff or panel consideration of reviews demonstrating bias or containing personal attacks, NSF determined that it would be too burdensome to provide a formal rebuttal opportunity to all disgruntled applicants.<sup>98</sup> The agency alluded to the difficulty of distinguishing rebuttals based upon alleged bias from rebuttals attacking the scientific merits of the reviews and rankings. NSF noted that rejected applicants could submit petitions for reconsideration after the fact if they believed that they had been the object of animus.

To avoid research conflicts of interest, NSF agreed to provide computerized rosters of all potential reviewers to applicants, to invite applicants to suggest the names of persons who might be biased against their proposals, and to give this invitation prominence by making it part of the agency's standard acknowledgment letter. Although the agency did not commit itself to follow applicants' suggestions, it anticipated that most would be honored.<sup>99</sup> However, it declined to disclose the names of potential reviewers that it decided to disqualify.

With respect to appeals, NSF noted that its recently implemented Privacy Act procedures would provide all applicants an opportunity to correct any errors in their application jackets after the fact by asking for reconsideration. The agency agreed, however, to amend its regulations to clarify that motions for reconsideration would not be restricted to procedural grounds, but could also address bias, conflict of interest, and the scientific merits of the decision.<sup>100</sup>

The extent to which NSF's response to the Kalb petition represents a departure from past policies and practice is hotly disputed. The agency's general counsel strongly believes that the agency had already implemented nearly all of the changes that Kalb demanded. Kalb and his attorney just as strongly disagree and argue that it was preferable, in any

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98. The agency explained:

[W]e concluded that the costs of such a formal and automatic process would outweigh the benefits. Among the costs would be weeks or months of delay in the review of every proposal, thousands of hours of effort by principal investigators, similar demands on the time and energy of already stressed NSF program staff (with consequent sacrifice of other services to the scientific community and the public), and frustration all around when little changes as a result.

Herz Letter, *supra* note 69, at 9-10.

99. *Id.* at 13.

100. *Id.* at 15. This change was implemented in July 1990. NATIONAL SCIENCE FOUNDATION, IMPORTANT NOTICE TO PRESIDENTS OF COLLEGES AND UNIVERSITIES AND HEADS OF OTHER NATIONAL SCIENCE FOUNDATION GRANTEE ORGANIZATIONS, NOTICE NO. 109 (1990) [hereinafter NOTICE TO PRESIDENTS].

event, to formalize the changes in rules and guidelines. Although the potential for bias in NSF's peer review process is lower than a decade ago, it still exists, and the system can still be improved.

### C. The Environmental Protection Agency

The United States Environmental Protection Agency (EPA) is one of the largest regulatory agencies in the United States with more than 10,000 employees in its Washington, D.C. headquarters, its ten regional offices and several research laboratories throughout the country.<sup>101</sup> Unlike NIH and NSF, EPA's functions are primarily regulatory in nature; it writes and enforces standards aimed at protecting and enhancing the environment. EPA does, however, do research to learn more about the impacts of human activities on the environment, and it has particular research needs in its standard-setting activities. The agency attempts to identify in advance particular scientific questions that may arise in future rulemaking initiatives and to conduct research on aspects of those questions to help the regulatory staff decide how to write supportable standards. Most of EPA's research budget is devoted to its own laboratories, but the agency does support some outside research in universities, corporate laboratories and private consulting companies.<sup>102</sup>

Most external EPA-funded research is administered through the agency's Office of Research and Development (ORD), which is headed by an Assistant Administrator who is appointed by the President with the advice and consent of the Senate.<sup>103</sup> ORD funds approximately \$40 million per year in research grants<sup>104</sup> pursuant to broad criteria that do not vary greatly from those used to evaluate the scientific merit of proposals in NSF and NIH.<sup>105</sup>

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101. The primary EPA research laboratories are located in Cincinnati, Ohio and Research Triangle Park, North Carolina. EPA has smaller laboratories in Las Vegas, Nevada; Ada, Oklahoma; Athens, Georgia; Corvallis, Oregon; Duluth, Minnesota; Gulf Breeze, Florida; and Narragansett, Rhode Island. See ENVIRONMENTAL PROTECTION AGENCY, FY-1991 EPA RESEARCH PROGRAM GUIDE 127-29 (1991).

102. In 1986, for example, EPA awarded \$10.6 million for investigator-initiated research out of a total extramural budget of \$217 million for environmental and related research. AMERICAN MANAGEMENT SYSTEMS, AN EVALUATION OF EPA'S EXPLORATORY RESEARCH GRANT PROGRAM D-4 (1988) [hereinafter AMS REPORT].

103. 40 C.F.R. § 1.45 (1993).

104. OMB CATALOG, *supra* note 18, at 877. This Article will focus on the Office of Exploratory Research, one of eight offices within the Office of Research and Development, because it "is the primary contact between the Environmental Protection Agency and the environmental research community" and because it has traditionally relied heavily upon peer review in awarding research grants. STEVEN SMITH & STEVEN KLEIN, MANAGEMENT STUDY OF THE OFFICE OF EXPLORATORY RESEARCH 1 (1990); see also ENVIRONMENTAL PROTECTION AGENCY, ORIENTATION HANDBOOK FOR MEMBERS OF RESEARCH GRANTS SCIENCE REVIEW PANELS 3 (1991) [hereinafter EPA ORIENTATION HANDBOOK].

105. OMB CATALOG, *supra* note 18, at 878. The criteria are as follows:

A proposal is judged for (a) scientific merit in terms of: (1) strengths and weaknesses of the project; (2) adequacy of overall project design; (3) competency of proposed staff; (4) suitability of applicant's available

The grant selection process at EPA consists of a "dual system of review" that relies heavily upon six "Science Review Panels" established on an ad hoc basis in each of the program's six principal areas of interest.<sup>106</sup> EPA enters into a cooperative agreement with each Panel Chairperson, an outside scientist or engineer appointed to a single three-year term by the Assistant Administrator for Research and Development, to supervise the peer review process. The chairperson is responsible for selecting the members of the Panel, overseeing the Panel's scientific review of the applications assigned to it, and providing EPA staff with a Summary Statement of the Panel's recommendations for each application. With the approval of the EPA staff, the chairperson chooses twenty to sixty members for the Panel from among recognized experts in the relevant field. Panelists are compensated at the rate of \$200 per day plus transportation and per diem expenses. An EPA staffer called a "Science Review Administrator" (SRA), is an ex-officio member of the panel. The SRA's functions are to provide policy and procedural guidance and managerial assistance.<sup>107</sup>

All grant applications are initially referred to the agency's Grants Administration Division where they are reviewed for legal and administrative acceptability. They then go to the Research Grants Program for assignment to the appropriate peer review panel. The Panel Chairperson reviews them with the assistance of the SRA and assigns each application to at least three Panel members who serve as "primary reviewers" of that application. The Chairperson attempts to ensure that no panel member is the primary reviewer for more than five applications per cycle. A reviewer who believes that an application has been inappropriately assigned to him or her may return it to the Chairperson for reassignment. Each primary reviewer measures the applications against the listed criteria and prepares a written evaluation with an accompanying recommendation to approve, disapprove or defer the proposal.<sup>108</sup> All panelists receive the cover sheets and abstracts for all applications that will be considered at the upcoming meeting, and any member may request a copy of the full proposal for any application in advance of the meeting.

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resources; (5) appropriateness of the proposed project period and budget; and (6) probability that the project will accomplish stated objectives; for (b) program interest in terms of: (1) the need for the proposed research; and (2) relationship to objective(s) in an approved work plan.

*Id.* The agency's guide for peer reviewers provides that reviewers should "focus attention on the scientific merits and utility or potential utility of research proposals, the competence of the principal investigator and the adequacy of institutional facilities." EPA ORIENTATION HANDBOOK, *supra* note 104, at 2.

106. The six principal areas of interest are: chemistry and physics of water, chemistry and physics of air, engineering, biology, health, and socio/economic studies.

107. EPA ORIENTATION HANDBOOK, *supra* note 104, at 1. The Chairperson is supposed to make every effort to provide for representative geographic distribution and minority group representation on the panels.

108. *Id.* at 2-3.

Depending upon the workload and the availability of funds, the Panel meets two or three times per year. The Panel's consideration of each application begins with a review of the written evaluations and recommendations prepared by the three primary reviewers. A full Panel discussion addresses each proposal's strengths and weaknesses. At the end the discussion, each panelist "independently and privately" records a numerical priority score ranging from 0 to 100 reflecting the application's scientific merit.<sup>109</sup> The Panel may not recommend for funding any proposal with an average score of less than sixty, and all proposals with an average score of greater than sixty receive an automatic recommendation. The Chairman, with the assistance of the SRA, prepares a "Summary Statement" setting out the Panel's recommendation and supporting reasons. EPA staff gives the "highest consideration" to the top two to four applications from each Panel. The remainder are "selected in part on criteria other than technical merit and utility, such as program balance and budget."<sup>110</sup>

Panelists are expected to keep grant applications, review materials, and proceedings of Panel meetings in strictest confidence, and EPA's procedures forbid any direct communications concerning an application between members of the panel and applicants. In addition, the agency's Orientation Handbook for panelists speaks particularly to the issue of trade secrecy, providing that:

Panel members are . . . bound by the confidentiality of all proprietary parts of the proposals they read under this guidance; no Panelists will disclose or use to their own advantage any data, concept, research protocol, or any other idea included in the applications.<sup>111</sup>

Although the handbook is curiously silent about the confidentiality of the reviewers' identities, EPA as a matter of policy refuses to divulge the names of primary reviewers to anyone, including rejected applicants. The agency does not attempt, however, to keep the attendance list for particular panel meetings secret.<sup>112</sup> Thus, while a rejected applicant cannot ascertain the identities of the three primary reviewers, a persistent inquirer can probably find out who sat on the Panel that evaluated the proposal.

The Orientation Handbook also discusses the agency's Privacy Act obligations.<sup>113</sup> Immediately following a Panel meeting, all applicants who "failed" the review receive a rejection letter. Those whose applications "passed" the technical review receive a letter informing them of that fact

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109. *Id.* at 3.

110. *Id.* at 3-4; see also AMS REPORT, *supra* note 102.

111. EPA ORIENTATION HANDBOOK, *supra* note 104, at 5.

112. Interview with Dr. Robert A. Papetti, Director, Research Grants Staff, Office of Research and Development, EPA (Oct. 4, 1990) (commenting on an earlier draft of this Report) [hereinafter Papetti Interview].

113. EPA has also promulgated procedural regulations implementing the Privacy Act. 40 C.F.R. § 16 (1993).

and telling them that their applications are under consideration by the EPA staff. At the end of the staff review, those candidates not selected receive a second letter informing them of that fact. Five or six weeks later, every applicant receives the Chairman's summary of the Panel's technical review of his or her application.<sup>114</sup> The staff may only release the Summary Statement to the applicant. The agency later allows applicants to see all documents generated during the review process, including the reviewers' written comments, if available. However, reviewers' written comments and scores "are not retained after the substance of those materials has been incorporated into Summary Statements."<sup>115</sup>

EPA's conflict of interest requirements provide that no panelist may attend a panel meeting in which the panel evaluates his or her own grant application or the application of a close relative, friend or close professional associate. A panelist may attend a meeting at which an application from his or her institution will be considered, but must leave the room during the consideration of that application.<sup>116</sup>

EPA has established a formal appeals procedure for rejected applicants. Each Project Officer must designate a "Disputes Decision Official" from among senior EPA employees who are knowledgeable about EPA's assistance programs to review and resolve disputes over grant applications and rejections. After consulting informally with the relevant persons, the Disputes Decision Official issues a written decision from which the applicant may take an appeal to the appropriate EPA Assistant Administrator. Documentary evidence and briefs must accompany any appeal, and applicants may be represented by counsel. The Assistant Administrator's written decision constitutes the final agency action from which appeal to a court is appropriate.<sup>117</sup> When a rejected applicant asks the relevant SRA why his or her proposal was rejected or attempts to challenge the agency's decision, the SRA typically suggests that the proposal be resubmitted for consideration during the next funding cycle. The re-submittal will typically be considered by the same panel, which normally contains about half of the people who reviewed the original application.

#### D. The National Endowment for the Arts

The National Endowment for the Arts (NEA) is part of the National Foundation on the Arts and the Humanities, an independent agency that Congress created in 1965.<sup>118</sup> Its mission is to "foster the excellence, diversity and vitality of the arts in the United States," and to "help

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114. Papetti Interview, *supra* note 112.

115. EPA ORIENTATION HANDBOOK, *supra* note 104, at 5.

116. *Id.*

117. ENVIRONMENTAL PROTECTION AGENCY, ASSISTANCE ADMINISTRATION MANUAL 35-1, 35-5 (1984); *see also* 40 C.F.R. § 16.9 (1993).

118. 20 U.S.C. §§ 951-968 (1988).

broaden the availability and appreciation of such excellence, diversity and vitality," without "impos[ing] a single aesthetic standard or attempt[ing] to direct artistic content."<sup>119</sup> NEA is the institutional embodiment of a relatively brief tradition of government patronage of the arts dating back to the New Deal's Works Progress Administration.<sup>120</sup> NEA's budget has mushroomed from about \$2.5 million in 1965 to \$174 million in fiscal year 1991.<sup>121</sup> By almost any measure, NEA has been enormously successful in fostering the fine arts in the United States. On its twentieth anniversary in 1985, NEA received an Oscar for "its dedicated commitment to fostering artistic and creative activity and excellence of human genius."<sup>122</sup> However, the inevitable tensions inherent in its goals have frequently placed the agency in the public spotlight where, perhaps to a greater degree than the scientific agencies, nonprofessionals have extensively debated the pros and cons of peer review.

NEA awards discretionary grants to individual artists and nonprofit artistic organizations through peer-reviewed competitions.<sup>123</sup> In fiscal year 1989, NEA funded 4,458 of 17,879 grant applications for a total of \$153 million. Individual artists received 7.6 percent of the money, and the remainder went to organizations with matching grants. Almost ninety percent of the grants were for less than \$50,000.<sup>124</sup>

The National Council on the Arts, composed of the NEA Chairman and twenty-six other members appointed by the President with the advice and consent of the Senate, advises the Chairman with respect to policies, programs and procedures, reviews grant applications, and makes recommendations on funding decisions. Its function is therefore very much like the Advisory Councils in NIH, upon which it is apparently modeled. Its members must be citizens who "(a) are widely recognized for their knowledge of, or expertise in, or for their profound interest in, the arts and (b) have established records of distinguished service, or achieved eminence, in the arts."<sup>125</sup> As the agency has

119. NATIONAL ENDOWMENT FOR THE ARTS, GUIDE TO THE NATIONAL ENDOWMENT FOR THE ARTS 2 (1990) [hereinafter NEA GUIDE].

120. See William J. Lanquette, *The Federal Government—The Patron Saint of the Arts*, 10 NAT'L J. 1288 (1978).

121. Comments of Michael McLaughlin, Senior Staff Assistant, Office of the Deputy Chairman for Programs, and Ana Steele, Associate Deputy Chairman for Programs, on an earlier draft of this article, Sept. 17, 1991 [hereinafter McLaughlin Comments]; see also Lanquette, *supra* note 120.

122. *National Endowments for the Arts is Honored as 20th Birthday Nears*, N.Y. TIMES, Sept. 1, 1985, at 68.

123. Since awards to organizations must generally be matched from some other source, the agency can serve "as a catalyst to promote the continuing diversity, vitality and excellence in the arts in America and to provide access to, and appreciation of, such diversity, excellence and vitality." NEA GUIDE, *supra* note 119, at 2.

124. NATIONAL ENDOWMENT FOR THE ARTS, FACTS ABOUT THE ARTS ENDOWMENT (1990) [hereinafter FACTS].

125. NEA GUIDE, *supra* note 119, at 3.

expanded the range of artistic areas that it is prepared to support, the Council has become less involved in advising the Chairman with respect to individual grants and has played a broader advisory role with respect to important policy issues.<sup>126</sup>

Like NIH and NSF, NEA runs major funding programs in several broad areas, including Dance, Design Arts, Folk Arts, Literature, Media Arts (Film/Radio/Television), Museums, Music, Theater and Visual Arts, and Challenge and Advancement Grants.<sup>127</sup> Because the agency can only fund about twenty-five percent of the applications it receives, competition in all of the programs is fairly stiff.

The agency's statute provides that it award grants to individuals "of exceptional talent engaged in or concerned with the arts" for the purpose of supporting projects and productions with "substantial national or international artistic and cultural significance" that meet "professional standards or standards of authenticity or tradition, irrespective of origin, which are of significant merit and which, without such assistance, would otherwise be unavailable. . . ."128 In awarding grants, the agency must give emphasis to "American creativity and cultural diversity and to the maintenance and encouragement of professional excellence."<sup>129</sup>

The discretionary grant award process at NEA is very similar to the NIH program.<sup>130</sup> As in NIH, an NEA grant application goes through a "dual review"; it is first reviewed in one of more than 90 review panels, and then in the National Council on the Arts. Prior to submitting an application, a prospective applicant may telephone or meet with an agency staffer (called a Program Specialist) to discuss the proposed project and obtain feedback on how best to formulate the proposal.<sup>131</sup> When an application arrives at NEA, it is "logged in," a process in which basic information from the application is entered into a computer and an application number assigned, and then it is forwarded to the appropriate Program Office.<sup>132</sup> For applications requiring site visits (e.g., attending

126. INDEPENDENT COMMISSION ON THE NATIONAL ENDOWMENT FOR THE ARTS, REPORT TO CONGRESS ON THE NATIONAL ENDOWMENT FOR THE ARTS 24 (1990) [hereinafter INDEPENDENT COMMISSION REPORT].

127. The interviews upon which this description is based focused particularly upon the programs in Music, Visual Arts, and Challenge Grants.

128. 20 U.S.C. § 954(c)(1), (2) (1988 & Supp. 1992).

129. *Id.* § 954(c)(1).

130. The following discussion of the procedures in place in NEA draws on two primary sources. NATIONAL ENDOWMENT FOR THE ARTS, SUMMARY OF STEPS IN THE CURRENT APPLICATION/GRANT PROCESS (1990) [hereinafter NEA SUMMARY]; NATIONAL ENDOWMENT FOR THE ARTS, PANEL STUDY REPORT (Oct., 1987) [hereinafter NEA PANEL STUDY REPORT].

131. According to one NEA official; "We do a good bit of handholding—the applicants can come in and get help." See *supra* note 3.

132. Program Offices are often subdivided into several areas. Each area usually has a Program Director, an Assistant Program Director, and one or more Program Specialists. Each Program Specialist is responsible for several subcategories of applications. The staff's role is supposed to be purely ministerial; staffers are not supposed to become involved in substantive decisionmaking.

live performances, observing facilities, visiting with applicants, etc.), the Program Office selects outside experts to conduct the site visit and report back to the staff. However, most applications can be evaluated on the basis of other "artistic evidence," such as manuscripts, slides, and tapes.

Every major NEA Program has a Panel,<sup>133</sup> and some programs are so large that their Panels are broken down into Panel sections.<sup>134</sup> Each Panel or Panel section is composed of from five to fifteen members appointed by the NEA Chairman (usually with reliance on the Program Directors) on the basis of "expertise, aesthetic diversity, geographic dispersion, ethnic and gender representativeness, ability to serve, et cetera."<sup>135</sup> The Chairman typically chooses panelists from long lists of nominees from the Council, staff, current panel members, national artist associations, the general public, and the White House.<sup>136</sup> The agency attempts to assemble panels that "include wide diversity on many levels appropriate to each program: different artistic and programmatic viewpoints; expertise in different aspects of the art form/field (different types of creative and performing artists, arts administrators, trustees, critics, educators, large and small organizations, traditional and experimental work, etc.); experience with the field in different parts of the country, different ethnic and cultural backgrounds, and a reasonable balance of men and women."<sup>137</sup> Virtually all panels include representatives from a state or local arts agency or regional arts organization. As mandated by the 1990 amendments to the agency's statute, panels always include a member of the lay public with no particular expertise in any of the artistic areas covered by the panel.<sup>138</sup>

The peer review panel system that the NEA initiated very early in its history "marked the triumph of professional judgment over political

133. In addition to the "grant advisory panels" that the agency assembles to review and make recommendations of individual applications, it also empanels "policy advisory panels" to provide advice on "priorities, practices, guidelines and the allocation of resources for individual programs." INDEPENDENT COMMISSION REPORT, *supra* note 126, at 26. Members of policy panels have usually already served on grant panels. *Id.*

134. NATIONAL ENDOWMENT FOR THE ARTS, ARTS ENDOWMENT PANELS (1990) [hereinafter ARTS ENDOWMENT PANELS].

135. NEA SUMMARY, *supra* note 130, at 2; see also INDEPENDENT COMMISSION REPORT, *supra* note 126, at 28.

136. Comment, *Turmoil at the National Endowment For the Arts: Can Federally Funded Art Survive the 'Mapplethorpe Controversy'?*, 39 BUFFALO L. REV. 231, 254 n.113 (1991).

