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4. The Statutory Framework for Basic Research

Published by

Goldberg, Steven.

Culture Clash: Law and Science in America.

NYU Press, 1994.

Project MUSE. <https://muse.jhu.edu/book/15796>.



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The Statutory Framework for Basic Research

As we have seen, Congress possesses the constitutional power to fund scientific research. But Congress lacks the institutional capability to make the day-to-day decisions concerning who gets that funding. There are simply too many such decisions and they involve too much expertise. Thus Congress has passed statutes delegating its science funding power to administrative agencies. For example, when Congress created the National Science Foundation,¹ it said the agency should “support basic scientific research” and have the work done by those “qualified by training and experience to achieve the results desired.”² Similarly broad language was used to set forth the science funding job of agencies like the Department of Defense, the National Institutes of Health, and the Department of Energy.³

Delegation to Agencies of Funding Decisions

In practice, Congress allocates billions of dollars a year for basic science with the condition that the recipient agencies use the money for research in broadly defined fields. Obviously, the agency itself answers the tough questions in evaluating individual requests for funding: What specific areas of research are most promising? What kinds of qualifications should matter most in making a grant? Thus the difficult decisions on funding are made by full-time agency employees and the outside consultants they retain to evaluate grant and contract applications. The classic

method used is a competitive peer review system in which experts evaluate and compare funding requests, and then choose the winners.

The Supreme Court has provided important support for the central role of the agencies by holding that only actual congressional legislation, as opposed to comments found in the legislative history, bind an agency to a particular spending program.⁴ Thus a single member's desire to fund a particular science project, expressed, for example at a hearing, is not binding. According to the Court's 1993 decision in *Lincoln v. Vigil*, "the very point of a lump-sum appropriation [by Congress] is to give an agency the capacity to adapt to changing circumstances and meet its statutory responsibilities in what it sees as the most effective or desirable way."⁵

Of course, agency officials will often, as a matter of prudence, heed concerns expressed by members of Congress in hearings, or advice given in a committee report as to how money ought to be spent, even though these inputs are not legally binding. But even these relatively easy forms of guidance are rarely forthcoming in the highly technical field of research funding.

Indeed, agency control over science funding is so well established that deviations from the pattern attract considerable attention. When, in 1984, some universities seeking science funding attempted to follow a different route, the *Washington Post* trumpeted in a front-page headline, "Colleges Bypass Agencies to Get Federal Funds."⁶ What shady process had these schools engaged in? According to the article, the schools had sought funds "directly from Congress without going through the usual, laborious route of applying to federal agencies."⁷ The notion that the democratically elected Congress would pass legislation setting specific research priorities is generally regarded as "pork-barrel politics"⁸ or inappropriate "earmarking"⁹ that should not be allowed to subvert the expert review taking place in the permanent bureaucracy.

The continuing controversy over the "earmarking" of scientific research funds is instructive. Beginning in the early 1980s, Congress occasionally passed laws requiring an agency to fund a particular scientific project, usually one involving building a facility at a specific university.¹⁰ Prominent examples included the Soybean Laboratory at the University of Illinois-Urbana and the Waste Management Center at the University of New Orleans.¹¹ Members of Congress at times justify this practice by saying they want to spread out research money so that it does not all go

to the same elite institutions, the notion being that good science takes place in many places. In practice, of course, earmarking has tended to favor the constituencies of powerful members rather than any neutral geographic pattern.¹²

In any event, earmarking has received almost universal condemnation. "Basic and applied research," the newspapers say, "should be determined by peer and merit review, not congressional favoritism."¹³ The President's Council of Science Advisors says that earmarking "must cease and must not be initiated or encouraged by universities."¹⁴ One scholar sees in "porkbarrel science" the "corruption of our research enterprise."¹⁵

One might surmise from this that science funding has been taken over by the great unwashed. In reality, earmarking, even taking the highest estimates and assuming that none of it is done in good faith, accounts for under 1 percent of the federal government's spending on research and development.¹⁶ Vastly more "porkbarrel" spending takes place in countless nonscience areas throughout the U.S. budget.¹⁷

What is derided as "porkbarrel" is, through another lens, democracy. When representatives spend the taxpayers' money there are at least elections to take them to task. The system is far from perfect, but, outside the realm of science spending, it is at least understood that voters choose people who vote on spending programs. But science is different—here the presumption is that an elite group, the science community itself, decides how to slice up its own portion of the federal pie.