137. ARTS ENDOWMENT PANELS, *supra* note 134, at 2. The concern for ethnic and cultural backgrounds and balance of men and women came after "the system of deference to establish professionals came under fire for perpetrating elite domination of the cultural spheres." Comment, *Standards for Federal Funding of the Arts; Free Expression and Political Control*, 103 HARV L. REV 1969, 1974 (1990). In 1985, Congress directed that NEA select panelists "who broadly represent diverse characteristics in terms of aesthetic or humanistic perspective, and geographical factors, and who broadly represent cultural diversity." *Id.* at 1974. Arts, Humanities, and Museum Amendments of 1985, Pub. L. No. 99-194, 99 Stat. 1332, 1340 (1985) (codified at 20 U.S.C. § 960(a) (1988)).

138. See *infra* text accompanying note 309

patronage."<sup>139</sup> All potential panel members "are carefully evaluated on their professional standing as well as their ability to articulate issues confronting their field and their willingness to make the necessary commitment of time and energy to prepare for and to attend panel meetings."<sup>140</sup> In addition, "[w]hile no panel section is large enough to accommodate representatives of every conceivable aesthetic viewpoint, care is taken to ensure diversity of opinion."<sup>141</sup> The agency reconstitutes new Panels annually. Turnover rates vary from thirty-three to one hundred percent each year, and no panel member may serve for more than three consecutive years.<sup>142</sup> In all, about 800 people serve on NEA panels in any given year.<sup>143</sup>

Two to four weeks in advance of the Panel meeting, the Program Office staff sends each member of the relevant Panel or Panel section a "Panel book," containing a detailed summary of each application, the grant history of the applicant at NEA, and a brief discussion of any problems that the staff has identified. The Panel meets in Washington, D.C. for one to six days, depending upon the workload.<sup>144</sup> Panelists measure the applications against the review criteria published each year in the Program's guidelines. Some Panels divide up the work by assigning each member the role of "primary reviewer" for ten to fifteen applications. Other panels do not assign primary reviewers. One NEA staffer related that his program tried the "primary reviewer" approach, but abandoned it after discovering that the remaining panelists did very little to familiarize themselves with the applications.<sup>145</sup>

All panel meetings are tape-recorded, and the staff always takes notes. The object of the meeting is to arrive at recommendations to accept or reject each application and to suggest funding amounts for those that receive positive recommendations. Although each Panel evolves its own procedures for carrying out these evaluations, Panel meetings typically progress in five phases: "(1) presentation of material, (2) discussion of applications, (3) formulation and recording of panel judgments, (4) determination of recommended grant amounts, and (5) final review and adjustment of recommendations."<sup>146</sup> In some programs, the staff provides ballots broken down according to the review criteria, and panelists must grade each proposal on a scale of 1 to 10 or 1 to 100 for each criterion. The agency staffer responsible for averaging the scores can then identify any "outliers" in which vote spreads are very large and ask

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139. Comment, *supra* note 137, at 1973; see also Comment, *supra* note 136, at 253-54.

140. NEA PANEL STUDY REPORT, *supra* note 130, at 13.

141. *Id.*; see also INDEPENDENT COMMISSION REPORT, *supra* note 126, at 27.

142. 20 U.S.C. § 959(c)(6) (1988 & Supp. 1992).

143. FACTS, *supra* note 124; see also INDEPENDENT COMMISSION REPORT, *supra* note 126, at 25-26.

144. INDEPENDENT COMMISSION REPORT, *supra* note 126, at 30.

145. This staffer requested anonymity.

146. NEA PANEL STUDY REPORT, *supra* note 130, at 21; INDEPENDENT COMMISSION REPORT, *supra* note 126, at 30.

the Panel to discuss those applications in more detail. The Panel proceeds down the list of applications in rank order and assigns a funding amount to each application until its monetary resources are exhausted.

The Director or Assistant Director for the relevant Program attends the meetings to ensure that the Panel proceeds on the basis of the published criteria, that conflicts of interest do not arise, and that the deliberations take place in an atmosphere of fairness. The Program Directors can deal with cases of apparent bias subtly during the meetings, or they can raise their concerns privately with the NEA Chairman after the meeting. Program Directors attempt to avoid becoming involved in substantive discussions, because they want to avoid the perception that government employees are interfering with the peer review process. According to one Assistant Program Director, "[i]t is vital that we are perceived to be dealing with the field in an objective fashion and that all recommendations be made by the panels."<sup>147</sup>

After the Panel meetings, the Program Director and staff meet with the Deputy Chairman for Programs to review any panel recommendations that were particularly controversial or raised special policy concerns, any significant trends observed, and any issues that might cut across two or more Programs.<sup>148</sup> The Chairman may ask to review particular files, and he occasionally convenes additional meetings with the staff to discuss particular applications or issues. When the staff or the Chairman believes that a panel has made a mistake, the panel can be called back to Washington for an additional meeting, but this happens infrequently. The Chairman very rarely reverses a panel outright. As a practical matter, the "advisory panels, through their recommendations, have come to be the determining element in the grant making process."<sup>149</sup>

The next step in the process is review by the National Council on the Arts. Prior to the Council's quarterly meetings, the staff prepares a book for each council member containing summaries of the applications that the Panels recommended for approval and other materials regarding the Panel discussions, including a list of rejected applicants. The agency does not make these books available to rejected applicants or to the general public. Council members may review one or more of the full applications if they desire, but they normally rely upon the staff-prepared summaries. The Council usually votes on the recommendations of a panel in a block and only very rarely singles out individual applications for separate votes.<sup>150</sup> After being sued by two newspapers under the Federal Advisory Committee Act, the agency decided in 1990 to open all Council meetings to the public.

Following the Council meeting, the applications go to the Chairman for final action. The Chairman usually accepts the Council

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147. The interviewee requested anonymity.

148. NEA PANEL STUDY REPORT, *supra* note 130, at 23.

149. INDEPENDENT COMMISSION REPORT, *supra* note 126, at 26.

150. *Id.* at 31.

recommendations, which in turn reflect the Panel recommendations. The 1990 Amendments to the agency's statute prevent the Chairman from overruling the Council's recommendation not to fund an application.<sup>151</sup> Although the Council is informed of the Chairman's action on each application, the Chairman is not required to provide an explanation for refusing to accept the Council's recommendation that a proposal be funded. Some Chairmen have been careful to prepare detailed justifications couched in the language of the published criteria. Others have provided little, if any, justification for rejecting Council recommendations. The Program officers then inform all applicants of the agency's decision. Rejection letters are usually form letters containing only general information and the applicant's score, but occasionally they are more personalized.

Disappointed applicants may obtain information about the panel review of their applications by calling or writing the relevant Program, but the agency's regulations and guidelines do not say whether that information includes any minutes of Panel or Advisory Council meetings or any summaries of any individual peer reviews.<sup>152</sup> It clearly does not include a copy of the transcript of the tape recording of the meeting. The NEA's regulations on information availability speak only to procedural issues,<sup>153</sup> and agency practice varies widely. Some Program staffers will discuss the contents of Panel meetings in some detail over the telephone with rejected applicants; others prepare summary statements from staff notes and meeting transcripts; and still others are unwilling to interpret the results. Disappointed applicants may request under the Privacy Act that the General Counsel correct a record, which presumably includes errors on a written evaluation. If the General Counsel agrees with the program office that the request should be denied, the Deputy Chairman must resolve the matter. The General Counsel then informs the applicant of the decision and provides reasons. The applicant may then request an informal hearing before the Chairman or Assistant Chairman.<sup>154</sup>

Reacting to charges that panelists were frequently participating in deliberations on applications from their own institutions, Congress in 1990 amended the agency's statute to prohibit individuals who are employees or agents of an organization with an application pending from serving on a panel considering that application.<sup>155</sup> The Arts Endowment has amended its "Standards of Conduct for Council Members and Arts Endowment Panelists" to reflect this more strict conflict of interest

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151. 20 U.S.C. § 955(f) (1988 & Supp. 1992).

152. 45 C.F.R. § 1115 (1993).

153. *Id.* § 1100.

154. *Id.* § 1115.5.

155. Arts, Humanities and Museums Amendments of 1990, Pub. L. No. 101-512, 104 Stat. 1965 (1990) (codified at 20 U.S.C. §§ 951-968. (1988 & Supp. 1992)). Prior to 1990, the statute prohibited a panelist from submitting an application to his or her panel, but did not speak to organizations with which the panelist was affiliated.

requirement.<sup>156</sup> The Standards contain a general direction to every Council member and panelist "to avoid any action which is, or could be interpreted as, a use of Council membership or panel service to further his or her own interests or those of an organization which he or she is affiliated."<sup>157</sup> Council members may not submit an application on behalf of themselves or sign an application on behalf of an organization with which they are affiliated, and they may not participate in any way in a decision involving an application from an organization that employs them or with which they are affiliated.<sup>158</sup>

The Council member must leave the room during the consideration of such proposals.<sup>159</sup> All communications with the NEA concerning an application or grant must be carried out by personnel who are not council members or panelists. Council members and panelists may receive remuneration for participation in funded activities, but only if the Council and the Endowment staff know the approximate amount of the remuneration prior to acting on the application.<sup>160</sup> The propriety of receiving remuneration depends on "the nature of the organization, the amount of Endowment funding in relation to the total budget of the organization, and other relevant factors."<sup>161</sup> Finally, Council members and panelists may not make use of confidential information acquired as a result of their service "in any manner which would advance their financial interests."<sup>162</sup>

Speaking directly to the touchy issue of animus, the standards provide that when a council member or panelist or an organization with which he or she is associated has an adversarial economic relationship with an applicant, the member or panelist must leave the meeting during the consideration of that application. The standards do not elaborate on the novel concept of "adversarial economic relationship." For example, they do not specify whether being the beneficiary of a competing application constitutes such a relationship. The standards are careful to provide that council members and panelists may advocate general policies for adoption by the Council, even though the policies might have an adverse impact on competitors, so long as the agency would implement the policies across the board.<sup>163</sup>

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156. Memorandum from Amy Sabrin, General Counsel, National Endowment for the Arts, to Members, National Council on the Arts, and Arts Endowment Panelists, re: Standards of Conduct for Council Members and Arts Endowment Panelists (Sept. 18, 1991) [hereinafter NEA Standards of Conduct].

157. *Id.* at 2.

158. *Id.* at 4.

159. *Id.* at 3.

160. *Id.* at 4.

161. *Id.*

162. *Id.* at 5. However, this prohibition is not intended to prevent Council members and panelists from supporting artistic endeavors with which they become acquainted during their service. *Id.*

163. *Id.*

NEA has a formal appeals process whereby a program specialist or other agency staffer, but not a rejected applicant, can obtain reconsideration of a rejected application.<sup>164</sup> Beyond this strictly internal review, a rejected applicant may request reconsideration solely on the following procedural grounds: (1) the panel relied on criteria outside of those listed in the published guidelines; (2) the decision was "based on influence on advisory panel [sic] of member(s) with undisclosed conflict of interest"; or (3) the decision was "based on information provided to the advisory panel by staff or panelists that was materially inaccurate or incomplete at the time of review despite the fact that the applicant had provided the Endowment staff with accurate and complete information as part of the regular application process."<sup>165</sup> However, an applicant may invoke this process only if a program specialist or other authorizing official has sought and received an explanation from the Program Director.<sup>166</sup> From the tapes of Panel meetings, the staff can glean whether the Panel relied exclusively upon the published criteria. After consulting with the Chairman, the appropriate Deputy Chairman must then reconsider the action and within forty-five days provide a written summary of the results of his or her reconsideration. The Deputy may request that surveys or site visits be conducted with respect to applicant organizations requesting reconsideration.<sup>167</sup> While reconsideration is possible, the opportunity for it is effectively lost if the applicant does not have a sympathetic "sponsor" within the agency willing to "go to bat" for the project. However, the agency makes it clear that a new application is welcome in the next funding cycle.<sup>168</sup>

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164. Reconsideration of Declined Applications, National Foundation on the Arts and the Humanities, 48 Fed. Reg. 13118 (1983) [hereinafter Reconsideration Regulations]. Within 30 days following a decision not to fund, a Program specialist or other "authorizing official" in one of the programs may request an explanation for the decision not to fund from the relevant Program Director. The Program Director must then provide the requestor with an explanation together with "the substance of the advisory panel review comments." The requestor must be given an opportunity to "present his or her point of view." *Id.* The regulations do not explicitly provide for appeals from denials of grants. Enrique R. Carrasco, *The National Endowment for the Arts: A Search for an Equitable Grant Making Process*, 74 GEO. L.J. 1521, 1545 (1986).

165. Reconsideration Regulations, *supra* note 164.

166. *Id.*

167. *Id.*

168. Apparently, there is an additional informal appeals procedure for decisions by the Chairman not to fund a project that has received the endorsement of both the relevant peer review panel and the National Council on the Arts. In the first case in which the Chairman took this action, vetoing a proposal to use plants that absorb toxic metals to clean a hazardous waste site, Chairman Frohnmayer agreed to meet with the rejected artist to discuss the reasons for his action. After the meeting, Frohnmayer reversed his decision, explaining that he had been persuaded that the project, which initially seemed more appropriate for EPA funding, had artistic value. William Honan, *U.S. Arts Chief Overturms an Approval*, N.Y. TIMES, Nov. 27, 1990, at B3; Kim Masters, *NEA Grant Reversal Scene: Chairman Set to Approve Project He Rejected*, WASH. POST, Dec. 21, 1990, at D2.

### III. THE POTENTIAL FOR BIAS IN PEER REVIEW

Although the funding decisions of the scientific and artistic granting agencies in the United States are theoretically bound by objective criteria, there is still room for bias in the process. The extent to which bias actually affects individual outcomes is a difficult empirical question that has been examined periodically, but has never been resolved. While this article does not purport to answer this question definitively, it will draw upon the existing literature and the experiences of the four agencies described above to explore the *potential* for bias in the peer review process and to suggest ways in which bias in the system can yield socially undesirable outcomes.

Nearly all of the researchers and grants administrators interviewed in connection with this article agreed that bias was not a pervasive problem in the NIH, NSF, and EPA.<sup>169</sup> Moreover, there is a lack of direct empirical evidence of actual bias in these agencies. This is not surprising because bias is not especially susceptible to empirical validation. However, the potential for bias bears careful examination, because the public perception that a grants process in which public funds are at stake is biased can erode public support for the program and ultimately result in its decline or demise. Moreover, the intense competition in recent years among exceedingly qualified researchers for a shrinking pool of resources may increasingly threaten the integrity of the peer review process in the scientific granting agencies. When the stakes are so high, the temptation to cut corners and apply inappropriate criteria may be higher and the need to shield the process from bias correspondingly greater.<sup>170</sup>

The evidence of bias in NEA is stronger. The NEA historically allowed panelists to sit on panels that reviewed applications from their own institutions and from their friends and close associates, and some

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169. After an intensive investigation into the peer review process at NSF in 1976, a House investigatory subcommittee concluded:

No method superior to peer review has been found for judging the scientific competence of proposers. Scientific peers are better able than others to judge the design of proposed work, the importance of proposed work to the scientific field, and the past performance of the proposer. Appropriate peer review procedures generally lead to the support of proposals in a high quality range. Using peer review procedures the Foundation has successfully fostered significant advances in basic science over the past 25 years.

HOUSE COMMITTEE REPORT ON NSF PEER REVIEW, *supra* note 4. A more recent "Merit Review Task Force" assembled by NSF concluded: "The system is remarkably fair and is an effective mechanism for identifying and funding high-quality proposals in every discipline the Foundation supports. Many consider it to be the best system in the world." MERIT REVIEW REPORT, *supra* note 59, at 1.

170. See Leon E. Rosenberg, *Medical Research Is In Ruins*, N.Y. TIMES, Sept. 2, 1990, at 13 (the chronic shortage of funding at NIH "results in such a small fraction of meritorious grants being awarded that it jeopardizes the very objectivity and integrity of the peer review system for evaluating research—a system that depends on a vigorous and varied research community").

outside critics discerned a strong pattern of "old boyism" in the outcome of the granting process.<sup>171</sup> Yet most complaints of bias in the peer review system at NEA have come from outside critics who are dissatisfied with the results and may have their own axes to grind. While the following discussion necessarily tends to focus on criticisms of peer review programs, support for the peer review system as a whole is both broad and deep among those who deal with it on a regular basis.

### A. Animus and the Plight of "Mavericks"

In a grants program able to fund only a small number of meritorious applications, a single bad review can prove fatal to a grant proposal.<sup>172</sup> The victim of personal animus on the part of a peer reviewer can legitimately complain that the process is unfair. In a broader sense, animus runs counter to the public interest in awarding grants to the most deserving applicants through an objective application of the statutory or regulatory criteria. A single, isolated case of animus is probably not that damaging to programs in which many qualified applicants contend for a limited supply of discretionary funds. But if the bias is manifested against whole groups of people or if a significant number of those in the applicant pool perceive that the system could be unfairly abused to discriminate irrationally, potential applicants may be discouraged from applying for grants in the future. More subtly, in order to avoid a single negative assessment, proposal writers may begin to submit bland proposals for inoffensive studies that do not advance scientific knowledge or artistic creativity to any significant degree.<sup>173</sup> Similarly, public support for a system that consistently blackballs qualified applicants for reasons unrelated to the statutory or regulatory criteria will probably erode over time.

Fortunately, there is little evidence of personal animus in the agencies studied here.<sup>174</sup> For example, the fact that rankings in NIH are

171. See, e.g., George Archibald, *NEA Review Panelists Run Grant Giving "Buddy System,"* WASH. TIMES, Aug. 3, 1990, at A1.

172. As one successful NSF applicant observed, "[a]ll one needs is one unsubstantiated or emotional comment by one reviewer to significantly lower one's chances." CHUBIN & HACKETT, *supra* note 4, at 78. Another close observer of the peer review process noted that "in the present climate of opinion, a colleague who knows that he or she has the certain power to doom [a] proposal by a check mark in the "Fair" or "Good" category—even if accompanied, albeit inconsistently, by written praise—might well be inclined to use it." Rustum Roy, *Alternatives to Review by Peers: A Contribution to the Theory of Scientific Choice*, 22 MINERVA 316, 319 (1984). Many other applicants and reviewers interviewed for this article expressed similar views.

173. CHUBIN & HACKETT, *supra* note 4, at 75 ("The lesson is clear . . . a writer must please all of the reviewers all of the time, and be especially careful never to offend any of them.").

174. Congressional hearings into the peer review process at NSF conducted in the summer of 1976 produced some limited testimony of the existence of "bias against someone a reviewer knew and disliked or disagreed with." HOUSE COMMITTEE REPORT ON NSF PEER REVIEW, *supra* note 4, at 33. NEA has received some complaints that the NEA

made in meetings in which as many as twenty-five scientists are present helps shield against animus on the part of any single committee member. Each participant knows that other panel members are also experts and will probably detect attempts to grind any axes. Similarly, the multi-tier review process in place at the Science and Technology Research Centers Program in NSF is effective in shielding proposals from animus once the proposals have made the 30-application cutoff. While it is less likely that personal animus in NSF mail reviews would come to the attention of the agency, few rejected applicants have blamed their fate on personal animus. The far more frequent complaint is that the reviewer lacks sufficient expertise to evaluate the application appropriately.

However, an animus of a less personal sort seems to pervade peer review in the scientific agencies. The most frequently identified bias among the scientists interviewed for this article was the subtle bias that the scientific peer review bodies exert against "mavericks" who reject conventional assumptions and approaches.<sup>175</sup> Several researchers and grant administrators interviewed in connection with this article observed that projects well within the "mainstream" of previously funded research have a much better chance of being funded than research that rejects conventional wisdom.<sup>176</sup> The result can be a big fraternity of scientists all reaching the same conclusions and not testing each others' hypotheses.

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Chairman or the Advisory Council on the Arts has rejected applications because of a dislike for the applicant or some aspect of the applicant's lifestyle, but these accusations are virtually never directed at the peer review panels.

175. In a 1986 survey conducted by NSF of nearly 10,000 academic scientists, almost two-thirds agreed with the statement that "NSF is not likely to fund high-risk exploratory research because the likelihood of obtaining favorable reviews is slim." NATIONAL SCIENCE FOUNDATION, FINAL REPORT: NSF ADVISORY COMMITTEE ON MERIT REVIEW (1986); see also Bjerklie, *supra* note 63. In a survey of successful and unsuccessful applicants at the National Cancer Institute, 60.8% agreed with the proposition that reviewers were reluctant to support unorthodox or high-risk research, while 17.7% disagreed and 21.4% were neutral. CHUBIN & HACKETT, *supra* note 4, at 66, tbl. 3. A former Vice President for Research at the Massachusetts Institute of Technology testified in 1979 that the peer review process discriminates against new interdisciplinary science and scientific thinking that is not "au courant" even though creative and ripe with "unusual possibilities for breakthroughs." Luther J. Carter, *A New and Searching Look at NSF*, 204 SCIENCE 1064, 1064 (1979) (quoting testimony of Dr. Thomas F. Jones, Vice President for Research at MIT); see also HOUSE COMMITTEE REPORT ON NSF PEER REVIEW *supra* note 4, at 27 ("If a proposal challenges the mainstream of scientific thought, the expert peer reviewer who is in the mainstream will tend to see the proposal as wrong on the face of it."). See generally David F. Hossobin, *The Philosophical Basis of Peer Review and the Suppression of Innovation*, 263 J. AM. MED. ASS'N. 1438 (1990).

176. NEA, on the other hand, does not appear to have a problem with refusals to fund mavericks. Highly original projects are routinely funded, and creativity is perceived as a great virtue in the panels. The agency suffers considerably more criticism from the avant garde nature of some of its funding decisions. Indeed, some panel actions, such as the recommendation to fund a former prostitute named "Scarlet O" who decided that she would rather be known as a performance artist, call into serious question the very professionalism upon which the peer review process critically depends. Todd Allan Yasui, *Defending NEA's Vetos*, WASH. POST, Feb. 10, 1992, at B7 (in a videotape of one of her performances, Ms. O discussed gender, stripped, and invited members of the audience to

Thomas Kuhn has observed that scientific revolutions occur when a few scientists begin to reject the dominant "paradigm."<sup>177</sup> The conventional paradigm is accepted in the literature and in the classroom, and it produces the background assumptions that facilitate scientific dialogue. As bits and pieces of data are reported that the dominant paradigm cannot explain, however, a few practitioners begin to reexamine the background assumptions and some reject the paradigm, at least in some contexts. Adherents to the old world view invariably resist challenges to the conventional paradigm, but sooner or later mounting evidence may produce a scientific revolution in which a new paradigm replaces the previously dominant paradigm.<sup>178</sup> An important battleground in the war between the paradigms is the discretionary grants process. People who have spent their careers conducting research aimed at bolstering and extending the dominant paradigm are reluctant to direct resources toward research aimed at destroying it.

One NIH investigator observed that advocates of new or different approaches face a "Catch 22" in the peer review process, because the reviewers often criticize proposals on the ground that the research lacks a sufficient predicate in previously published research. An NIH researcher complained that although his group had published many papers in peer reviewed journals, it had difficulty getting NIH grants "because the panels are representative of the opposite school of [thought], and it's very threatening for a scientist to see a new idea. It's automatically shot down."<sup>179</sup> Several scientists and agency staffers noted that a decision to fund a maverick proposal is to some extent an acknowledgment that the dominant paradigm may be wrong, and this weakens the case for continued funding of existing grants. The difficulty, of course, lies in distinguishing the innovative but promising proposal from the quirky idea that has no chance for success. According to the Director of EPA's Research Grants Staff:

It is our impression that many of the proposals received (particularly in the SBIR program) are not the productions of inventive genius not recognized in its time, but inoperable schemes, reinventions of old ideas, and theories which violate basic principles of physics, chemistry, etc. The authors of these proposals may well be viewed as mavericks fighting against the weight of conventional scientific opinion, but they are precisely the reason why we use technical and scientific peer panels to review proposals and recommend for or against support by EPA.<sup>180</sup>

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rub lotion on her body); *see also* Walter Berns, *Saving the NEA*, NAT'L REV., Nov. 19, 1990, at 34 (complaining that "the arts community insists that everything produced by someone claiming to be an artist is in fact a work of art").

177. KUHN, *supra* note 12.

178. *Id.*

179. The interviewee requested anonymity. *See* note 4, *supra*.

180. Papetti Interview, *supra* note 112.

NSF's unique program for awarding small seed grants to novel proposals outside of the formal peer review channels is an attractive vehicle for avoiding the tendency of peer review to ignore mavericks. A Program Director may set aside up to five percent of the Program's funds for these expedited awards of up to \$50,000. Because it vests complete discretion in the Program Director, it can be used to fund pet projects of little scientific value, but the \$50,000 cap ensures that not too much money is devoted to any single project before it must prove itself in the formal peer review process. Although not a complete solution to the maverick problem, the NSF program is a step in the right direction, and other agencies should consider implementing similar programs.

## B. Tunnel Vision

Just as peer review panels tend to be biased against mavericks, they often exhibit "tunnel vision" with respect to whole categories of proposals that appear to lack relevance to professionals trained in a particular discipline or subdiscipline. For example, when considering a proposal for a novel technique for detecting the presence of certain toxic chemicals in the environment cheaply and accurately, a National Cancer Institute (NCI) study section concluded that the project would not sufficiently advance scientific knowledge to warrant a high priority. According to an NCI staffer, the panelists failed to see the potentially large impact on human health that a cheap and effective exposure-avoidance device could have, despite the fact that it would not provide much additional information about the chemical itself.<sup>181</sup> This "tunnel vision" problem is partially a function of the composition of the peer review committees and partially a problem of ambiguity as to any particular panel's proper substantive bailiwick. The agency staff can best address this by articulating clear policies with respect to the scope of fundable research and resisting peer reviewer attempts to narrow that scope. However, tunnel vision is also partially a function of the composition of the peer review committees, a topic that will be addressed below.

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181. The story has a happy ending. The staffer in charge of the project referred the applicant to the National Institute for Occupational Safety and Health, and the study was later funded.

According to one researcher who applied to both NSF and EPA for grants:

The success of a proposal often depends on the reviewers' perceptions of what constitutes technical merit. In 1982, my proposal received a very high rating from the EPA review panel. The very same proposal was not funded at NSF, despite generally good reviews. One reviewer in the biological program didn't like it, possibly because it had an engineering perspective. This negative vote was the kiss of death.

AMS REPORT, *supra* note 102, at E-2 (quoting Joseph DePinto, Clarkson University).

## C. Favoritism

Favoritism adversely affects the public interest in several ways. First, if favoritism plays a significant role in overall proposal ranking, the awards will not necessarily be given to the most deserving applicants, thereby undermining the substantive policies underlying the grant program. Second, if a grant program is perceived as playing favorites, future applicants may be discouraged from applying. Third, as the perception of favoritism spreads from the participants in the process to the public at large, public support for the program will dwindle. All of the agencies studied in connection with this article are aware of the threat favoritism poses to the integrity of the grants process, and all have taken steps to combat it.

### 1. CO-WORKERS AND FORMER STUDENTS

When a panelist sits in judgment upon a proposal of a present or former co-worker, a former student, or other close associate, there is potential for favoritism. For example, soon after EPA initiated its peer review system in 1980, a newly appointed Assistant Administrator for Research and Development, Andrew Jovanovich, was accused of steering grants to one of his former business associates outside of the peer review process. According to a report by the agency's Inspector General, a Massachusetts Institute of Technology researcher, Ronald Probst, met personally with Assistant Administrator Jovanovich after a peer review panel rejected his proposal to study water treatment technology. Jovanovich had previously supervised Probst's work at a private research institute. After Probst angrily denounced the Panel's decision and complained that he would have to lay off several graduate students, Jovanovich interceded with the lower level staff and demanded that Probst's proposal be reviewed by another panel containing only two members, one of whom would be selected by Jovanovich and the other by Probst. Not surprisingly, the new panel was effusive in its praise of the proposal, and the agency awarded a \$77,000 grant. Jovanovich explained that lower level EPA grant officials were "very poor at selecting the right work," but the Inspector General found that "allowing a scientist to select his own peer reviewer, especially one he has previously worked with, lacks any appearance of independence or objectivity . . . and would leave EPA open to charges of cronyism."<sup>182</sup>

NIH attempts to avoid even the appearance of favoritism by excluding from study sections applicants, their families, and their

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182. Howie Kurtz, *EPA Research Chief Violated Contract Award Rules, Probe Finds*, WASH. POST, Apr. 10, 1982, at A3. Later, Jovanovich's appointment as Assistant Administrator for Research and Development was withdrawn, and he was reassigned to a low-level agency post. In the intervening years since the Jovanovich incident, there have been no further charges of impropriety at high levels in the Office of Research and Development, and the extensive peer review process for awarding grants in OER has apparently proceeded without substantial interruptions from high-level officials.

co-workers both at their institutions and at other institutions. In addition, although NIH's conflict of interest regulations allow a person to sit on a panel that considers applications from the panelist's institution, the panelist must leave the meeting when the panel is considering an application from his or her own organization or an organization with which he or she is negotiating for future employment. Congress in 1990 amended the agency's statute to prohibit individuals who are employees or agents of an organization with a pending application from serving on a panel considering that application.<sup>183</sup> Since EPA panelists tend to be well-established university research scientists with substantial teaching careers, the agency has identified a potential for favoritism when the panel discussion focuses on proposals of one of the panelist's former students. The agency has adopted a rough rule of thumb that a panelist need not recuse himself from the consideration of proposals from former undergraduate students or from former graduate students who have not graduated within the last five years.

## 2. OLD BOYISM AND THE HALO EFFECT

One of the most common complaints raised about peer review is that it fosters an "old boy network" that subtly dominates the agency's evaluation process. The closely related "halo effect" exists where peer reviewers fund poorly conceived projects by well-known scientists or scientists from highly regarded institutions purely because of their past reputations, and not on the merits of their proposals. Although complaints about "old boy" networks and the halo effect are frequently voiced,<sup>184</sup> the empirical basis for such claims is relatively weak.<sup>185</sup>

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183. Arts, Humanities and Museums Amendments of 1990, Pub. L. No. 101-512, 104 Stat. 1965 (1990) (codified at 20 U.S.C. §§ 951-968. (1988 & Supp. 1992)).

184. A summary of the testimony presented at extensive 1976 congressional hearings on the grants process at NSF concluded: "The most common objection to the use of peer review is that it is subject to 'backrubbing' or 'old boys clubs,' in which mutual friends unduly praise each other's proposals." HOUSE COMMITTEE REPORT ON NSF PEER REVIEW, *supra* note 4, at 22. In a 1986 survey of about four thousand scientists conducted by a national science fraternity, 63% agreed with the statement: "Procurement procedure for grants to do governmentally sponsored research depends on 'who you know.' Many requests seem to be funded primarily because the researchers are already known to and supported by the granting organizations." SIGMA XI, THE SCIENTIFIC RESEARCH SOCIETY, A NEW AGENDA FOR SCIENCE (preliminary report) (1986), reprinted in GENERAL ACCOUNTING OFFICE, UNIVERSITY FUNDING: INFORMATION ON THE ROLE OF PEER REVIEW AT NSF AND NIH 7 (1987). In a survey of successful and unsuccessful applicants for National Cancer Institute grants, 39.5% of the respondents agreed with the proposition that "old boys networks" controlled the study sections, while only 32.7% disagreed and 27.8% were neutral. CHUBIN & HACKETT, *supra* note 4, at 66, tbl. 3. The most strident critics of the peer review system characterize it as "an incestuous 'buddy system' that frequently stifles new ideas and scientific breakthroughs, while carving up the multimillion dollar Federal research and education pie in a monopoly game of grantsmanship." HOUSE COMMITTEE REPORT ON NSF PEER REVIEW, *supra* note 4 (testimony of Rep. John Conlan).

185. A 1988 NSF study of 9500 principal investigators found some evidence of a perception of an old boy network among NSF grantees. Consistently successful

Throughout much of the NEA's history, outsiders have criticized the NEA panel system for being an "old boy" network in which insiders impose their own arbitrary constraints on the art and artists who get funded.<sup>186</sup> One NEA staffer interviewed for this article agreed that the agency had sometimes become a "captive" of its peer review panels.<sup>187</sup> If the panels want to "look out for their own," there is little that the staff (or even the Chairman) can do about it. However, the high turnover rate of

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applicants were "more likely than the average applicant to be male, older . . . and much more likely to be associated with a [prestigious research] institution," and 97% of them had served as reviewers or panelists, an indication of high status in the relevant research community. NATIONAL SCIENCE FOUNDATION, PROPOSAL REVIEW AT NSF: PERCEPTIONS OF PRINCIPAL INVESTIGATORS 10 (1988) [hereinafter NSF PERCEPTIONS REPORT]; see also Jim McCullough, *First Comprehensive Survey of NSF Applicants Focuses on Their Concerns About Proposal Review*, 14 SCI., TECH., & HUMAN VALUES 78, 81 (1989). At the same time, consistently successful awardees "were more likely to have known the program officer and to have made some personal contact before submitting a proposal." *Id.* at 81; see also NSF PERCEPTIONS REPORT, *supra*, at 12. When the respondents who indicated dissatisfaction with the process (38% of all respondents) were asked to give reasons, they were somewhat more inclined to attribute any failure in the process to incompetent reviewers (18%) than to any cronyism, politics or an old boy's network (12%). NSF PERCEPTIONS REPORT, *supra*, at 14-16; McCullough, *supra*, at 82. In an independent survey of 719 applicants for NIH grants in fiscal years 1980-1981, 17.9% strongly agreed and 23.5% agreed with the proposition that "old boy networks control the RIGs or study sections," while only 23.1% disagreed and 9.7% strongly disagreed. G. Gillespie, Jr. et al., *Researchers' Cynicism and Desire For Change*, 10 SCI., TECH. & HUMAN VALUES 44, 45 (1985).

A five-year study of NSF grants conducted during the late 1970s found no evidence that reviewers at "major" research institutions treated proposals from applicants at major institutions more favorably than did reviewers from lesser institutions. In fact, there was "a tendency in the opposite direction." Cole et al., *supra* note 72. The same study found only "low or moderate" correlations between actual funding at NSF and other indicators of the halo effect including academic rank, locus of Ph.D training, and previous NSF funding history.

186. See RICHARD NETZER, *THE SUBSIDIZED MUSE* (1978) (Consciously or not, some peer review panels amount to 'old boy' networks that respond favorably to applicants who are part of that network.); *Can the Government Promote Creativity—Or Only Artists?*, N.Y. TIMES, Apr. 25, 1982, at 6 ("[D]ecisions . . . about what's good and worthy of support are made centrally by people who sit on peer review panels who do represent one segment of the society. They are almost 99% previous or current grantees.") (Quoting Ms. Arlene Goldbard, Co-director of the Baltimore-based Neighborhood Arts Programs National Organizing Committee.); Lanquette, *supra* note 120 ("[T]he charge most often heard today is that these panels, rather than acting as government arbiters can work instead as 'old-boy' networks—passing out plums to friends and colleagues."); McLellan, *supra* note 8 ("There are cliques and friendships in the Arts and questions of artistic merit often overlap with questions of personal taste."); *National Endowments for the Arts is Honored as 20th Birthday Nears*, N.Y. TIMES, Sept. 1, 1985, at 68 ("The endowment has an insider-outsider working system. In a time of no expansion in the arts, younger artists are coming up against a middle-aged generation of arts administrators who make up the grant-giving panels.") (quoting Mr. Derek Guthrie, publisher of *The New Art Examiner*); Allan Paracini, *National Endowment: Arts Agency: Living Up To Its Billing?*, L.A. TIMES, Sept. 9, 1989, at 1 (citing Kevin Mulcahy, Professor of Political Science at Louisiana State University, for the proposition that the peer review system at NEA "has often tended to operate as a network serving the interests of well-connected artists that is hard for other artists to penetrate.").

187. The interviewee requested anonymity. See note 4, *supra*.

the panels now required by the 1990 amendments helps reduce the probability that a coterie of "old boys" will effectively control the panel's decisions for an extended period of time. Each panelist is chosen for only a one-year term and may not be appointed for more than three consecutive terms. Some panels have a 100 percent turnover rate. As one NEA staffer put it: "No matter who you are, you are going to run out of your friends sooner or later." Another shield against "old boyism" is the agency's conscious attempt to select panels that reflect geographic and cultural diversity.

An example of "old boyism" occurred recently in NIH. When one frequently funded researcher decided to shift his research interests to a slightly different area, he was told by friends high up in NIH that the field in which he proposed to conduct research was a "club" and that he was not a member of the club. They subtly suggested that he would enhance his chances of receiving a grant in the new field by hiring a member of the club as a consultant on his project. Another technique used by up and coming researchers is to offer to make a member of the "club" a co-author of a paper as an introduction into the old boy network. Still another technique for new researchers is to circulate drafts of the grant proposal to prominent scientists in the field who are likely to be members of the study sections for comments prior to submitting the proposal to NIH. The recipients will feel flattered that their advice was requested, and they will obtain a familiarity with the subject matter of the proposed research apart from their status as members of the panel.<sup>188</sup>

The old boy network can also work on an institutional level. One NSF Program Officer candidly observed:

This is a closed community of people and they all know each other. It is real peer review and can be incestuous, making it hard for a new university to break into a field unless the peer reviewer will let them in. It is really a closed club where only certain schools can get funded for the most part.<sup>189</sup>

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188. NIH staffers questioned this strategy, because the agency's informal rules of practice require a reviewer to excuse himself if he has been asked to review a proposal outside of the formal NIH process.

While recognizing the fact that it is often hard for a young or inexperienced researcher to break into the system by securing an initial grant, one NIH staffer attributed this difficulty to the novice's general lack of familiarity with the procedures and with the evaluative criteria, rather than to any favoritism for members of the "club." The staffer also noted that NIH committees already contain a fairly large number of Assistant Professors with little prior experience with the NIH grants process, thus reducing the chance that a given committee will be dominated by an "old boy" faction. Finally, NIH staffers observe that many established scientists do not get funded while many newcomers do.

189. Some educated outsiders insist that the National Institutes for the Arts and Humanities are biased in favor of East Coast cities and schools. See, e.g., Paracini, *supra* note 186 (citing several prominent supporters of NEA who nevertheless believed that the Northeast has dominated in the competitions and for the proposition that NEA has not achieved broad ethnic representation). One especially strong adherent to this view was nominated, but not confirmed to be the Chairman of the National Endowment for the

A study sponsored by the Los Angeles Times under the direction of California Institute of Technology political science Professor Bruce Cain determined that prior to 1982, twenty academic research institutions received forty-one percent of all federal research money allocated to universities. The remaining fifty-nine percent was distributed among the remaining 570 institutions.<sup>190</sup>

The halo effect may have a smaller impact than old boyism. Although the halo effect may have distorted the process in the past, it is not clear how large a role it plays in the current age of extremely tight budgets. One interviewee explained that reviewers are increasingly unwilling to keep an old timer afloat with funds that could be spent on more relevant or productive projects. Another observed that when agency staffers review a poor proposal from an established scientist, they can subtly suggest that the applicant withdraw the proposal and improve it. A panel can also limit the duration of the grant as a "slap on the wrist" of the established scientist who submits a bad proposal.

The extent to which the halo effect alters rankings in NSF depends upon the program. Some programs routinely fund proposals from highly regarded researchers, even though the proposals are of uneven quality. Other programs take pride in their refusal to look beyond the last funded grant in evaluating an individual's application. One Program Officer reported that when "famous people jot down notes and throw them at us, we'll turn them down and love doing it." As a consequence, research careers in programs that do not give much credit for past performance tend to end relatively quickly. Forty-five year-old researchers close down their laboratories after twenty years, because they cannot compete with twenty-five year-old "hot shots" who put in twenty hour days. The cycle repeats itself as the younger researchers acquire additional responsibilities and begin to burn out.

EPA staffers appear to be ambivalent about the "halo effect." One Science Review Administrator (SRA) did not believe that the halo effect seriously affected the process at EPA, noting that "[w]e've shot down many big names." Another SRA noted that many successfully funded applicants are funded very frequently, and suggested that "[t]here are some applicants with more clout than others." He further opined that "a former [Panel] chairman may pull some weight." Yet, the fact that during the years 1986-90 a total of 281 awards were made to a total of 135 institutions, no one of which received more than 4.5 percent of the total funds awarded suggests that the money is spread around fairly evenly.<sup>191</sup>

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Humanities. He vowed that if confirmed, he would ensure that "[n]ot everything would go to Harvard, Yale, Princeton, and Chicago" and that "more grants [would go] to Texas and Oklahoma." Carla Hall, *Bradford Speaks Out: NEA Chair Candidate on His Program Plans; Bradford on the NEA*, WASH. POST, Oct. 28, 1981, at B1.

190. Frank Clifford, *Worrisome Trend; Research Funds: Not So Scientific*, L.A. TIMES, Nov. 27, 1987, at 1.

191. This staffer requested anonymity.

The "halo effect" seems even less pronounced at NEA. In part, this is attributable to the large number of applicants and the lack of a tradition of continuously funding any single individual applicant's grants. It may also stem from the fact that well-known artists are often highly paid in the private market and therefore do not stake claims to NEA funds. Although panels are not supposed to consider the applicant's financial need in evaluating the quality of proposals, there is an unwritten rule that artists who do not really need the money should not ask for NEA's limited fellowship funds. However, the halo effect may play a larger role in programs involved in funding large organizations, such as orchestras and museums.