This presumption reflects our belief that science should not be governed by interest group politics. There really is "good" and "bad" science and, even allowing for hard cases, it is safer to have scientists decide which is which. Of course, bureaucracies develop their own pet projects that would not be part of an ideal research program, but it is in fact true that expert agencies are better able to manage incremental decisions in this field than are elected officials. Neither the president nor members of Congress want earmarking to replace peer review as the norm in American science funding.

At this point, constitutional purists might object that, however substantively attractive peer review is, under this approach nonelected officials are making key government decisions, an approach the Constitu-

tion does not appear to envision. But this sort of broad delegation of congressional power to administrative agencies is hardly limited to science funding. In many areas of government regulation, such as communications and environmental protection, agencies actually do the day-to-day work. Judicial construction of the Constitution requires only that Congress provide "adequate standards" to guide agencies, and broad language such as "regulate in the public interest" has been found adequate—indeed, not since the 1930s has the Supreme Court found any congressional delegation unconstitutional.¹⁸ Although the Court might revive nondelegation doctrine someday, it will almost surely not be in the area of science funding, where virtually no one believes that Congress or the president can provide meaningfully detailed guidance on technical decisions. Even when modern justices have raised questions about delegations to agencies, they have noted that Congress can delegate if it chooses a general policy and leaves implementation to an agency when a "field is sufficiently technical, the ground to be covered sufficiently large, and the Members of Congress themselves not necessarily expert."¹⁹ Thus delegation in the science funding area has not been seriously questioned.

This is not simply a twentieth-century phenomenon. In the science area, high political officials have never been able to spend their time making detailed judgments. Even Thomas Jefferson fell victim to this reality. As Secretary of State Jefferson personally examined patent applications. But in passing on those applications, Jefferson sought and received advice from professors at the University of Pennsylvania. Moreover, Jefferson himself complained that the job was so difficult that it gave him "from time to time the most poignant mortification" because he was "obliged to give undue and uninformed opinions on rights often valuable, and always deemed so by the authors." After just two years of Jefferson's labors, the patent law was revised to require that the Department of State issue patents automatically if fees were properly paid. Thus the burden of determining the validity of patents fell on the courts. By 1836, Congress passed a new law creating a permanent office of commissioner of patents with a professional staff capable of assessing patent applications.²⁰ Given the difficulties even Jefferson faced, it is hardly surprising that today science policy of all types is made initially in the federal bureaucracy.

The Absence of a Department of Science

As a consequence of this approach there is no unified federal program for science spending. Various agencies—including the Departments of Defense and Energy, the National Aeronautics and Space Administration, and the National Institutes of Health—fund basic research in areas important to their mission. The National Science Foundation, which funds basic research in a variety of areas, countervails to some extent the practical orientation of the other agencies. But there is no “Department of Science.” And, despite efforts in the White House and on Capitol Hill to get an overview of science spending, there is no single “science policy” for the United States.²¹

different ways of supporting research by using full-time government laboratories, as is common. Often, however, the agency supports research through grants or contracts. A grant is used for open-ended research that may have no precise specifications set in

the difference between a grant and a contract. First of all, when an agency awards a grant, it has certain obligations. The agency has certain obligations and it supports those grant obligations. Secondly, research contracts are not typically open-ended. They are not typically used for advertising, which includes the receipt of sealed bids, and they are not used for the most suitable. After all, an agency does not set precise specifications and it does not use a system of “negotiated procurement” in which a general agency solicits interested parties before the

like the National Institutes of Health, the National Aeronautics and Space Administration, and the Department of Energy from historical practice

Moreover, the different agencies have different ways of supporting research. They can do the research themselves, they can use government employees or government-run national laboratories, or they can work with the Departments of Defense and Energy. Some agencies fund research by private parties, either through grants or contracts. In theory, a grant is given for relatively open-ended research that may provide information of use to the government. A contract is awarded for work done to meet more precise specifications set in advance by the procuring agency.