A granting system run by a coterie of old boys discourages innovative proposals from bright applicants who have not found their way into the network. In the extreme, science and art are reduced to schmoozing. While old boy networks do not give all applicants a fair opportunity to secure funding, it is less clear that the halo effect is unfair. To the extent that the researcher earns the halo by dint of excellent work over many years, the panel is merely giving the established researcher the benefit of the doubt. Critics of the peer review system who would disperse limited governmental funds in large multi-year grants to the researchers with the very best reputations in the relevant fields would, in fact, elevate the halo effect to a matter of principle.<sup>192</sup> Others argue that while an applicant's reputation should play a role in the process, the dominant considerations should still be the quality of the most recent research output and the content of the current proposal.<sup>193</sup> To do otherwise is to give hallowed elders an unfair advantage. In sum, whether agencies should take steps to reduce or eliminate the halo effect is a debatable point.

### 3. STACKING THE DECK

The agency staff can play favorites by "stacking the deck" with peer reviewers who will predictably fund the staff's favorites.<sup>194</sup> For example,

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192. See Roy, *supra* note 11.

193. This was the position taken by most of the agency staffers questioned on this issue.

194. Several witnesses at the 1976 House subcommittee hearings on peer review at NSF agreed that agency staffers could achieve rough ranking outcomes by choosing particular reviewers with known predispositions, but there was little agreement on the extent to which this was in fact happening at NSF. HOUSE COMMITTEE REPORT ON NSF PEER REVIEW, *supra* note 4, at 31. According to one critic of peer review, "[t]he system is susceptible to manipulation by managers who operate under the emotional cover of the 'peer review' rubric so that individual . . . proposals may be favored or disfavored simply by appropriate selection of the reviewers." Roy, *supra* note 11, at 75.

In agencies like EPA in which the chairman of the peer review committee chooses the panel members, the staff do not have an opportunity to stack the deck. The person that chooses the panel members, however, may still stack the deck with persons who are likely to fund his or her favorites. This may be more disturbing from a public policy perspective, because the entity exercising the most discretion is not an accountable

NSF Program Officers, who select the mail reviewers and are generally familiar with their outlooks and biases, can subtly "stack the deck" in a way that increases the likelihood of favorable reviews for a particular researcher or kind of research. Similarly, critics maintain that NEA staff can stack the deck with peer reviewers who will predictably fund avant garde projects.<sup>195</sup> The extent to which staff discretion in choosing panelists is a good or a bad thing is, like the halo effect, a matter about which reasonable minds can differ. Most would agree that a stacked panel will not necessarily make objective funding decisions and will give rise to legitimate fairness concerns. The staff has an obligation to provide fairly balanced panels, and this may rise to the level of a legal duty under the Federal Advisory Committee Act.<sup>196</sup> But one person's attempt to achieve balance may be another person's plot to stack the deck. It is, in other words, very difficult to know whether particular appointments are aimed at ensuring funding for favorites or at remedying imbalance in a committee already wedded to a particular point of view.

## D. Conflict of Interest

### 1. FINANCIAL CONFLICT OF INTEREST

Like animus and favoritism, financial conflict of interest can discourage qualified applicants from entering what appears to be a "rigged" system. In addition, a public perception that researchers are feathering their own nests with federal research dollars would seriously undermine public support of government-funded research. Finally, it is simply immoral and perhaps illegal for an individual to appropriate another's ideas through the peer review process for private gain. Theft is theft, whether it takes place in the streets or in a committee room.

The scientific and arts communities apparently recognize the judicial principle that no person should be the judge of his or her own case, and regulations in all of the agencies studied in this article preclude applicants from participating in the consideration of their own proposals.<sup>197</sup> Yet, not all agencies prevent a person from sitting on the

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government employee. Indeed, at the extreme, such delegation of governmental power to private institutions may raise constitutional concerns under the delegation doctrine. See *Carter v. Carter Coal Co.*, 298 U.S. 238 (1936).

195. Frequent NEA critic, Richard Grenier claims that " 'peer review panels' . . . are stacked, a joke." Richard Grenier, *A Vote to Bring Back Guillotine at NEA*, WASH. TIMES, Apr. 4, 1991, at G61. Grenier offers no empirical support for this proposition, but it seems to be widely held by culturally conservative critics of NEA.

196. See *infra* text accompanying notes 248-302, for a discussion of applicability of Federal Advisory Committee Act to peer review panels.

197. 45 C.F.R. § 684.11(g) (1993); NIH MANUAL 4510, *supra* note 24, at 7; NATIONAL SCIENCE FOUNDATION, PROPOSAL AND AWARD MANUAL I-5 (1989). The flat prohibition on participating on a panel that reviews an applicant's proposal raises the question of what to do with a panelist's application. The Division of Research Grants in NIH attempts to send panelists' applications to closely related committees, but they receive no special treatment

panel that considers his or her application, so long as the applicant leaves the room while the panel considers his or her proposal.<sup>198</sup> In the late 1980s, NEA received a great deal of criticism for this practice,<sup>199</sup> and it has since revised its conflict of interest regulations to prevent any person who is an applicant or a representative of an organizational applicant from serving on a panel that considers that application.<sup>200</sup> EPA, on the other hand, continues to allow applicants to be panelists so long as they recuse themselves during the consideration of their own proposals.

Although limited recusal shields the decisionmaking process from overt participation by the panelist-applicant, the remaining panelists know when they evaluate a fellow panelist's proposal that they will have to work with that panelist in the future. This may inspire them to view the proposal favorably.<sup>201</sup> Even though the scores are supposed to be confidential, a panel member whose proposal is rejected knows that one or more of the other panelists panned it. Conversely, to the extent that other panelists are also potential applicants, they may view the proposal favorably in the hope that the panelist-applicant will reciprocate.<sup>202</sup>

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there, and they occasionally suffer from the second committee's lack of technical expertise in the relevant area. Panelists are apparently willing to accept this reduction in the chances that their proposals will be funded during the time that they serve on the panels because of the additional insight into the working of the grant process and the prestige that panel membership entails. Program Directors monitor the results of the peer review process to see if panelists have received unfair evaluations, and they occasionally make a case to the relevant Advisory Council and upper level Institute staff for funding such proposals by exception.

198. See NEA Standards of Conduct, *supra* note 156, at 4.

199. See, e.g., Paracini, *supra* note 186; Joyce Price, *NEA Grant Procedures Need Fixing, Says Panel*, WASH. TIMES, Sept. 11, 1990, at A5. Similar conflicts have been noted in state arts councils. See Chris Pasles & Herman Wong, *Arts Council Doling Out Funds Today*, L.A. TIMES, Aug. 28, 1987, at 1.

200. 20 U.S.C. § 959(c) (1988 & Supp. 1992).

201. See A. E. Shamoo, *The Role of Conflict of Interest in Public Advisory Councils*, in *ETHICAL ISSUES IN RESEARCH* 162-73 (D. Cheney ed., 1993) (finding empirical evidence to support the thesis that members of NIH Advisory Councils "enjoy advantages during, and after, their service on such review panels").

202. In a response to an earlier draft of this Article, the Director of EPA's Research Grants Staff noted that EPA's panels differ from those of NIH in that they are not standing committees with fixed memberships. Because EPA's panels are assembled ad hoc from an informal list of technically proficient people who have agreed to serve as panelists, subtle quids pro quo are not as easily arranged. In addition, EPA's strict division of disciplines among its panels arguably precludes sending a panelist's proposal to another panel. Unlike NIH, there are no closely related panels with the technical capacity to evaluate the proposal of an applicant who is a member of a different panel. Papetti Interview, *supra* note 112.

One solution to this dilemma is simply to preclude all applicants from sitting on any panels. Since the agency has available to it a list of possible panelists and since a panelist need serve for only a single round of evaluations, it should be easy enough to assemble a panel of persons who do not have an application currently pending before EPA. Moreover, since each panel draws on expertise in a broad range of disciplines, the universe of potential panelists is no doubt fairly large.

Agency practice varies greatly on whether an individual employed by an institution may sit on panels that deliberate on applications from other individuals from the same institution. Only NEA, pursuant to statute, forbids this practice altogether. NIH, NSF and EPA allow a panelist to be a member of the panel that considers an application from his or her own institution, but require that panelist to leave the room during the consideration of that application. The same considerations that apply to direct conflict of interest apply with somewhat attenuated force to this sort of institutional conflict of interest. Given the size of many American universities, however, it may be impractical in the scientific agencies to insist on the complete prophylaxis that Congress has imposed on NEA.

Financial conflicts of interest are of special concern in programs, such as NIH's General Clinical Research Centers and Biomedical Research Technology Program, that are designed to stimulate commercial development. A university scientist who sits on a peer review committee reviewing the application of a for-profit entity for which he or she consults may have a more direct economic conflict of interest than exists when the application is simply from another scientist or the same university. In the case of small for-profit entities the scientist-consultant may have a greater financial stake in whether a fellow employee receives a grant. It may be desirable in such situations to avoid the appearance of impropriety by forbidding any potential reviewer from sitting on a panel that considers an application from any company from which he or she derives income.

A less direct conflict of interest can result when a scientist from a private sector competitor (or a university scientist with financial ties to a competitor) of a for-profit applicant sits on the review committee for a grant proposal from that applicant. The reviewer will no doubt become privy to commercially valuable information. If that information is conveyed to the competitor, it could receive an unjust commercial advantage. The existing agency regulations and guidelines do not explicitly address financial conflicts of interest that might arise by virtue of a panel member's financial stake in a private research company; nor do they address the possibility that commercially valuable information could be revealed to competitors.<sup>203</sup>

## 2. RESEARCH CONFLICT OF INTEREST

Even if a peer reviewer is not a current applicant, the reviewer may have a stake in the evaluations of applications of others in the same field.

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203. There appears to be less concern among NSF staff and NSF-funded researchers about financial conflict of interest than in NIH. The biotechnology boom hit NIH earlier than NSF, and not as many NSF-funded researchers have private positions or consultantships with private companies. Concern in NSF will no doubt grow as university-industry ties spread into other areas of scientific research such as computer sciences.

In highly competitive fields like chemistry and biotechnology, any additional advantage in the great race to make a discovery is useful.<sup>204</sup> The Kalb story is an extreme example of how a researcher with an interest in a limited resource can use his or her position as a reviewer of a competitor's grant application to enhance his or her own prospects for success.

The potential for research conflict of interest is difficult to avoid in programs like NSF's Science and Technology Centers Program that make very large grants to a small number of applicants. When virtually every major research institution in the country is a potential applicant, qualified scientists for mail reviews who are not associated with competing institutions can be hard to locate. Every outside reviewer from a competing institution knows that the chances of one institution receiving one of the ten to fifteen annual awards are higher if proposals from the other institutions receive poor evaluations. The fact that the reviewer may not participate in the consideration of his or her institution's proposal does not prevent the reviewer from commenting adversely on remaining proposals.

In some very narrow fields, eliminating potential competitors from the pool of reviewers may deplete that pool entirely.<sup>205</sup> Under the well-recognized judicial doctrine of "necessity," a judge may hear a case in which he or she has a financial stake if any qualified judge would have the same stake in the decision.<sup>206</sup> Occasions for the invocation of the doctrine of necessity are rare in legal practice, and should be equally rare in the scientific and fine arts worlds. Few legitimate fields of scientific inquiry or artistic expression are so specialized that the only persons capable of understanding and evaluating grant proposals are current or prospective grantees of the same program.<sup>207</sup> In general, a person with a pending grant application or potential future application from the same pool of funds ought not sit in judgment over his or her competitors.

The peer review process also gives researchers access to the innovative ideas of other scientists and artists in their fields, and they may use those ideas in their own research.<sup>208</sup> Indeed, some have

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204. Roy, *supra* note 172, at 319 (grant proposals are sent to "the set of colleagues who can most adequately evaluate the proposal but who also could use this same information in their own research").

205. See CHUBIN & HACKETT, *supra* note 4, at 80.

206. For example, the doctrine of necessity applied when several federal judges challenged the failure of Congress to give all federal judges a raise. Since no federal judge lacked a financial conflict-of-interest, any judge could hear the case. *Atkins v. United States*, 556 F.2d 1028, 1036 (Ct. Cl. 1977), *cert. denied*, 434 U.S. 1009 (1978).

207. See Roy, *supra* note 172, at 318-19. Roy suggests that a better definition of peer is person of equal "rank" and "experience" in science, "drawn not only from the narrow specialty, but explicitly including neighboring fields." *Id.* at 318.

208. This aspect of research conflict of interest may not be as fully applicable to the arts as to the sciences. While it is always possible for an artist or musician to steal an idea from another and use it to his or her own advantage, it would be difficult to arrange such a theft in the context of the NEA grant application process, because the projects are either

suggested that unshared access to the contents of grant proposals is the "compensation" that a reviewer receives for devoting time to the review process.<sup>209</sup> Yet when the reviewer can profit financially from information gleaned from the peer review process, the situation poses a financial conflict of interest. Even when monetary gain is not at issue, reviewer use of the peer review process to appropriate the ideas of applicants threatens the integrity of the entire peer review-based grants system. Stealing another's ideas constitutes a form of scientific misconduct that has found its way into the popular press with some frequency in recent years.<sup>210</sup> But it is an especially difficult form of wrong doing to detect and prove.

One disgruntled NIH researcher related an incident in which, after making a major discovery through research funded by the federal government, he met a prominent scientist at a convention and naively explained his theory to the scientist. The scientist complimented him on the quality of his work. When the young scientist submitted the project for competitive renewal after two years, the older scientist was highly critical of the project, and it was not renewed.<sup>211</sup> Several years later the young researcher read a paper published by the older scientist "and he did exactly what we did and published it."<sup>212</sup>

Applicants will be more circumspect in sharing information with reviewers if they know that reviewers may use it to advance their own reputations or, worse, to deprive the applicants of deserved recognition.<sup>213</sup> At the extreme, the researcher may decline to apply for grant funds until the project to be funded is nearing completion to ensure

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simply fellowships to pursue a broad activity or discrete projects that are described with such generality that the kernel of the underlying idea usually cannot effectively be appropriated.

209. See HOUSE COMMITTEE REPORT ON NSF PEER REVIEW, *supra* note 4, at 205 ("the most substantial 'rewards' for reviewing are those universally regarded as unethical or degenerate: theft or plagiarism of ideas, inside information that provides an advantage over colleagues, and a chance to forestall competitors or settle old scores").

210. For example, in 1989 the National Institutes of Health accused a prominent researcher at the Baylor School of Medicine of appropriating ideas from a manuscript that he was asked to evaluate as part of a pre-publication peer review for a scientific periodical. Michael Specter, *NIH Accuses Biologist of Stealing ideas from Rival Researcher*, WASH. POST, July 13, 1989, at A16.

211. The researcher who related this story is confident that he correctly ascertained the identity of the reviewer who made the negative comments, because the jargon used in the criticism was the same arcane jargon that the researcher had employed in the previous conversation.

212. Another researcher reported that after the wife of one of the most prominent researchers in his field sat on a study section evaluating one of his proposals, the prominent researcher suddenly began to direct his research in the direction indicated by the applicant's research proposal. This researcher could not be certain that the change in direction was attributable to information gleaned by the competing researcher's wife in the study section, and he was willing to give the competitor the benefit of the doubt. But he noted that the potential for abuse is clearly present.

213. See Darryl E. Chubin, *Open Science and Closed Science: Tradeoffs in a Democracy*, 10 SCI., TECH. & HUMAN VALUES 73, 75 (1985).

that reviewers do not have an opportunity to get a "leg up" on the applicant.<sup>214</sup>

Unlike financial conflict of interest, which is the subject of detailed regulations in many granting agencies, research conflict of interest is not explicitly regulated or even strongly discouraged. EPA has formally addressed this sort of conflict of interest in its guidelines, which provide that "no Panelists will disclose or use to their own advantage any data, concept, research protocol, or any other idea included in the applications."<sup>215</sup> However, the guidelines do not say what the consequences of disclosure or use will be. NIH guidelines suggest that reviewers "should not participate in the review of an application from a scientist with whom the reviewer has had long-standing differences which could reasonably be viewed as affecting objectivity."<sup>216</sup> This limited injunction, however, is essentially self-enforced. Even EPA has declined to adopt the prophylactic approach that is normally used to address conflicts of interest: recusal from the decisionmaking body in which the conflict of interest might arise.<sup>217</sup>

### E. Lobbying and Political Pressure

One clear threat to the objectivity of the decisionmaking process is its susceptibility to ex parte lobbying by interested persons outside of the formal channels of communications. Not only is the ex parte attempt to bend the ear of the decisionmaker unfair to those applicants that cannot make equal claims to the decisionmaker's attention, but it also suggests that the outcome of the process depends more on influence peddling than upon the merits of the applications.<sup>218</sup> If ex parte lobbying plays a role in determining who gets discretionary grants, potential applicants without

214. Roy, *supra* note 172, at 319.

215. EPA ORIENTATION HANDBOOK, *supra* note at 104, at 5.

216. NIH MANUAL 4510, *supra* note 24, at 7; NIH MANUAL 1805, *supra* note 48, at 5-6.

217. In a response to an earlier draft of this Article, the Director of EPA's Research Grants Staff noted that:

Whenever anybody who is proficient in a technical subject area reviews work of another person proficient in the same or closely allied area then a potential conflict exists since both are competitors for ideas in the same technical field. There is no way out of this short of assigning an unqualified reviewer to judge the proposal.

Papetti Interview, *supra* note 112. The validity of this argument depends upon how one defines a "qualified" reviewer. If the universe of qualified reviewers consists exclusively of those persons who can understand every technical nuance of a proposal, then the argument may be correct. If, however, the universe includes persons with a strong grounding in science who practice in a related field, then the argument has less vitality.

218. For example, few would hold out the discretionary grant process at the Department of Housing and Urban Development during the mid-1980s, where successful applicants had to secure the services of former high-level administration officials to gain access to the "real" decisionmaking process, as a model for distributing government money in an objective fashion. *See generally*, IRVING WELFELD, HUD SCANDALS: HOWLING HEADLINES AND SILENT FIASCOES 79-109 (1992).

"contacts" within the granting agency or the peer review panels will be discouraged from applying, and the quality of applications will ultimately suffer.<sup>219</sup> Similar considerations apply to attempts to pressure the decisionmaker by bringing in influential advocates from the Administration or Congress. Although high-level administration officials and congresspersons have a legitimate interest in how the agency goes about distributing government money, an objective process must proceed on the basis of objective criteria, rather than on the anticipation of legislative favors or the fear of congressional retaliation.

Fortunately, there is little indication that *ex parte* lobbying, influence peddling or outside political pressure play a significant role at any of the scientific institutions studied in this article. All of the agencies encourage potential applicants to contact agency staffers for explanations about the process of applying for a grant and advice about which of several applicable programs might be most receptive to the particular application. Some staffers in NSF are willing to advise applicants on how to make their applications more attractive to the peer reviewers who will be evaluating them. In none of the agencies studied here, however, were direct communications with peer reviewers tolerated. Similarly, while all of the agencies received status requests about particular applications from congresspersons, only rarely was political pressure brought to bear on the substantive decisionmaking process. Although granting agencies must always be on the alert for lobbying and political pressure, the infrequency of complaints suggests that major changes in the current process are not warranted.

#### IV. CONCLUSIONS AND RECOMMENDATIONS

The peer review model has proven remarkably durable and successful in the scientific context. The proof is in the pudding—the United States is a world leader in most areas of pure scientific research. Government-funded research has produced a storehouse of knowledge, and governmental expenditures have created an infrastructure of educated professionals and physical research capacity that should serve as a launching pad for still further scientific advances. One important reason for this success is the intense dedication of the scientists who devote thousands of poorly compensated hours to reviewing grant applications and sitting through seemingly endless peer review

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219. When universities began to bypass the peer review process at the major scientific granting agencies in the late 1980s to lobby Congress for direct appropriations for research projects, several prominent representatives of the academic research community passed resolutions opposing such "pork barrel" funding of scientific research. See Donald N. Langenberg, *Earmarked Appropriations: The Debate over the Method of Federal Funding*, 20 U. MICH. J.L. REF. 1029 (1987); *High Tech Goes into the Pork Barrel as Congress Helps Old Homestate U.*, 19 NAT'L J. 1350 (1987).

committee meetings.<sup>220</sup> More important than the dedication of these volunteers is their integrity, which stems largely from a sense of responsibility to the "scientific community" that nurtures and sustains them. However nebulous the notion of a community of scientists is to the person on the street, it is very real to the professionals from academia and industry who practice science in their laboratories. A consciously biased vote in a peer review panel meeting is not only a lapse in personal integrity, it is a betrayal of the larger community of professionals. In words of the Director of one of NSF's large programs: "Our whole success is based on our credibility."<sup>221</sup> Hence, instances of bribery, logrolling, and other forms of chicanery that often accompany public discretionary grants programs are virtually unheard of in the context of scientific peer review.

The peer review tradition is not as strong in the arts, social sciences and other professional areas. In the arts, where public funding is a more recent phenomenon, the sense of community is less developed, and the evaluation criteria may not be as objective. Yet because they recognize that peer review may be the only viable alternative to oppressive government-imposed content restrictions,<sup>222</sup> members of the arts community are also strong proponents of peer review. Although the peer review system seems to be working well in the arts, it has yielded results that have, to a much larger degree than in the sciences, attracted outside criticism from the lay public and politically powerful critics. To some extent, this is inherent in the subject matter. Congresspersons probably deem themselves more qualified to evaluate the quality of artistic proposals than to second guess a group of prestigious scientists.<sup>223</sup>

The peer review model's greatest strength is its ability to achieve objective assessments of competing proposals from highly qualified professionals with expertise in the area of interest.<sup>224</sup> When objective criteria can be articulated and applied by persons with training in the

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220. HOUSE SUBCOMMITTEE REPORT, *supra* note 4, at 33 ("The value of the roughly 100,000 reviews contributed free to the [National Science] Foundation by the scientific community each year is thus in the range of \$2,000,000 to \$10,000,000.").

221. Telephone interview with Dr. Bill Harris, Director, Science and Technology Centers, National Science Foundation (Nov. 20, 1990) [hereinafter Harris Interview].

222. Anthony Lewis, *Abroad At Home: Fight the Philistines*, N.Y. TIMES, June 8, 1990, at A31 ("When politicians get into the business of deciding what is legitimate art, the game is up. That is why the NEA was originally set up in a way that insulated grant decisions from political pressure, with peer review committees playing a crucial role.").

223. Public opinion polls on peer review in the arts are mixed. In a Gallup/Newsweek poll of 500 randomly selected adults conducted on Jun. 23, 1989, 20% of the respondents had no opinion, and 58% favored allowing expert panels, rather than federal officials, to award the grants. On the other hand, an *L.A. Times* poll of 2,217 adults on Sep. 20, 1989, indicated that "among those people informed about and supporting government funding, 43% preferred the 'public voting on which artists should get funding' to selection by a peer group of artists by 'other artists' (26%) or by 'government experts' (14%)." Gladys Engel Lang & Kurt Lang, *Public Opinion and the Helms Amendment*, 21 J. ARTS MANAGEMENT & LAW 127, 133-35 (1991).

224. See HOUSE COMMITTEE REPORT ON NSF PEER REVIEW, *supra* note 4, at 32-33.

relevant field, peer review is an exceedingly effective vehicle for shielding the decisionmaking process from extraneous and inappropriate considerations. In addition, because the applicants are being judged by their peers (or in many cases their "betters"), they are generally inclined to accept the outcome. Indeed, the peer review system is a method for rewarding excellence in the arts and sciences quite apart from the monetary support that comes from funding decisions.<sup>225</sup> Because it involves the input of many reviewers, it is generally not perceived as being autocratic or arbitrary. Finally, peer review helps to shield governmental decisionmakers from the political pressures that usually exist when a bureaucracy has the power to dole out public dollars. This is especially important in the arts, where the pressures to impose a narrow cultural uniformity on government funded art are great.<sup>226</sup>

Despite its obvious virtues, the above description of the peer review process in action revealed several potential weaknesses. Some are inherent in the concept of peer review and are not easily addressed without changing the character of the process. Other infirmities can be cured, but change always comes at a price, either in the form of additional resources that must be devoted to the process or in the form of reduced efficiency. Too much change can throw the system irrevocably out of kilter. One of the mystifying aspects of peer review is the fact that so many highly trained and extremely busy people are willing to devote so much time to the process for so little compensation. While the prestige that accompanies selection to a peer review panel is an important form of compensation in the academic community, reforms that add to the reviewers' burdens may offer a further disincentive to undertake an already unattractive task. According to some staffers in the scientific agencies, scientists are becoming less reticent to decline invitations to become peer reviewers, and it is therefore becoming more difficult to assemble panels with the right expertise to evaluate some applications. These problems may only multiply in the future as more academic scientists spend more of their time in lucrative consulting relationships. When the alternative to serving on a peer review committee is \$200 per hour in consulting fees, prominent scientists may tend to opt for the latter. Reformers should therefore be wary of introducing too many changes into a system that is working tolerably well in most contexts.

After examining the threshold question of whether peer review should be abandoned altogether in favor of a lottery or a "strong manager" model of grant allocation, this section of the article will explore

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225. William O'Rourke, *Protesting NEA: National Endowment for the Arts and Jesse Helms' Obscenity Crusade*, NATION, June 25, 1990, at 880 (peer review "is one of the few acts of approval and applause in the art world that is out of the market loop, beyond the reach of the gatekeepers and taste-makers, those who are involved directly in the commercialization of art").

226. See Owen M. Fiss, *State Activism and State Censorship*, 100 YALE L.J. 2087 (1991) (characterizing the Mapplethorpe exhibit as "a considerable achievement," presenting "an aesthetic vision that is original and in many respects stunning").

some possible "patch and repair" solutions to the bias problem and make some relatively modest recommendations for change. The fact that nearly all of the changes suggested here have already been implemented in one or more of the peer review granting agencies studied in connection with this Article suggests that most of them should not be unduly burdensome.

### A. Radical Alternatives to Peer Review

Peer review is but one of a wide variety of models for allocating public funds to deserving applicants. For example, the agency staff could screen all applications for an initial threshold showing of competence and relevance and then conduct a lottery to determine which of the meritorious proposals to fund. While this approach would be utterly free of the favoritism, animus, tunnel vision, and conflict of interest that can afflict the peer review process, it would not meet the programmatic goal of awarding limited monies to the "best" projects.<sup>227</sup> In contexts in which society can place little confidence in the ability of human beings (even with considerable expertise) to select the "best" from among a group of otherwise acceptable alternatives, a lottery is an exceedingly efficient way to make the choice.<sup>228</sup> Alternatively, society can trust informed experts objectively to pick the best proposals from among a pool of good proposals in most scientific grants programs. Whether the public may place the same confidence in the ability of experts to distinguish the best art and music from among a host of acceptable proposals is more debatable. At this juncture, however, Congress has elected not to fund the arts through a lottery. Despite periodic controversies over public funding of the arts, few would second-guess this decision.

Assuming that it is possible to choose the "best" proposals in an objective way according to predetermined criteria, why should the entity making that choice be a group of the applicants' professional peers? The most frequently encountered alternative to peer review is the "strong manager" model commonly used in awarding government contracts. Rustrum Roy, a frequent and persistent critic of peer review, has suggested a specific strong manager model for funding scientific research under which the permanent agency staff would choose the winners pursuant to a rather rigid formula. Roy begins with the proposition that agencies should award grants to institutional departments, not individual researchers, on the basis of the applicant's past productivity in the relevant field. An academic department's productivity would be measured by the number of papers published in agreed-upon journals, the number of M.S. and Ph.D. degrees granted, the aggregate research

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227. See CHUBIN & HACKETT, *supra* note 4, at 198.

228. See 28 U.S.C. § 2112(a)(3) (1988) (random selection of court of appeals by judicial panel on multi-district litigation); Thomas O. McGarity, *Multi-Party Forum Shopping for Appellate Review of Administrative Action*, 129 U. PA. L. REV. 302, 371-75 (1980).

support from all mission-oriented agencies for the faculty and the total support for research from industry.<sup>229</sup>

Roy's simple formula for determining the total sum to be granted to a department or interdisciplinary laboratory is:

$$\begin{aligned} & A \times (\text{number of publications}) + \\ & B \times (\text{weighted number of advanced degrees}) + \\ & C \times (\text{sum received for research from mission-oriented agencies}) + \\ & D \times (\text{sum received for research from private industry}). \end{aligned}$$

Each agency would adjust the weighting factors, A, B, C and D, so that the sum of the money distributed to all institutions would be equal to the total budget.<sup>230</sup> The strong manager model thus institutionalizes the "halo effect." The most heavily credentialed researchers would tend to get funding, whether or not they could write persuasive proposals. An agency could incorporate an element of peer review into the system by allowing a panel of peers to evaluate the credentials and immediate past performance of individuals in the applicant department.<sup>231</sup>

The strong manager alternative has several advantages over the peer review model. First, it is less expensive. The resources devoted to assembling peer review panels would instead be available for funding research under the strong manager model. Prestigious and highly productive professionals, who would otherwise spend time writing proposals and engaging in peer review evaluations, could spend more time on their own research and other creative endeavors. Especially in programs in which a very large number of qualified applicants are competing for a small number of grants, it seems wasteful to demand that productive professionals spend large amounts of time writing and evaluating proposals, no one of which has a high probability of success. The strong manager model only requires a staff composed of competent, but not necessarily prestigious, professionals who are capable of applying the formula in a consistent manner.

Second, the strong manager model places past productivity ahead of the applicant's ability to draft an attractive proposal. According to Roy, "only the most sanguine advocate unfamiliar with the literature would claim that there is any basis for expecting a correlation between a scientist's ability to present an essay and the actual future production of the 'best science.'"<sup>232</sup> A National Academy of Sciences study of peer

229. Rustum Roy, *Peer Reviewed Propductivity-Based Formula for Funding University Research*, 22 MINERVA 316 (1984), reprinted in TASK FORCE ON SCIENCE POLICY, HOUSE COMMITTEE ON SCIENCE AND TECHNOLOGY, RESEACH PROJECT SELECTION HEARINGS at 24.

230. Roy, *supra* note 172, at 322.

231. Roy, *supra* note 229, at 24, 40.

232. Roy, *supra* note 172, at 318; see also Roy, *supra* note 229, at 48. The recent report of the NSF Merit Review Task Force suggested that more attention be devoted to an applicant's past track record. MERIT REVIEW REPORT *supra* note 59, at 15-16. The report cited favorably the model of the Natural Sciences and Engineering Research Council of Canada, in which proposals from established investigators focus more on the recent track

review in NSF did not find a high correlation between grants awarded and measures of previous scientific performance of the applicants, and there was some indication that chance played a large role in grant awards under the peer review model.<sup>233</sup> To the extent that the track record of an applicant institution is a more objective predictor of future performance, the strong manager model may yield better results.

Third, the strong manager model eliminates the potential for research conflict of interest that exists in the peer review model because an applicant's competitors are not in a position to affect the outcomes of the applicant's proposals. Moreover, until the agency has made a final decision on whether to fund a project, the applicant's ideas need not be disclosed to anyone other than the agency staff. The ideas are therefore unavailable for appropriation by peer reviewers.

Fourth, the strong manager model can provide the continuity necessary for a sustained and successful research program. Institutions that produce high quality research on a continuous basis can be assured of funding over the long haul.<sup>234</sup> Researchers in these institutions can pursue "chance leads" that arise in their research without fear that they will stray too far from the project that was funded.<sup>235</sup>

Fifth, the strong manager model is appropriate for granting agencies with clearly defined missions that may vary from the policy preferences of peer reviewers afflicted by tunnel vision.<sup>236</sup> Roy notes that peer review is not used widely by mission-oriented agencies like the Department of Defense, NASA, the Bureau of Mines, or the Department of Energy. In particular, he notes that the highly successful Office of Naval Research and the Defense Advanced Research Projects Agency have never used peer review and continues to use a strong manager system.<sup>237</sup>

The strong manager model thus institutionalizes the "halo effect." The most heavily credentialed researchers would tend to get funding, whether or not they could write persuasive proposals. There would be an

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record, while new investigators follow a different proposal format that emphasizes the potential for creative work.

233. Cole et al., *supra* note 72, at 885. The study concluded that approximately 25% of panel decisions would be reversed by a different panel. "Since the reversal rate is about 25%, we may conclude that the fate of a particular grant application is roughly half determined by the characteristics of the proposal and the principal investigator, and about half by apparently random events which might be characterized as the 'luck of the reviewer draw.'" *Id.*; see also Alan H. Clark, *Luck, Merit and Peer Review*, 215 SCIENCE 11 (1982) (arguing that this fact does not justify eliminating the peer review model for awarding grants).

234. According to Roy, "[a] great advantage of the [strong manager] system is that no step-function changes up or down are possible, preserving the continuity essential in long-term basic research." Roy, *supra* note 229, at 24.

235. Roy, *supra* note 172, at 319.

236. HOUSE COMMITTEE REPORT ON NSF PEER REVIEW, *supra* note 4, at 39 (testimony of Rustrum Roy).

237. Roy, *supra* note 229, at 47. For a brief description of the granting system at the Office of Naval Research in the 1970s, see HOUSE COMMITTEE REPORT ON NSF PEER REVIEW *supra* note 4, at 20.

effective entitlement to funding until such time as the researcher demonstrated that he could no longer perform good research.

Perhaps the greatest drawback of the strong manager alternative to peer review is the potential for cronyism and even corruption at the staff level. This problem, which is sometimes referred to as "staff abuse,"<sup>238</sup> seems endemic in governmental programs in which a few relatively unaccountable low-level governmental officials retain a great deal of discretion. EPA's experience in the early 1980s and the experience of the Department of Housing and Urban Development with discretionary grants in the mid-1980s should give pause to anyone who would advocate wholesale substitutions of agency staff for peer reviewers.<sup>239</sup>

Because the strong manager model focuses heavily upon past accomplishments, it also tends to dissuade newcomers. Roy would shield against this tendency by allowing any institution that adds new faculty members to receive one or more extra credits equal to the average research support for the institutional faculty.<sup>240</sup> However, this would not allow an institution to achieve prominence by building from the ground up, and it would impede attempts to shift funding out of moribund departments. It would also tend to increase the disparity between the "have" and "have not" institutions, because the best researchers tend to locate at the most prestigious institutions.<sup>241</sup>

Moreover, the efficiency advantages of the strong manager model can be overemphasized. While awarding a smaller number of multi-year grants to a few departments would reduce the resources devoted to the awards process at the front end, it might lead to more protective procedures at the back end when the agency decided to "nonrenew" a grant. Applicants might begin to view discretionary grants as entitlements.

Finally, by placing heavy reliance upon publications, Roy's formula-based version of the strong manager model would to some extent simply shift the locus of peer review from the grants process to the private sector journal peer review process where governmental privacy and due process protections are not applicable and where there may be even fewer protections against bias.<sup>242</sup>

In sum, the case for abandoning the peer review model for awarding discretionary grants in the arts and sciences is far from compelling. In the main, peer review seems to be functioning fairly efficiently, and the occasional criticisms of the process in practice do not appear to warrant wholesale rejection of the model. Because it can be biased against mavericks, however, the peer review model can be counterproductive in programs designed to explore fresh ideas and

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238. HOUSE COMMITTEE REPORT ON NSF PEER REVIEW, *supra* note 4, at 25.

239. See generally, WELFELD, *supra* note 218.

240. Roy, *supra* note 11, at 79.

241. See CHUBIN & HACKETT, *supra* note 4, at 42.

242. See *id.* at 201.

innovative approaches. Rather than shift completely to the strong manager model, such programs might emulate NSF's recently adopted "expedited awards" system in which each Program can set aside a small percentage of its budget for grants of limited amount and duration to be awarded by the staff without peer review. If the seed grants bear fruit, the mavericks should have a better chance to prove the merits of their ideas to peer reviewers in the next funding cycle.<sup>243</sup>

## B. Openness and Accountability

Bias can flourish in closed peer review systems in which panel meetings are conducted in private, mail reviews are unavailable for rebuttal by rejected applicants, and the relevant economic and research interests of the reviewers remain undisclosed. By its very nature, peer review tends to be secretive and unaccountable to applicants and the general public.<sup>244</sup> On the theory that "sunlight is . . . the best disinfectant,"<sup>245</sup> one relatively modest protection against bias in peer review is to open the process up to greater scrutiny by affected applicants and the public.<sup>246</sup> The peer review systems in NIH, EPA and NSF have generally moved in the direction of greater openness and accountability, some agencies more rapidly than others. The evolution in the scientific agencies toward greater openness has mirrored a general opening up of the bureaucratic processes under the Freedom of Information Act (FOIA),<sup>247</sup> the Federal Advisory Committee Act (FACA),<sup>248</sup> and the Privacy Act,<sup>249</sup> all three of which apply directly to various aspects of the peer review process in the granting agencies.

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243. In 1989, an NSF-appointed panel examined the recently implemented program and concluded that it was an excellent vehicle for funding "untested and novel ideas, ventures into emerging research areas, new expertise and approaches to 'old' topics, and new multi-disciplinary work." Bjerklie, *supra* note 63.

244. Two longtime students of the peer review process observe that:

Peer review is an intensely private process that originates within a scientist's mind, continues on paper as a bureaucratic procedure, and ends behind the closed doors of a funding agency. The process is at nearly all points inaccessible, opaque, and heavily infused with the values and interests of stakeholders. Peer review leaves few clues in the public domain, and many participants in the system insist on minimizing public access to information.

CHUBIN & HACKETT, *supra* note 4, at 50.

245. LOUIS D. BRANDEIS, *OTHER PEOPLE'S MONEY* 92 (1914) ("Sunlight is said to be the best of disinfectants; electric light the most efficient policeman.").

246. The House subcommittee that studied peer review in NSF in 1976 recommended that NSF attempt to achieve "[t]he greatest degree of openness [in the] award-decision making process consonant with effective proposal evaluation and reasonable efficiency." HOUSE COMMITTEE REPORT ON NSF PEER REVIEW, *supra* note 4, at 5.

247. 5 U.S.C. § 552 (1988).

248. *Id.* app. § 2.

249. *Id.* § 552b.

## 1. THE EXISTING LEGAL REGIME

The FOIA requires every federal agency to make available to any person any record in the agency's possession upon request. This broad requirement has several important exemptions. The exemptions most relevant to peer review in granting agencies are exemptions (4), (5) and (6). Exemption (4) includes "trade secrets and commercial or financial information obtained from a person and privileged or confidential," and exemption (5) covers "inter-agency or intra-agency memorandums or letters which would not be available by law to a party other than an agency in litigation with the agency." Exemption (6) applies to "personnel and medical files and similar files the disclosure of which would constitute a clearly unwarranted invasion of personal privacy."<sup>250</sup>

The FACA requires federal agencies that rely upon recommendations of advisory committees to charter those committees.<sup>251</sup> The FACA defines the term "advisory committee" to include any committees that are "utilized" by federal agencies "in the interest of obtaining advice or recommendations." Peer review committees clearly come within this definition.<sup>252</sup> Each advisory committee's charter must set out the committee's objectives, duties, number and frequency of meetings, and termination date. Insofar as the Government in the Sunshine Act does not provide otherwise,<sup>253</sup> the agency must give public notice of all advisory committee meetings, make them "open to the public," and permit interested persons to attend and file statements.<sup>254</sup> The Government in the Sunshine Act allows an agency to close meetings or portions of meetings where an open meeting might result in disclosure of, *inter alia*, trade secret and commercial or financial information that is privileged or confidential, or information "of a personal nature where disclosure would constitute a clearly unwarranted invasion of personal privacy."<sup>255</sup> The agency must prepare minutes for advisory committee meetings and make those minutes available to the public, subject to the exemptions in the Freedom of Information Act.<sup>256</sup> Transcripts of advisory committee meetings must also be provided to the public, subject to the same exemptions.<sup>257</sup>

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250. *Id.* § 552(b)(4), (5), (6).

251. *Id.* App. § 9(c); *see also* GENERAL ACCOUNTING OFFICE, PEER REVIEW: COMPLIANCE WITH THE PRIVACY ACT AND FEDERAL ADVISORY COMMITTEE ACT 4 (1991) (reporting that most agencies studied in the report chartered peer review committees as advisory committees under FACA).

252. *See* Memorandum Opinion for the General Counsel, National Endowment for the Humanities, from Leon Ulman, Deputy Assistant Attorney General, Office of Legal Counsel (Aug. 18, 1980) (mimeo, copy on file with author) [hereinafter Memorandum Opinion].

253. 5 U.S.C. app. § 10(d) (1988).

254. *Id.* app. § 10(a)(1), (3).

255. *Id.* § 552b(c)(3), (4), (6).

256. *Id.* app. § 10(b), (c).

257. *Id.* app. § 11(a).

The Privacy Act requires federal agencies to protect personal information in agency files from unauthorized disclosure, to publish descriptions of the existence and nature of the records containing personal information, and to allow individuals to review and copy information about themselves and to demand that the agency correct any information that is not accurate, relevant, complete or timely.<sup>258</sup> The agency must either make the requested correction or inform the individual of its reasons for failing to do so. An individual whose request is denied may secure a review of that decision within 30 days.<sup>259</sup> However, the Act only applies to "systems of records" from which the agency retrieves records by the individual's name or other personal identifier. This latter qualification has proven controversial and difficult to interpret. The Privacy Act also contains several exemptions, one of which is for "investigatory material compiled solely for the purpose of determining suitability, eligibility, or qualifications for Federal civilian employment . . . [or] Federal contracts," but only "to the extent that the disclosure of such material would reveal the identity of a source who furnished information to the Government under an express promise that the identity of the source would be held in confidence."<sup>260</sup>

## 2. OPEN MEETINGS

Most peer review granting agencies facilitate openness and accountability by holding open committee meetings. Open meetings allow outsiders to observe any overt bias in the decisionmaking process. Even when meetings are legitimately closed to the public to protect privacy interests or to preserve candor, each committee member has the opportunity to observe the demeanor of the others and to challenge their evaluations. A committee member who would play favorites or blackball an applicant must be prepared to meet the honest inquiries of fellow experts on the committee. Hence, bringing all of the reviewers together to discuss their opinions can be a powerful shield against favoritism and animus.<sup>261</sup> All of the granting agencies studied in this article provide for peer review panels, and some assemble more than one group of peers for a single round of evaluations.<sup>262</sup>

The principal disadvantage of panel meetings is the expense, in terms of both the resources required to bring the experts together and the valuable time of productive professionals consumed in travel and meetings. Meetings are always less efficient than one-on-one

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258. *Id.* § 552a(b), (d), (e).