In practice, however, there is often little difference between a grant and a contract in the area of scientific research. When an agency awards a grant, it is not making a general statement about broad goals it hopes will be accomplished, and it does not solicit requests that seem likely to achieve those goals. When a contract is awarded, it is not like contracts to buy nuts and bolts. It is entered into through the process of formal advertising, including the publication of detailed specifications, receipt of sealed bids, and award to the bidder who is lowest or otherwise most suitable. With basic research, it would not be possible to use a system of “negotiated procurement” in which a general agency solicits interested parties before the award of a contract. Accordingly, agencies more often use a system of “negotiated procurement” in which a general agency solicits interested parties before the award of a contract is awarded.²²

In reality, the preference of some agencies for grants (like the National Institutes of Health) for grants, and some (like the National Aeronautics and Space Administration) for contracts, stems from

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than from any substantive difference in the kind of work done.²³ The central fact is that, whether through grant or contract, federal government support of scientific research by private parties is a remarkably ubiquitous aspect of American science. And like so many other areas of American science, it is conducted on an agency-by-agency basis.

None of this is meant to suggest that administrative agencies are wholly autonomous, but they are undeniably the central actors in science funding decisions. To a considerable extent the rest of the executive branch, as well as Congress, reacts to what an agency requests. Bureaucratic power is always important in budget making, but it is particularly so where, as here, it is married to a high level of technical expertise. Moreover, scientists within an agency can often count on support on budgetary issues from scientists in outside groups because of shared beliefs in professional norms.²⁴

Limits on Executive and Legislative Control of Agencies

Under the circumstances, executive and legislative control of the agencies is limited. At the White House level, the small Office of Science and Technology policy can advise the president on major science policy issues, but it can hardly manage in detail the funding decisions made by the large mission agencies such as Defense, Health and Human Services, or Energy. The president's science advisor (as the head of this office is known) can, for example, provide input when the effectiveness of a major weapons system becomes a matter of public controversy, but that is a different matter than the ordinary grant and contract decisions made daily in the bureaucracy. The Office of Management and Budget can more vigorously enforce overall spending limits in science as in other fields, but even it cannot scrutinize in every case the key questions concerning precisely who gets the research dollars.

The president's most important effect on the day-to-day conduct of science policy stems from the power to appoint the heads of agencies and their key subordinates. These policymakers work closely with the full-time research establishment and can acquire considerable knowledge about at least some program areas.²⁵ At the subcabinet level, below most public scrutiny, appointees share authority with civil service scientists who have come up through the ranks.²⁶

When Congress considers science spending it faces similar limits.

Because there is no single Department of Science, there is no single science budget. The various agency requests go to numerous committees and subcommittees, hampering the development of an overall policy. The problem is not, as is sometimes supposed, a lack of access to technical information. Congress can and does obtain studies on specific issues from such groups as the National Academy of Science, the Congressional Research Service of the Library of Congress, the Comptroller General, and the Office of Technology Assessment, among others. But these studies tend to be limited to relatively high profile public issues, such as the utility of sending astronauts into space, rather than to the disposition of grant requests.

The president and Congress, of course, cherish science for different reasons than do scientists. The political forces care more about a payoff in practical devices and less about the growth of knowledge per se. Thus, science is rarely immune from budget cutting in hard times, and it is never immune from persistent requests to justify itself in practical terms. A large program concentrated in a single agency, such as the superconducting supercollider, can be ended unceremoniously. But generally money is provided in the broad areas where practical results are most likely, and basic scientists are then allowed to work.

There is even an important sense in which the goals of our elected political officials reinforce the norms of the research community. Politicians have an understandable desire for a scientific "breakthrough." It seems to promise imminent real-world benefits and thus justify the taxpayers' money that has been spent on research. Thus politicians will favor a line of scientific research that will lead to a dramatic scientific result, and leave for later the possibility that the technological payoff is less than ideal. A line of research that will not lead to rapid scientific progress will be of less interest, at least initially, even if its longer term social prospects are admirable. Scientists may, as Snow wrote, "have the future in their bones,"²⁷ but for legislators the future is now.²⁸

The media further reinforce this tendency. News stories tend to focus on dramatic breakthroughs rather than day-to-day research.²⁹ As Walter Lippman wrote, "[T]he news does not tell you how the seed is germinating in the ground, but it may tell you when the first sprout breaks through the surface."³⁰

Thus in the basic research area, the scientists' goal of scientific progress is supported, albeit for other reasons, by political and media forces.