259. *Id.* § 552a(d)(3). The agency may extend the review period another 30 days for good cause.

260. *Id.* § 552a(k)(5).

261. HOUSE COMMITTEE REPORT ON NSF PEER REVIEW, *supra* note 4, at 37-38.

262. NSF relies upon mail reviews without meetings for many of its programs, but the staff always has the option to assemble the outside reviewers for a meeting to discuss all of the proposals.

communications. In addition, since upper level decisionmakers are usually reluctant to reach results that differ greatly from a panel's recommendations, meetings can reduce the discretion of these politically accountable officials.<sup>263</sup> Finally, meetings can facilitate old boyism and the halo effect, and they will not necessarily limit any tendency of peer reviewers to downgrade mavericks.

The effort nevertheless seems warranted in most cases. Where expense is a genuine constraint, alternatives exist to facilitate peer review meetings at a low overall cost. For example, it should be relatively inexpensive in the context of NSF mail reviews to circulate written reviews to each of the reviewers and conduct a single conference telephone call to discuss and possibly amend the reviews. Such an informal meeting could greatly enlighten the agency staffer who must rank the proposals for upper level decisionmakers. It could also provide valuable feedback to the reviewers, currently unavailable in the mail review system, on how their peers evaluated the same proposals.

Assembling the reviewers for a meeting by telephone will usually subject the process to the constraints of FACA. With several important exceptions, meetings subject to FACA must be open to the public. Although it may be difficult to open telephone conference calls to the general public, it may be feasible to invite interested members of the public to listen to the contents of the conversations either in person or on tape. The extent to which the meetings should be open to the public and minutes and transcripts be made available to applicants and the public will be discussed below. The point here is that there is virtue in meetings, whether or not their contents are open to applicants and/or the public.

### C. Feedback and Rebuttal

The decision not to fund a grant application can have serious consequences for an academic researcher's career. Younger scientists at prestigious institutions have no hope of becoming tenured if they do not have at least one NIH or NSF grant. Denying a grant to a more established researcher can close his or her laboratory and effectively end his or her career as a productive researcher.<sup>264</sup> For some artists and musicians, NEA grants are a principal source of livelihood. A rejected applicant in any of these agencies understandably wants to know why the funding agency took that potentially devastating action. If the applicant discovers that a mistake was made in the evaluation, fairness demands that he or she have an opportunity to correct the error and to rebut the decision not to fund before the final funding decision is made.

One of the most powerful procedural protections against bias is the requirement that the decisionmaker state his or her reasons for a

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263. See HOUSE COMMITTEE REPORT ON NSF PEER REVIEW, *supra* note 4, at 38.

264. See William Booth, *Biomedical Scientists Cite Funding "Crisis,"* WASH. POST, June 29, 1990, at A25 (reporting statements made at a National Academy of Sciences Forum on the crisis in research funding); Kolata, *supra* note 17 (same).

decision.<sup>265</sup> Just as judges in the legal system must provide reasons for their exercise of judicial power, peer reviewers could be required to provide a statement of reasons to rejected applicants. However, a reasons requirement is not an adequate panacea for bias. Any sophisticated observer of the legal and administrative process knows that an agency's statement of reasons can be a post hoc rationalization for a decision reached upon improper grounds. Nevertheless, forcing the peer reviewers to state their reasons for rejection can enhance the acceptability of the decisions among the pool of rejected applicants, and these reasons can help them improve future applications.<sup>266</sup> The legitimacy of the process can be further enhanced by providing the rejected applicant with an opportunity to bring to the agency's attention any factual errors underlying its rationale and to rebut any biased conclusions. Although an opportunity to rebut has the potential for delaying the grant process, it can avoid the embarrassment that attends erroneous or biased decisions.

### 1. CURRENT AGENCY PRACTICE

The agencies studied here vary in the extent to which they offer opportunities for feedback and rebuttal. NIH provides applicants with a statement of reasons in the form of a pink copy of the evaluation of the peer review committee. However, applicants cannot gain access to the actual minutes or transcripts of the panel meetings or to any evaluations written by individual panel members. Indeed, the pink sheets are sanitized to a limited extent by the Program Directors who typically return to the Scientific Review Administrators any which contain derogatory statements or obvious factual errors. In the minds of some rejected applicants, the pink sheets do not provide the real reasons for poor reviews.

Ironically, because it is willing to share summary statements with the applicants, NIH invites challenges based upon factual inaccuracies that inevitably creep into these written reviews. An applicant justifiably feels unfairly treated when the Institute's explanation contains factual errors, even if the project probably would not have been funded in the absence of the errors. NIH provides applicants with an opportunity to cure any errors on the pink sheets prior to submission to the Advisory Councils, but given the limited substantive role that the Advisory Councils play, it is highly unlikely that rebuttals will affect the rankings at that level.

In the past, the only option for a rejected NSF applicant was to telephone the relevant Program Officer for an explanation. These

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265. See, e.g., *International Harvester Co. v. Ruckelshaus*, 478 F.2d 615 (D.C. Cir. 1973); Henry J. Friendly, *Some Kind of Hearing*, 123 U. PA. L. REV. 1267, 1292 (1975).

266. After conducting extensive hearings into the peer review at NSF in 1076, a House subcommittee recommended that "[t]he Foundation should include in each letter announcing a funding decision to an applicant either a statement of the methods and rationale of the decision or a statement that such information will be provided on request." HOUSE COMMITTEE REPORT ON NSF PEER REVIEW, *supra* note 4.

sometimes impassioned encounters could take their toll on the morale of the Program Officers, especially when they could not share the peer reviewers' reports with the rejected applicants. NSF's recently implemented policy of making redacted versions of all reviews, notes of telephone conversations with reviewers, and summaries of the contents of any panel meetings available to applicants after the agency's final decision should help to alleviate this situation. NSF applicants will now have access to six to eight individual reviews, as compared to the comments of two panel members that are included in NIH "pink sheets." Unlike NIH, however, NSF does not provide a rejected applicant with an opportunity for rebuttal.

EPA's Privacy Act regulations appear on the surface to provide substantial feedback to rejected applicants. In theory, applicants may see all documents generated during the review of their grant applications, including site visit reports, summary statements, and reviewers' written comments, but only if these documents are still available at the time of the request. Since the staff discards all written documentation after the summary statement is complete, as a practical matter applicants cannot secure verbatim copies of reviewers' written comments, and they can never see their individual scores.<sup>267</sup> As in NSF, rejected EPA applicants have no opportunity for rebuttal.

NEA encourages rejected applicants to contact the program specialists assigned to their project for explanations and suggestions for future applications. A summary of the relevant panel's deliberations is available to any applicant that requests one,<sup>268</sup> but, unlike NIH pink sheets, the agency does not routinely provide them. The agency does not routinely share staff notes and minutes of panel meetings with applicants or any other outsiders, and tapes of panel meetings are never made available. Some Program Specialists are willing to describe in detail the considerations that motivated the panelists; others only send out a form letter containing the applicant's score. In the past, the portions of Advisory Council meetings devoted to discussions of individual applications were closed to the public, but the Council in May 1990 decided to open these sessions to public scrutiny.<sup>269</sup> NEA applicants have no opportunity to rebut panel conclusions, and a rejected applicant may appeal a final decision only if an NEA official is willing to come to his or her aid.

With the exception of NEA, all of the agencies studied here provide formal opportunities for rejected applicants to appeal after the funding cycle has run its course, and conflict of interest or bias on the part of a peer reviewer is generally an appropriate ground for appeal.<sup>270</sup> However,

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267. Papetti Interview, *supra* note 112.

268. McLaughlin Comments, *supra* note 121.

269. INDEPENDENT COMMISSION REPORT, *supra* note 126.

270. ENVIRONMENTAL PROTECTION AGENCY, ASSISTANCE ADMINISTRATION MANUAL 35-1 (1984); National Foundation on the Arts and the Humanities, Federal Assistance;

formal appeals are almost never taken for several reasons. First, the appeal procedures are generally quite formal, requiring a substantial investment of time and resources. Second, the burden of proving bias or procedural impropriety is on the person taking the appeal. Third, because the funds for the relevant competition have already been expended by the time an appeal is concluded, it is not clear what the successful appellant's remedy would be. Finally, the formal appeals process is so time-consuming that it is usually less troublesome to refine the rejected proposal and resubmit it during the next funding cycle.

## 2. THE EXISTING LEGAL REGIME

The FOIA and the FACA require granting agencies to provide some feedback to rejected applicants as members of the general public. The Privacy Act goes beyond FOIA and FACA to make particular information about individuals available to those individuals even when that information need not be disclosed to the general public. Thus, the question as to whether feedback is appropriate has to some extent already been decided by Congress, and the granting agencies are obliged to follow the statutory directives.

The Privacy Act requires federal agencies that maintain a system of records in which the records of individuals are identifiable to allow individuals to review and copy information about themselves, and FOIA similarly requires agencies to provide copies of agency documents to any person. But neither statute requires that the agency generate any written information that it would not otherwise prepare; nor do they require the agency to maintain information in the applicants' files for any particular length of time. Thus, for example, an applicant for an EPA grant is theoretically entitled to see the written evaluations of individual reviewers, but the evaluations are in the agency's file only for as long as it takes the agency staffers to incorporate their substance into a "Summary Statement." Thus, as a practical matter, the applicant does not have access to the written reviews. Although this no doubt violates the spirit of the Privacy Act, it is probably not unlawful.

The FACA gives applicants the right to observe peer review committee meetings, and it further requires that all "records, reports, transcripts, . . . working papers, . . . studies, . . . or other documents which were made available to or prepared for" advisory committees be available for public inspection.<sup>271</sup> But FACA also allows agencies to close advisory committee meetings to the public when necessary to protect trade secrecy and personal privacy, and the right to inspect documents is subject to the exemptions in FOIA.

The public availability of committee working papers, including initial peer reviews, under FOIA raises several complex legal issues, some

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Reconsideration of Declined Applications, 61 Fed. Reg. 13118 (1983); NIH GUIDE, *supra* note 53; NOTICE TO PRESIDENTS, *supra* note 100.

271. 5 U.S.C. app. § 10(b) (1988).

of which have been answered in the seminal case of *Washington Research Project, Inc. v. Dept. of Health, Education and Welfare*.<sup>272</sup> In that case an organization sought information on eleven projects that NIH had funded through the National Institute of Mental Health to study the effects of psychotropic drugs on the behavior of children with certain learning disabilities. In particular, it sought the grant applications and information collected pursuant to the peer reviews. At that time, NIH only publicized a list of research grants it had most recently awarded, including a general description of each project and its budget. The agency claimed that all of the requested information came within exemptions (4), (5) and (6) of FOIA.

The court of appeals first rejected the agency's argument that a grant application was protected from disclosure by the trade secret exemption (exemption (4)), noting that the exemption was "not necessarily coextensive with the existence of competition in any form."<sup>273</sup> Thus, despite the fact that the ideas contained in research grant proposals were the researcher's "stock in trade," they were not protected, because they were not commercial. The court concluded:

It is clear enough that a non-commercial scientist's research design is not literally a trade secret or item of commercial information, for it defies common sense to pretend that the scientist is engaged in trade or commerce.<sup>274</sup>

In a footnote, the court noted that NIH regulations at that time precluded grant awards to for-profit institutions.<sup>275</sup>

However, the court held that the pink slips and site visit reports (and presumably reviewer reports to peer review panels) were protected by exemption (5), the exemption for internal agency documents. Although a peer review panel was not itself a federal agency, it was "performing staff functions through the medium of outside consultancy."<sup>276</sup> Thus, while exemption (5) did not shield purely factual material, it did allow an agency to refuse to disclose "materials reflecting deliberative or policy-making processes."<sup>277</sup> Even purely factual matter could be exempt if it was "inextricable without compromise of the deliberative process."<sup>278</sup> Similarly, the agency could withhold a summary of factual information that was part of the deliberative process. Applying these statutory principles, the court concluded that most of the material in the site visits and pink sheets did not have to be disclosed. In particular, the factual material in the pink sheets was sufficiently connected to the

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272. 504 F.2d 238 (D.C. Cir. 1974), cert. denied, 421 U.S. 963 (1975).

273. 504 F.2d at 244.

274. *Id.*

275. *Id.* at 244 n.6.

276. *Id.* at 246.

277. *Id.* at 249 (quoting *Environmental Protection Agency v. Mink*, 410 U.S. 73, 89 (1973)).

278. 504 F.2d at 249.

deliberative process so as to preclude disclosure of any information contained therein.

FACA does not have a similar "internal deliberations" exemption, because the whole purpose of FACA is to open up such deliberations to the public. Thus the primary rationale for declining to make peer review evaluations available to requesters under FOIA is unavailable to requests under FACA to attend peer review committee meetings and to have access to materials relied upon and discussed at those meetings. The *Washington Research Project* court's resolution of the trade secrecy question would seem to govern both FOIA and FACA requests, and thus preclude that rationale for limiting public access to peer review documents.

However, recent developments may have undermined the *Washington Research Project* holding that a scientist's research design is not a trade secret. NIH has changed its policy of not funding private research enterprises, and some academic scientists have become wealthy as a result of research programs initially funded by NIH. In the booming area of biotechnology, lucrative partnerships and consultantships are no longer the exception to the general rule that academic scientists are devoted, but poorly compensated, seekers of scientific truth. In short, it no longer "defies common sense to pretend that the scientist is engaged in trade or commerce." Yet even if the trade secrecy exemption may be applicable to some grant applications in the area of biotechnology, the *Washington Research Project* rationale would still seem to preclude using the trade secrecy exemption to shield from public disclosure peer review information about applications in other hard sciences, the social sciences and the arts.

However, the FACA has an additional exemption covering an advisory committee's consideration of matters for which meetings may be closed under the Government in the Sunshine Act: information "of a personal nature where disclosure would constitute a clearly unwarranted invasion of personal privacy." This exemption is considerably broader than FOIA's exemption for "personnel and medical files and similar files the disclosure of which would constitute a clearly unwarranted invasion of personal privacy." Arguably, peer review evaluations are "of a personal nature" to both the reviewer and the applicant. A reviewer's comments are personal in the sense that they do not reflect the ideas or assessments of other persons. On the other hand, the agencies urge peer reviewers to evaluate applications without regard to personal considerations.<sup>279</sup> Similarly, career-oriented information is generally considered professional, rather than personal, from the perspective of the applicant. If a reviewer's comments are of a personal nature, then the agency could reasonably conclude that disclosing them to the public would constitute an unwarranted invasion of personal privacy. On the

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279. See Memorandum Opinion, *supra* note 252 ("[T]o invoke a Sunshine Act exemption, a more specific justification must be found to exist than merely a generalized need to protect candor in advisory committee deliberations.").

other hand, it is not obvious how disclosing the comments of other persons on the applicant's proposal constitutes a clearly unwarranted invasion of the applicant's personal privacy.<sup>280</sup> While the case for closing peer review panel meetings to the public under the FACA is plausible, it is not especially compelling.<sup>281</sup>

Assuming that the granting agencies can shield most peer review information from public view, the Privacy Act may still require the agencies to share such information with the applicants themselves. This statute requires agencies to allow individuals to review and copy information about themselves in agency files. The Act lacks the trade secrecy, internal agency deliberation and personal privacy exemptions, but it contains at least one exemption that may be applicable to peer review evaluations. Agencies may promulgate rules to exempt records that constitute "investigatory material compiled solely for the purpose of determining suitability, eligibility, or qualifications for civilian employment or federal contracts to the extent that the disclosure of such material would reveal the identity of a source who furnished information to the government under an express promise that the identity of the source would be held in confidence." This exemption would appear to be applicable to peer review documents concerning discretionary grant applications if the word "contracts" includes discretionary grants. Although the subject of great debate between the executive branch and Congress, this question has not been resolved by a court. The American

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280. A memorandum prepared by the General Counsel of the National Endowment for the Arts found that resolution of the issue involved a balancing analysis:

The subjects to be discussed with respect to applications for financial assistance could well include, for example, an applicant's abilities in his field, his reputation among his colleagues, and his professional background in performance. These topics would certainly appear to involve the type of personal information in which an applicant has a privacy interest . . . . But the fact that an applicant has a legitimate privacy interest in a closed committee meeting does not end the inquiry. The agency must also determine that the privacy interest is not *de minimis* and is not outweighed by countervailing interests in openness.

Memorandum Opinion, *supra* note 252.

281. The legislative history of the addition of the Sunshine Act exemptions to the Federal Advisory Committee Act is not especially enlightening. The Conference Committee Report speaks directly to the issue of peer review panels, but does not resolve it:

The conferees . . . are concerned about the possible effect of this amendment upon the peer review and clinical trial preliminary data review systems of the National Institutes of Health. The conferees thus wish to state as clearly as possible that personal data, such as individual medical information, is especially sensitive and should be given appropriate protection to prevent clearly unwarranted invasions of individual privacy. While the conferees are sympathetic to the concerns expressed by NIH . . . the conferees are equally sympathetic to concerns expressed by citizen's groups that important fiscal and health-related information not be unnecessarily withheld from the public.

H.R. CONF. REP. No. 1441, 94th Cong., 2d Sess. 26 (1976).

Law Division of the Congressional Research Service has concluded that the word "contract" in the exemption does not include discretionary grants,<sup>282</sup> but the General Counsel of NSF has concluded that it does.<sup>283</sup>

NSF takes the position that federal grants and awards are a subset of the broader category of federal contracts, and it argues that in the context of research grants the terms are interchangeable.<sup>284</sup> CRS argues that contracts and grants are distinct entities. Contracts are limited to civilian and military personnel employment and traditional procurement contexts, whereas grants involve less supervised dispersals of government largess without a well-defined *quid pro quo*.<sup>285</sup> The statute is at best ambiguous, and each side of the debate can cite ample legislative history to support its view. Given the Privacy Act's broad goal of making government records available to the individuals about which those records pertain, the CRS may have the better of the argument. However, disclosure of the identities of peer reviewers may greatly reduce their candor and thereby undermine the peer review process.<sup>286</sup> Congress should therefore amend the Privacy Act to provide that discretionary grants subject to peer review are "contracts" within the meaning of the contracts exemption to the disclosure requirements of the Act.

### 3. ADDITIONAL FEEDBACK

Granting agencies that rely upon the peer review model should go beyond the minimum requirements of FACA and the Privacy Act to adopt NIH's practice of preparing detailed one-page summary statements of panel evaluations on a routine basis, whether or not an applicant requests this information. Although this requires some additional staff time, it should not be excessively burdensome. Agency staff no doubt assemble some documentation of panel deliberations in any event. Reducing those notes to a one page explanation should not add greatly to the staff time already devoted to the process. In addition, granting agencies should make any written evaluations prepared by the peer reviewers and minutes of any peer review panel meetings available to applicants who request them.

Although not explicitly required by the Privacy Act, agencies could record and prepare transcripts of advisory committee meetings and make redacted versions of them available to applicants. However, many granting agencies administer dozens of peer review committees, and are hard-pressed merely to prepare minutes of panel meetings. A requirement that meetings be recorded and transcripts prepared would

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282. Memorandum to House Government Operations Subcommittee on Information, Justice and Agriculture from American Law Division, Congressional Research Service (Jan. 4, 1990).

283. Memorandum to Erich Bloch, Director from Lawrence Rudolph (undated).

284. *Id.*

285. *Id.*

286. *See infra* text accompanying notes 295-302.

probably discourage candor to some extent and would definitely add greatly to the expense of the peer review process. On the other hand, some agencies, like NEA, for reasons of their own, routinely record peer review meetings. To the extent that an agency prepares transcripts, they should make them available to applicants with information revealing identities of particular speakers suitably redacted. However, the tape recordings themselves should not be made available to applicants, because they would no doubt allow an applicant to attribute particular comments to particular individuals.<sup>287</sup> Rather, the recordings should be transcribed.

#### 4. A MORE EFFECTIVE OPPORTUNITY TO REBUT

The Privacy Act gives persons about whom an agency keeps records the right to demand corrections of records that are inaccurate, irrelevant, incomplete or untimely. Depending upon the timing of the attempted correction, this provision could provide an avenue for applicants to submit rebuttals to inaccurate statements in the documents that the agency makes available as feedback.<sup>288</sup> Yet, agency practice with respect to providing rebuttal opportunities varies widely. Of the agencies studied here, only NIH provides an opportunity for the applicant to rebut any errors manifested in the evaluations prior to the final funding decision, and even that process is not especially effective. The Privacy Act requirements apply only to records that the agency retains long enough to be available to a requesting applicant. Documents that the agency discards at the end of peer review committee meetings are generally not available for rebuttal. For example, EPA's Privacy Act regulations give applicants an opportunity to submit corrections to documents contained in their files, but the staff removes the most important documents before the applicant can gain practical access to them.

The granting agencies should follow NIH's practice of making summary statements ("pink sheets" in NIH parlance) available to applicants sufficiently in advance of a final decision to allow correction of inaccuracies by the applicants and to have those corrections considered by the agency staff.<sup>289</sup> In addition, the agencies should retain any written evaluations of peer reviewers, minutes of committee meetings and any transcripts of committee meetings in the applicants' files for a sufficient length of time (normally less than one month) for the applicant to obtain copies and rebut information contained therein. While this may increase the number of document requests and attempted rebuttals from the current minimal level, it should not bog down the process, because the

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287. See *infra* text accompanying notes 295-302.

288. According to Rustrum Roy, the Dutch government allows rebuttal prior to funding. Roy, *supra* note 172, at 327.

289. See CHUBIN & HACKETT, *supra* note 4, at 203-04 ("Principal investigators . . . should be allowed to write a rejoinder to their reviews before the award . . .").

agency need consider only factual rebuttals (not disputes about the merits of the evaluations).<sup>290</sup> Finally, the existing NIH process could be improved by allowing applicants to submit written rebuttals to the peer reviewers themselves, rather than to a reviewing entity (like the NIH Advisory Councils) that usually approves the peer reviewers' recommendations on a pro forma basis. Like motions for rehearing in court, the rebuttals could be circulated to members of the study sections by mail. This would provide a realistic opportunity to affect the decisionmaking outcome without consuming too much reviewer time.<sup>291</sup> A second meeting of the reviewers would not be required, except in cases in which the reviewers believe that a serious error has been made that would affect the outcome of the process. Any additional meeting could be accomplished by conference telephone call.<sup>292</sup>

##### 5. ACHIEVING CONSISTENCY THROUGH RULEMAKING

To a large extent, the wide variation among the granting agencies with respect to feedback and rebuttal stems from the failure of the granting agencies to articulate substantive criteria and guidelines for

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290. NSF took the position in response to the Kalb petition that an opportunity for rebuttal would be too burdensome. But it should be no more burdensome than the process that has already been effectively implemented at NIH. One former NSF program officer suggested that comparing NIH to NSF is inappropriate, because individual program officers in NSF have much higher workloads than their equivalents in NIH. Redfield Interview, *supra* note 65. While it is true that NSF program officers are overworked, sometimes handling as many as 200 actions per year, they are generally available for questions and requests for status reports from applicants and potential applicants. The additional burden of the few rejected applicants that are likely to take advantage of the rebuttal opportunity should not be excessive. If the additional burden is too great, the answer may lie in reducing the workload on the program officers, rather than running a system that is perceived to be unfair. The NIH experience suggests that rebuttals are extremely rare and therefore do not consume many staff resources. Indeed, NSF's implementation of a formal reconsideration process in response to the Kalb petition did not generate the predicted "wave of reconsideration requests." Memorandum to Members of the National Science Board from Walter E. Massey, Director, re: Annual Report on the NSF Proposal Review System (Apr. 24, 1991) Attachment I, at 3; *see also* Memorandum to Members of the National Science Board from Walter E. Massey, Director, re: FY 1991 Annual Report on the NSF Proposal Review System (Mar 1992) Attachment I, at 2.

291. A recent book on peer review by Chubin and Hackett suggests that NSF implement a less adversarial "dialogue" model:

Principal investigators and authors should be allowed to write a rejoinder to their reviews before the award or publication decision . . . . We hope peer review can become a dialogue, a collective decision with somewhat less of the adversarial tone it now has.

CHUBIN & HACKETT, *supra* note 4, at 203.

292. Since the conference call meeting would be a meeting of an Advisory Committee, it would have to be announced in advance. Since it would be considering an individual application, however, the meeting could be closed to the applicant and the public. Thus, the meeting could be accomplished by a conference call in which only members of the peer review committee would be invited to attend.

implementing their FOIA, FACA, and Privacy Act obligations. In some agencies (e.g., NEA), the agency's practice varies from program to program depending upon the particular Director's attitudes about the value of sharing information concerning the content of panel meetings with rejected applicants. Such wide variations across programs within a single agency on issues as basic as the agency's Privacy Act obligations are difficult to justify. On the other hand, agencies need not confine the information that they make available to rejected applicants to the bare minimum required by the Privacy Act.

The granting agencies should determine in advance and in some detail the kinds of information that they will normally make available to rejected applicants and to the public, and they should adhere to those determinations in all of the agency's programs in the absence of compelling reasons for departing from them. The best vehicle for crafting agency policy on information disclosure is an informal rulemaking proceeding. The agency could publish a proposed rule containing a detailed description of the information that will normally be available to applicants and to the public and specifying procedural vehicles for obtaining that information. An agency could by rule make some information (e.g., scores, anonymous evaluations or staff summaries of peer evaluations) available automatically in its letter notifying applicants of the outcome; other information might be made available only upon receipt of a specific request and only to someone authorized to receive it. The agency could even create an appeals process under which an applicant or member of the public could demand more information upon a showing of good cause.

## D. Anonymity

### 1. APPLICANT ANONYMITY

An obvious first-level shield against favoritism and animus would be a requirement that agencies not reveal to reviewers the applicant's name and institutional home.<sup>293</sup> Like "blind grading," applicant anonymity would make it difficult to reward friends or damage enemies. It would also eliminate the "halo effect" that results in unmeritorious applications receiving funds on the basis of the reputation of the principal investigator. Finally, blind evaluations could increase the chances for funding of meritorious applications from mavericks.

The granting agencies in NIH, NSF and EPA do not attempt to shield the identities of applicants from reviewers. Agency staffers interviewed for this article were generally opposed to the idea, arguing

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293. The following analysis addresses only the extent to which government-retained peer reviewers should be aware of the identity of applicants. It does not address the broader question whether the identities of applicants should be made available to the general public, a question that invokes the interplay between the Privacy Act and FOIA.

that the applicant's experience or "track record" was an important aspect of the evaluation. In addition, reviewers who are aware of the identities of applicants can uncover plagiarism or stolen ideas on the part of applicants.<sup>294</sup> In programs that manage a small number of very large grants, applicant anonymity is impractical, and it is, of course, impossible to do an anonymous site visit.

Although the arguments against applicant anonymity are generally persuasive, there may be contexts in which an applicant's past track record is less important than his or her immediate potential and for which practical considerations do not preclude anonymity. For example, peer review panels for some NEA music programs typically rely upon tapes of applicants' performances in which the identities of the performers are not revealed until after all of the tapes have been evaluated and compared. Because it enhances objectivity and contributes to the fairness of the grants process, agencies should attempt to identify stages in the deliberative process for which applicant anonymity is feasible and take steps to achieve blind grading where it is appropriate.

## 2. REVIEWER ANONYMITY

Many observers of the peer review process have suggested that the identity of peer reviewers should be a matter of public record. Otherwise, biased reviewers can hide behind the cloak of anonymity and thereby avoid accountability to applicants and the general public for their evaluations. Opponents of reviewer anonymity argue that reviewers who make career-shaping decisions about the scientific quality or artistic excellence of grant proposals should be willing to defend their evaluations forthrightly to those whose lives their judgments directly affect.<sup>295</sup> Others argue that shielding the identity of peer reviewers promotes hypocrisy in professional relationships.<sup>296</sup>

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294. On two or three occasions instances of plagiarism have been detected in this way in the Biotic Systems and Resources Program. These cases were referred to NSF's Inspector General. Telephone interview with Mr. Victor Westbrook, Grants Officer for Biological, Behavioral and Social Sciences, NSF (Nov. 2, 1990)

295. Opponents of reviewer anonymity at the 1976 House subcommittee hearings on peer review at NSF relied upon the following somewhat defensive arguments:

- (1) Reviewers can be relied upon to be candid and straightforward in their evaluation of a proposal, regardless of whether the system is open or closed. Reviewers who are not willing to defend their positions in an open system ought not to be reviewing Federal grant proposals in any case.
- (2) Openness would result in more responsible and objective reviews. Superficial or personality-based comments would diminish, and the result would be a more focused and effective evaluation.
- (3) Qualified scientists will continue to participate in the interest of furthering the best quality science.
- (4) Confidentiality makes the system unnecessarily difficult to defend from charges of internal bias, old-boy network practices, favoritism, or other

None of the agencies studied in this article reveal to applicants the identities of professionals who conduct detailed reviews of individual proposals. NIH does make available to applicants and the public the names of all of the members of its panels but it does not reveal the identities of primary and secondary panel reviewers. Similarly, the identities of EPA panelists are available to applicants who go to the trouble of attending panel meetings.<sup>297</sup> As a practical matter, it would be difficult in any event to shield the identities of panel members from applicants, because "it is impossible to keep secret the names of members of a standing committee who travel to Washington several times annually."<sup>298</sup> But neither agency reveals to applicants the names of the panelists who individually reviewed their proposals.

Most reviewers strongly support reviewer anonymity.<sup>299</sup> Abandoning reviewer anonymity would almost certainly affect the candor of the evaluations.<sup>300</sup> In a world in which the roles of applicant and reviewer are frequently reversed, a non-anonymous reviewer may not be as truthful in negatively evaluating a project. Even if all reviewers could somehow be absolutely shielded from retaliation, few members of a professional community are anxious to incur the hostility of a colleague by making sharply critical evaluations, even when warranted. As with non-anonymous faculty evaluations of students in job or professional school applications, the reader of the non-anonymous peer review would have to keep a keen eye open for the slightest indication that the writer was subtly damning the subject with faint praise. It is simple human nature not to speak candidly when the subject of the conversation is in the same room.<sup>301</sup>

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criticisms. That is, an open system can better demonstrate its impartiality and effectiveness.

- (5) An open system would increase the workload of program officers in some ways and reduce it in others. In any event, staffing levels can be adjusted to the new workload.
- (6) Openness means change and change may cause some problems initially; but, in the long run, the system will recalibrate and stronger reviews will result. The new system will stand public scrutiny, and science will achieve a higher level of credibility.

HOUSE COMMITTEE REPORT ON NSF PEER REVIEW, *supra* note 4, at 44-45; *see also* CHUBIN & HACKETT, *supra* note 4, at 205.

296. *See* Chubin, *supra* note 213, at 75.

297. NSF also makes its lists of potential reviewers available to the public. These lists are generally so long that it is impossible to guess the identities of individual reviewers. HOUSE COMMITTEE REPORT ON NSF PEER REVIEW, *supra* note 4, at 46.

298. *Id.* at 46.

299. Only 27% of the respondents in a survey of NCI applicants preferred eliminating reviewer anonymity, while 61% opposed it and 12% were undecided. CHUBIN & HACKETT, *supra* note 4, at 78.

300. *See, e.g.,* Voelker v. Federal Bureau of Investigation, 638 F. Supp. 571 (E.D. Mo. 1986) (stressing the need for confidentiality in outside evaluations for purposes of government employment); Mervin v. Bonfanti, 410 F.Supp. 1205 (D.D.C. 1976) (same).

301. HOUSE COMMITTEE REPORT ON NSF PEER REVIEW, *supra* note 4, at 45-46.

As we have seen, the FOIA does not require agencies to reveal the identities of reviewers, because they are protected by the internal deliberations exemption to that Act's disclosure requirement. Reviewer anonymity is more difficult to protect under the FACA, because the identities of panel members must be revealed when the committees are chartered and when they meet in open session. However, the identities of the applications that a particular panel considers need not be publicized if the committee is free to go into "executive session" to consider individual applications. Although peer review committees in all of the agencies studied here do in fact go into executive session to consider individual applications, this is only permissible if an open meeting would otherwise reveal information "of a personal nature where disclosure would constitute a clearly unwarranted invasion of personal privacy," a topic discussed above. Similarly, whether the Privacy Act allows agencies to shield the identities of reviewers from applicants (as opposed to the general public) depends upon whether the document revealing that information constitutes "investigatory material compiled solely for the purpose of determining suitability, eligibility, or qualifications for . . . federal contracts . . ." an exemption that was discussed above.

The question of reviewer anonymity under the Privacy Act is utterly unresolved. One side of the debate argues that the contracts exemption from disclosure is equally applicable to grants; the other side argues that grants and contracts are clearly distinguishable. The best way to resolve this impasse is for Congress to amend the act to provide applicant access to all staff-prepared summaries, initial written reviews by peer reviewers, and minutes of peer review committee meetings, but not to the identities of the reviewers.

If reviewer anonymity is a desirable goal, then it should be preserved in fact as well as in principle. In practice, however, some of the programs studied here have suffered serious breaches of confidentiality. One high-level NIH official complained that NIH lacks effective sanctions to back up the proscription against revealing the contents of peer review reports and meetings. The offender can, at most, be removed from the committee and barred from future committees.<sup>302</sup> Since committee membership is hard work, however, this is not necessarily a great penalty, even though committee membership does lend an element of prestige.

Granting agencies should explore stronger sanctions. One NEA official suggested that agencies should send panelists a strongly worded letter informing them of their Privacy Act obligations and of the penalties that may flow from breaches of confidence. An NIH staffer suggested that granting agencies be empowered to administer fines for breaches of

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302. This sanction was invoked on one occasion in NIH when a reviewer overheard another reviewer calling applicants and telling them their priority scores on a pay phone. Telephone interview with Dr. Thor Fjellstedt, Deputy Director, Division of Extramural Research and Training, National Institute for Environmental Health Services, NIH (Aug. 9, 1991).

confidentiality. Since granting agencies are not usually regulatory agencies and do not typically have the authority to invoke civil or criminal penalties, this solution might require statutory amendment. It would also require a procedure within the agency for finding facts and administering the fines. Still another strong sanction that is probably available under current law is to bar offending reviewers from receiving a grant from the granting agency for a period of time, depending on the seriousness of the breach. However, because this penalty may be perceived as too harsh agency staff may be reluctant to invoke it. Since no sanction seems clearly preferable to the others, agencies should determine the proper punishment for breaches of confidentiality on a case-by-case basis.

## E. Composition of Review Committees

Another way to reduce bias in peer review is to regulate who may review particular applications. This largely prophylactic approach is aimed at preventing bias from infecting the process in the first place, rather than revealing bias as it arises. In addition, it can help alleviate fears that too much decisionmaking power has been delegated from publicly accountable agency officials to unaccountable peer reviewers. Several suggestions for adjusting the composition of peer review panels to reduce bias are examined below.

### 1. LIMITED NONRENEWABLE TERMS

One way to prevent "old boy networks" from forming is to provide that each member may only serve for a limited nonrenewable term. For example, an NEA panelist can only be re-appointed for a maximum of three consecutive one-year terms. Forced turnover can help ensure that the committees do not become dominated by particular individuals with the same narrow viewpoints. However, it does not guarantee that the committees will not be dominated by persons wedded to a particular paradigm. In most agencies the staff is responsible for selecting committee members.<sup>303</sup> If the staff "stacks the deck" with persons who know each other and share similar ideas about the relevant issues, the effect on the outcome of the granting process will be fairly predictable. So long as there are plenty of persons with the same viewpoint available among prospective panelists, rapid turnover is not a solution to staff bias.

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303. One exception is EPA, where the staff chooses the chairman of the peer review committee, and the chairman chooses the remaining members. The problem is roughly the same if the staff can choose chairmen who will predictably choose adherents of a particular point of view.

## 2. RANDOM SELECTION FROM A QUALIFIED REVIEWER POOL

The potential for "stacking the deck" could be reduced by requiring the staff to assemble a long list of qualified potential reviewers and selecting actual reviewers for particular proposals or groups of proposals through a random selection process. Although this might give potential applicants a greater degree of comfort that the process is functioning fairly, it would reduce "old boyism" only to the extent that the original pool was not limited to prominent old boys. Random selection of reviewers would prevent the staff from choosing the most knowledgeable reviewers to evaluate particular applications, and the process would present the additional burden of assembling and running a fair random selection process.<sup>304</sup>

## 3. YOUNGSTER PARTICIPATION

Another solution to the "old boy network" problem and to any systematic reluctance of established peer reviewers to fund "youngsters" is to provide that a certain percentage of the membership of any peer review panel must consist of relatively new researchers. In highly competitive programs with chronic funding shortages, the conservative bias of peer review operates to discriminate against less experienced researchers attempting to break into the field. Over time, discouraged youngsters will either shift to other research fields or leave research altogether. In addition to spicing up committees with persons reflecting fresh viewpoints, increasing youngster participation would give younger applicants an opportunity to see the system at work from the inside and perhaps enhance their own chances of securing grants in future competitions.

## 4. LAYPERSON PARTICIPATION

Some observers have suggested that the definition of "peer" should be broadened to include professionals from neighboring fields and even laypersons with no special knowledge about the subject matter.<sup>305</sup> The tendency of granting agencies to choose peers from a very narrow pool limits the number of available reviewers and consequently concentrates the workload on the shoulders of a relatively small number of experts. In addition, it exacerbates the tunnel vision problem and facilitates the formation of old-boy networks. It also provides the potential for research and even financial conflict of interest, because a narrowly drawn pool of

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304. HOUSE COMMITTEE REPORT ON NSF PEER REVIEW, *supra* note 4, at 36.

305. According to one prominent scientist, "[t]he scientific merit of a field can be judged better from the vantage point of the scientific fields in which it is embedded than from the point of view of the field itself." Alvin M. Weinberg, *Criteria for Scientific Choice*, 1 MINERVA 159-71 (1963), at 164-65 (quoting Dr. John Von Neumann); *see also* Roy, *supra* note 229, at 24; Donald Martin Reynolds, *Fund Art for the Community's Sake*, NEWSDAY, Nov. 6, 1990, at 45.

peers will invariably include some potential competitors of most of the applicants. A requirement that laypersons and professionals from related fields serve on panels should hinder any staff efforts to "stack the deck" with adherents to particular scientific or artistic points of view, because their attitudes would be less easily ascertainable in advance.<sup>306</sup> In addition, lay participants could occasionally lend a perspective that enhances the quality of the scientific review. Finally, in very specialized fields, limiting panels to recognized professionals risks rendering the process unaccountable to the public that ultimately provides the funds. Built on the premise that funding decisions are too important to be left entirely to the scientists and artists in the field in which the research is funded,<sup>307</sup> an institutional vehicle for incorporating lay members may be a necessary quid pro quo for continued funding of science and the arts on a large scale by government.<sup>308</sup> In fact, Congress thought so highly of the concept of lay participation on peer review panels that it wrote into the 1990 amendments to NEA's statute a requirement that each NEA peer review panel "include representation of lay individuals who are knowledgeable about the arts but who are not engaged in the arts as a profession and are not members of either artists' organizations or arts organizations."<sup>309</sup>

Other than the inconvenience to the laypersons, the primary objection to lay participation on peer review committees is the fear that they will lack sufficient expertise to evaluate proposals properly. A lay person without training in the relevant field, it is argued, cannot possibly understand the strengths and weaknesses of any given application, much less measure one against the other.<sup>310</sup> However, there are several

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306. This observation is more accurate in the sciences than in the arts. Sometimes lay persons have fairly well-defined views about artistic issues that are easily ascertained in advance. For example, it would be fairly easy for a staff concerned about outside criticism and congressional pressure to reduce the probability of funding erotic art by appointing a lay person to the relevant panel whose views on erotic art were well known. Lay persons generally have less well-defined ideas about highly esoteric scientific issues.

307. Professor Karen Mulcahy testified to the Independent Commission on the National Endowment for the Arts that:

It's like saying war is too important a public policy to leave to the generals.

To say public culture should be decided on by artists is like saying Pentagon policy should be turned over to defense contractors.

Paracini, *supra* note 186.

308. Former NEA Chairman, John Frohnmayer consistently advocated lay representation on NEA peer panels, but by "lay" he apparently meant persons highly educated in the arts who did not obtain their livelihood from their art. See Barbara Gamarekian, *Arts Nominee Speaks Out Against Helms Amendment*, N.Y. TIMES, Sept. 23, 1989, at sec. 1, p. 9.

309. 20 U.S.C. § 959(c)(2) (1988 & Supp. 1992).

310. At least two NIH staffers interviewed for this project argued that there should be no public members on peer review committees, arguing that lay participants hinder the quality of the scientific debate. Some professionals in the arts similarly maintain that "knowledge, experience, talent, and interest make the opinions of experts more valuable than those of the layperson. When speaking of art, "the silly cliché . . . but I know what I

persuasive responses to this objection. First, it is incumbent upon applicants for public support to write proposals clearly enough that educated lay persons can understand them. Second, with the help of the other panelists, an intelligent and interested lay person should become sufficiently educated about the critical issues that are on the cutting edge of a field of research. Third, it is not critical that the layperson understand all of the intricacies and nuances in order to gain a sense for the integrity with which the other panelists are applying the broad criteria to individual proposals, and this may be a sufficient role for a layperson in highly technical fields. Fourth, lay representatives are currently being successfully used in many highly technical regulatory agency advisory committees, such as FDA drug review panels and EPA science advisory committees, despite their lack of relevant expertise. Perhaps the most important lesson of NEA's public policy fiascoes of the early 1990s is that public support can quickly vanish when funding decisions devolve to a small group of people who define a field of scientific or artistic endeavor, articulate the criteria for evaluating performance in that field, and deem themselves the exclusive arbiters of excellence.<sup>311</sup>

##### 5. SIZE OF COMMITTEES

To shield against animus and against the sort of research conflict of interest in which a panel member attempts to downgrade proposals of competitors, committee sizes should be expanded. The more that a panelist's "blackball" vote is diluted by other votes that are purely on the merits, the less effect that vote will have on the overall rankings. Thus, committees in NIH with more than twenty-five members and committees in EPA with up to 60 members experience very little blackballing. Indeed, short of a conspiracy, blackballing is virtually impossible in such large committees.

However, large committees are very expensive to assemble and maintain. Travel costs alone can be quite substantial for a large

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like,' is an unacceptable excuse for prejudice and ignorance." Bveb Salzer, *Politiions Need Maturity, Tolerance and Strength in Nurturing Art*, LA TIMES, July 24, 1988, at B2.

311. Referring to complaints about the provision in the 1990 amendments that required lay participation on NEA peer review panels, an editorial in the Chicago Tribune asked:

Could it be that the arts community is upset because it senses that it has lost the franchise on "aesthetic authority"? For 25 years, the NEA's "peer-review" system allowed the arts community to impose an increasingly ingrown notion of "aesthetic authority." Not incidentally, it also has been able to divvy up the government kitty among its favorites, often in disregard of elementary principles of conflict of interest, public taste and, some cynics would say, artistic merit.

Editorial, CHICAGO TRIBUNE, Dec. 4, 1990, at 22; see also Margaret Spillane, *The Culture of Narcissism: Performance Artist Karen Finley and the National Endowment for the Arts*, 251 NATION 737 (1990) (complaining that the artists' "specialized class-bound notion of Those Who Know What Art Is—and those who get to make and judge that art—persistently undermines confidence in the popular creative spirit").

committee, especially if it is required to meet as many as three times per year. Large committees can also be difficult to manage, and they are generally less efficient. Unless personal animus on the part of panel members is a particularly pressing issue (e.g., a field dominated by two warring camps), the added expense of expanding the size of the committee may not be justified. However, in highly competitive programs in which the agency awards only a few very large grants the additional expense of assembling large committees may be warranted.

#### 6. NUMBER OF COMMITTEES

Another way to shield the peer review process from animus and favoritism is to conduct a multi-tier review in which more than a single committee has responsibility for evaluating each proposal. Many peer review granting agencies have a high-level advisory committee made up of prominent people who look over the results of the original peer review committees and have the power to change the results (or recommend that the agency change the results). The Advisory Councils at NIH and the National Advisory Council on the Arts are two examples. However, this second tier review is usually quite superficial and rarely delves into the merits of individual proposals. Although they have many important functions, high-level review panels do not have the capacity to ferret out and eliminate bias.

The multi-tier process in NSF's Science and Technology Research Centers Program offers a good model for programs that make a few large grants. In that process, the agency initially distributes a proposal to outside mail reviewers and then to a six-member peer review committee for the purpose of culling the applications down to a manageable group of thirty applications. It then assembles additional experts into site visit teams that visit the thirty sites and report back to still another "external peer review committee" that examines all of the information available on the thirty institutions in two separate groups. After each group reevaluates the results of the other group, the full external peer review committee identifies the fifteen or so applications that it recommends for funding. While this extremely thorough system effectively shields the decisionmaking process from animus and favoritism, it is exceedingly resource-intensive, and it would not generally be justified for programs that award a large number of small grants. The very last step, however, is relatively inexpensive, and might be useful even for very large programs. The prospect of having a second subcommittee examine the results of the first subcommittee's evaluations should caution panelists against attempting to blackball proposals.

## F. Conflict of Interest

### 1. FINANCIAL CONFLICT OF INTEREST

The granting agencies are by and large sensitive to the problem of financial conflict of interest, and they generally prohibit a reviewer from participating in the evaluation of his or her own proposal or a proposal from his or her own institution.<sup>312</sup> NIH and NSF regulations allow a person to sit on a panel that reviews an application from that person's own institution,<sup>313</sup> but require that person to be absent from the discussions of the institution's application. A virtually identical provision in NEA's regulations received strong criticism on the ground that the financial conflict still existed even though the affected panelist was absent.<sup>314</sup> As with NEA, there should be a sufficient number of qualified reviewers available to evaluate a scientific panel's applications without drawing on persons from institutions with applications pending before that panel.<sup>315</sup> Agencies should generally refuse to allow a reviewer to sit on a panel that will review an application from the potential reviewer's own institution. Even if the financial conflict of interest is severely attenuated, the potential for favoritism is high enough to warrant the additional effort of securing the services of an unaffiliated reviewer.

### 2. RESEARCH CONFLICT OF INTEREST

The agencies have generally failed to pay sufficient attention to the problem of research conflict of interest. The conflict of interest regulations of only one of the agencies studied in this article addressed the possibility that a reviewer would use his or her position to decrease the probability of success of applications from competing scientists.<sup>316</sup> Only one agency dealt with the possibility that reviewers might use

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312. The prototype recusal requirements are those of NIH, which exclude from study sections applicants, family of applicants and their co-workers both at their institutions and at other institutions. In addition, a panelist must leave the meeting when the panel is considering an application from his or her own organization or an organization with which he is negotiating for future employment.

313. Since NSF reviewers meet as panels much less frequently than NIH reviewers, this issue does not arise in NSF as often as it does in NIH. The problem does arise, however, in the Science and Technology Centers Program and is dealt with by dividing the large panel of thirty or so panelists into two groups and ensuring that no panelist sit in the group that performs the first review of the applications from that panelist's institution.

314. See *supra* text accompanying notes 197-203.

315. This may require that some attention be paid to the definition of "same institution." For example, if the University of California, Penn State University, or the State Universities of New York could conceivably be viewed as a single institution this recommendation could be troublesome. A better starting point for a definition of "institution" would be a single campus of a single university.

316. NIH's conflict of interest regulations suggest that a reviewer "should not participate in the review of an application from a scientist with whom the reviewer has had long-standing differences which could reasonably be viewed as affecting objectivity." NIH MANUAL 4510, *supra* note 24, at 7.

information gleaned from the peer review process to their own financial or research advantage. Some agency officials opined that, like plagiarism, research conflict of interest would be classified as scientific misconduct and therefore subject to sanctions such as removal from peer review committees or debarment from the grant process.

The research conflict of interest problem can best be addressed through amendments to agency conflict of interest regulations. The most effective solution is to prevent a reviewer from evaluating any application of a rival researcher or rival institution in a competition for a pool of funds from which he or his institution is competing. Considerable criticism in the press led Congress to amend NEA's statute to adopt this solution, and it does not appear to have unduly hampered the peer review process at that agency. This prophylactic solution is likewise feasible in many scientific research funding programs. If scientists conducting unrelated research are qualified to evaluate proposals in the particular field and if they are willing to devote their time to evaluating research in fields not directly related to their own research interests, then a ban may be appropriate. In some programs, however, this constraint may unduly limit the supply of qualified and willing reviewers. For example, in NSF's Science and Technology Centers Program, where virtually every major research institution in the country either has or is applying for a grant, it is difficult to find qualified scientists for mail reviews who are not associated with a competing institution. Thus, it may not always be feasible to bar persons with potential research conflicts of interest from peer review committees, even though these are the persons who can most effectively blackball rivals and expropriate novel ideas contained in research proposals.

Still another potential solution is to promulgate a general rule prohibiting reviewers from using information and ideas gained in peer review committees in their own research absent the written consent of the applicant. Any applicant who believed that his ideas were appropriated could lodge a complaint with the funding agency. If, after a hearing, the claim was proved to be valid, the agency could suspend further funding of the offender's research or condition the removal of the suspension on some more appropriate penalty, such as a public retraction and apology.

The primary cure for research conflict of interest lies in the professional integrity of the researchers who sit on the committees and the willingness of other scientists to look unfavorably upon the abuse of the peer review process to appropriate the ideas of others. The Director of an important NSF program observed:

As to conflicts of research interests, this is something you really can't legislate. If you try to define it and write it down, people will use it as a crutch. Just like Keating in the S & L scandal—if you write down a rule, then people use it as a reason to get by and play games, saying you said this, but you didn't say this. They will play games

with the interpretation of the rule. You just can't legislate morality.<sup>317</sup>

Yet there is currently no explicit prohibition of the practice and no remedy for the damage done by this abuse of the peer review process in the conflict of interest regulations of most funding agencies. Indeed, it is even possible that some scientists view this access to the ideas of others as appropriate compensation for the time spent reviewing proposals.<sup>318</sup> The agencies should assign a high priority to amending their conflict of interest regulations to address research conflict of interest. Especially in the scientific agencies, where the potential for monetary gain through expropriation of ideas is growing dramatically, the agencies should move rapidly to remove this potential for bias from the peer review process.

### 3. APPLICANT VETOES

One fairly inexpensive way to enhance the perception of fairness in the peer review process is to allow an applicant to request the exclusion of one or more researchers from the list of peers available to evaluate his or her work. Allowing an applicant to veto one or two potential panelists should help reassure rejected applicants that they were not blackballed for personal or idiosyncratic reasons. It may also increase the comfort level of applicants (especially in programs in which for-profit institutions are competing for funds) that reviewers will not expropriate their ideas.

Several agencies provide for applicant vetoes in one form or another. Although NIH regulations do not give applicants the right to object to particular persons, agency staffers often attempt informally to accommodate applicant concerns about potentially biased reviewers. The typical project grant program in NSF allows two forms of challenges. First, applicants may review the Program's list of potential reviewers and request that his or her proposal not be sent to specific persons on that list.<sup>319</sup> If the applicant provides good reasons for the request, the Program Officer usually honors it. Second, after a rejected applicant reads the comments of the reviewers, he or she may request that a particular reviewer not be allowed to review his or her applications in the future. NEA does not currently let applicants review lists of potential panelists to identify persons with a potential bias. Although EPA does not provide for applicant vetoes, the staff invites panelists at the first of every meeting to identify proposals from researchers about whom the panelists have strong negative views. Of course, this opportunity is rarely invoked, as it depends entirely upon the candor of the panelists in identifying any animus that they might harbor toward particular applicants.

The primary disadvantage of applicant vetoes is that they deplete the supply of potential reviewers. In very narrow fields, the only

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317. Harris Interview, *supra* note 221.

318. See CHUBIN & HACKETT, *supra* note 4, at 205.

319. NATIONAL SCIENCE FOUNDATION, GRANTS FOR RESEARCH AND EDUCATION IN SCIENCE AND ENGINEERING—AN APPLICATION GUIDE (Aug. 1990).

technically qualified reviewers may be potential competitors or existing rivals. In addition, in some fields, applicant vetoes may allow applicants "to influence the review of their proposals by challenging the most competent and incisive reviewers."<sup>320</sup> However, the agency could discourage such attempts to "game the system" by limiting the number of vetoes and by requiring challengers to provide adequate reasons for their challenges. Appropriate reasons could, for example, include animus or financial or research conflict of interest. However, lack of qualifications should generally not be a sufficient reason for a veto. The agency staff is in the best position to determine who is qualified to review an application.

### G. Lobbying Peer Reviewers

One of the most significant advantages of the peer review model is that it discourages lobbying and influence-peddling. The professionals and laypersons who participate in the peer review process have a pre-defined source of information (the grant application) that is meant to constitute the exclusive decisionmaking "record" upon which the rankings are based. No additional information is necessary or desirable. The adjudicatory model's strict prohibition on *ex parte* contacts seems entirely appropriate in the granting agencies that rely upon peer review.

Lobbying upper-level advisory committees and upper level agency staff is an inappropriate technique for securing discretionary grants and should therefore be prohibited. At the very least, all attempts to sway peer reviewers and agency staff outside the formal confines of proposal submittal and review should be noted in writing by the object of the lobbying efforts. Contact between lower-level agency staff (e.g. Program Directors in NIH) and applicants should be encouraged, but direct importuning of peer reviewers and upper-level staff with the power to accept or reject the recommendations of peer reviewers should not be allowed.

### H. The Role of Agency Staff

Perhaps the best shield against animus and favoritism on the part of peer reviewers is vigilance on the part of the agency staff serving the peer review committees. Staffers who attend peer review panel meetings see the expressions on the faces of the reviewers as they make what may be sarcastic or *ad hominum* comments. A staff member can also tell when a panelist has crossed the line between advocacy on the merits and favoritism for an "old boy" or hallowed researcher. Agency staffers are also generally more inclined to view mavericks with a sympathetic eye.<sup>321</sup>

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320. Papetti Interview, *supra* note 112.

321. In general, an agency staffer has invested less of his or her career in pursuit of research related to a particular paradigm. The staffer's personal prestige is not at risk if

If the staffer has the de facto power to discount votes that he or she believes are biased, the objectivity of the system is enhanced.

However, it may be expecting too much of a busy staffer to draw such fine distinctions. Most staffers have training in the subject matter that the panel addresses, not in psychology or politics. Empowering the staff to reverse or discount panelist votes may simply invite the staffer to second guess the experts on the merits or to express his or her own biases. Once the agency has decided to draft rules or guidelines on bias and conflict of interest, however, the staff can play a very important role in ensuring that peer reviewers are well-educated about them and that they strictly observe them.

In some of the agencies studied in connection with this Article, the agency staffer has a great deal of influence on the ultimate success or failure of the application, while in others the staffer's influence is marginal. For example, in NIH, the Scientific Review Administrator is supposed to be a silent observer of peer review meetings, speaking only when spoken to, and he or she plays only a limited role at Advisory Council meetings and in the upper-level decisionmaking process. The NSF Program Officer, on the other hand, is responsible for ranking the proposals and making the initial recommendations whether or not to fund, and the outside mail reviewers are merely advisors to the Program Officer. One former NSF peer reviewer, who is now a staffer responsible for grants in another agency, reported that it is not uncommon for the NSF Program Officer subtly to suggest to the outside reviewers how they might view the proposals. Many interviewees noted particularly the powerful position occupied by the NSF Program Officers. Agency staffers with biases of their own can distort the peer review process so that it does not result in funding the most scientifically meritorious proposals.

One relatively easily implemented device for shielding the process from staff bias is to rotate the staff periodically to ensure that no single staffer establishes his or her own "barony" and thereby influences the course that research takes in an entire field. Although this would deprive the system of the expertise that the staffer might acquire over the years in a single program, that disadvantage might easily be outweighed by the advantage of interjecting fresh blood into the system.

## I. Auditing the Peer Review Process

The openness in the peer review grants process inspired by the Privacy Act, the Freedom of Information Act and the Federal Advisory Committee Act should help to insulate the process from animus and conflict of interest. Because it relies upon the policing activities of rejected applicants, however, the openness solution to the bias problem may lack efficacy in the context of chronically underfunded programs in

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the paradigm is disproved. Indeed, a staffer's prestige could be considerably enhanced if he or she were responsible for funding paradigm-shifting research.

which unsuccessful applicants who rock the boat are and shunned. In addition, openness by itself does not effectively address favoritism. Even in an open system, the victims of cronyism or the old boys' network are not likely to know that less meritorious proposals have been elevated over theirs for irrelevant reasons. Most rejected applicants will at most focus on the comments and review summaries that the agencies provide to them about their own applications. They are not likely to examine the entire proceedings to see if the process has been systematically or individually biased toward a particular person or methodological approach.

One well-known technique for spotting decisionmaking tainted by inappropriate or irrelevant considerations is the audit process, under which outside auditors selectively examine individual decisions in considerable detail for evidence of bias or other impropriety. The audit idea surfaced during congressional hearings into alleged bias at NSF conducted during the mid-1970s.<sup>322</sup> Although an extensive report by the subcommittee recommended that NSF adopt an internal auditing program, little came of the recommendation for many years.<sup>323</sup> In 1989, NSF implemented a version of the audit idea with its "Committee of Visitors" program under which each Directorate must appoint a committee of outsiders every three years to review the peer review process in operation. The Committee must be "balanced in terms of its views on programmatic issues and in regards to the institutional, geographic and personal characteristics of its members."<sup>324</sup> Each review must address: "(a) the integrity and efficiency of processes used to solicit, review, recommend and document proposal actions; (b) the relationship between award decisions and program goals; and (c) program support of Foundation-wide initiatives."<sup>325</sup> Although the reviews are generally positive,<sup>326</sup> these systematic "audits" have the potential to detect instances

322. HOUSE COMMITTEE REPORT ON NSF PEER REVIEW, *supra* note 4.

323. The subcommittee recommended that NSF conduct random audits of the decision processes in NSF for individual grants:

These audits should be performed in sufficient detail to address questions of relations among Foundation staff members, applicants, and reviewers. Members of the auditing staff should not normally have responsibilities in the process of decision-making for individual awards. The audits will not replace any activities of the General Accounting Office or other Congressional arms.

HOUSE COMMITTEE REPORT ON NSF PEER REVIEW, *supra* note 4, at 58.

324. NATIONAL SCIENCE FOUNDATION, MANUAL 1: ADMINISTRATIVE INFORMATION MANUAL (ADM), ch. VIII, § 340 (Jan. 31, 1991 update). At least two members may not be serving on any NSF advisory committee and may not have been applicants to the program under review for at least five years. *Id.*

325. *Id.* at § 350. Other topics that should be addressed where relevant include whether "an adequate number of high quality reviewers with technical competence and freedom from bias" were selected for each proposal and whether the program demonstrated a "balance of awards in terms of subject matter, size versus number of awards, and age, experience and geographic distribution of principal investigators."

of bias in the grantmaking process. The certainty that the records will be audited every three years should also deter bias.

It should be feasible to import the audit concept to scientific decisionmaking in granting agencies that use the peer review model. Agencies like NSF and NIH could either appoint or hire outside auditors to examine randomly selected files, including applications, written comments, telephone logs, conflict of interest statements, and committee meeting audiotapes or transcripts. The auditors would probe the relationships between agency staff and reviewers and between reviewers and applicants for financial and research conflict of interest. The audit would be strictly confidential; the names of reviewers and the contents of the reviews would not be made public. If the examination revealed evidence of bias or impropriety, the auditors could be empowered to interview participants and to write a report stating their conclusions about whether the process operated fairly and in accordance with agency regulations. In those, presumably quite rare, cases in which the audit detected bias, the agency could investigate the matter more vigorously.

The audit idea has several advantages. First, it allows a motivated person or group of persons to conduct an intense review of a limited number of funding decisions without jeopardizing the critical confidentiality of the process. At the same time, the ever-present prospect of an audit should act as a substantial disincentive for reviewers and staff to bend the rules or to invoke improper considerations. If they are conducted by outsiders, the audits could also shield the agencies from charges of whitewashing by congressional committees and the general public. Over time, audits should provide useful evidence of the extent to which bias exists at various granting agencies.<sup>327</sup> If little evidence of bias results from a large number of audits, the agency could gradually eliminate them.

Audits have disadvantages as well. They will require resources that might otherwise be devoted to the pursuit of the agency's primary goals. The prospect of being audited might discourage qualified reviewers from voluntarily participating in the process. And it is always possible that an overly zealous auditor will erroneously find bias in a process in which it did not exist, thereby disrupting the process for a time. Despite its expense, it may be possible to implement the audit idea on an experimental basis. If it proves too expensive, it could be abandoned with little loss in time or energy. If it proves successful, it could inspire renewed confidence in the peer review process.

## J. Conclusion

Despite its flaws, the peer review system is still the best model for making exceedingly complex decisions about how to allocate limited

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326. Interview with Mr. James McCullough, Program Evaluation Staff Director, National Science Foundation (Apr. 3, 1992).

327. HOUSE COMMITTEE REPORT ON NSF PEER REVIEW, *supra* note 4, at 40-41.

collective resources to the arts and sciences. One need only examine the output of NIH, NSF, EPA and NEA to conclude that the peer review model has produced marvelous results. Yet, there is room for improvement. The changes advocated here do not go to the heart of the peer review system. If the granting agencies do not implement them, the peer review system will continue to function reasonably well. Yet there is little reason to remain satisfied with flaws in the system if they can be reduced or eliminated at little cost. With some modest improvements, the peer review model that has evolved in this country should provide an example to the world of how a democracy can employ expertise in the service of artistic and scientific excellence.