Indeed, scientists themselves are sometimes more cautious about whether a result is a "breakthrough" than are politicians or reporters. But our society's major built-in source of deep caution—the process norms of the lawyer—is not well represented at this stage.

The main risk in this system from the scientists' point of view, at least so long as reasonable funding levels are maintained, is undue pressure for immediate results intruding on sound scientific judgment. Thus political efforts to wage a "war on cancer" in the 1970s led to wasteful spending on projects with political but relatively little scientific appeal. Fortunately, they also led to a backlash in which more meaningful basic research on cancer came into fashion and more practical progress came to be made.³¹

A similar flare-up once marked congressional attitudes toward military research and development. In 1970, spurred in part by the belief that the Department of Defense had been spending too much money on research not directed toward military applications, Congress passed the Mansfield Amendment to the Military Procurement Act.³² The amendment provided that no research could be undertaken by the Department of Defense unless it had "a direct and apparent relationship to a specific military function or operation."³³ The amendment was not a success. First, it had little impact, as Defense Department officials were adept at pointing to previously nonobvious implications of research funded by the department. Secondly, the amendment was soundly attacked on the ground that, if taken seriously, it would hinder valuable research because good basic science often cannot be shown to have a "direct relationship" to a particular end. In the 1971 procurement bill the amendment was diluted to provide that research must have "a potential relationship to a military function or operation."³⁴ Through it all, basic research continued in the Defense Department.³⁵

Thus, basic science operates free of the day-to-day political constraints common elsewhere in American society. Of course it hardly seems that way to the harried science administrator, confronted with budget pressure from the Office of Management and Budget, facing potential ridicule in the form of a "Golden Fleece" award for research that seems silly, and trying to satisfy or appease the desire for results from everyone in elected office. But these judgments are relative. A single change in Social Security requirements, a single desegregation plan in a local school district, indeed, a single proposed change in postal rates can

provoke political and legal frenzies that can make an entire science program seem like a backwater.

All of this could change in either of two ways: if the United States had a single Department of Science, or if the president were given a line item veto. Either change would probably work against the interests of the basic research community.

In theory, a single Department of Science could develop a coherent science policy. Thus there have been many proposals for such a department throughout American history.³⁶ They have never been enacted, in part because of opposition from those agencies already engaged in science spending. But even if we could write on a clean slate there are two major drawbacks to a Department of Science.

First, putting all science spending in one basket would subject that spending to wide fluctuations. In good times, science might receive quite a boost, but basic research would be in trouble when budget-cutting is rampant. Under the present system basic science is insulated to some extent from budgetary battles because areas like health, energy, and defense are rarely cut all at once, and all of those areas contain substantial basic research programs. Science is spread out across the federal bureaucracy, which makes it a difficult target. Of course, a rational public policy analyst could argue that basic science does not need or deserve any exemption from the type of scrutiny that would accompany creation of a single science budget, particularly given the popularity of science across the political spectrum. But the uncertain and long-term nature of basic research makes it preferable to protect science somewhat from sharp changes in budgetary policy.

The second danger with a Department of Science is more fundamental. As we have seen, under our Constitution, government has the power to fund science in a way that would be very troublesome in areas such as religion or politics. If it chose, for example, the federal government could fund only those cancer researchers who believe cancer is caused by a virus. Those with different theories would be free to publish their views and seek private funding, but in practice they would be at an enormous disadvantage. This approach is unconstitutional in other areas: the federal government could not fund the Catholic Church, and it could not fund the Democratic Party to the exclusion of all other parties. The nature of the scientific endeavor inevitably involves a type of picking and choosing that would cause problems elsewhere. We simply are not

willing to fund all individuals who call themselves scientists—judgments on the merits must be made.

But such judgments ought to be made cautiously and with a sense of humility. A single Department of Science might tend to support a single line of basic research, and that would be disastrous if that line proved mistaken. Progress in science is so difficult to predict that a variety of approaches is usually needed in the early days of working on a scientific problem, long before any technology is in sight. A Department of Science could even come under the spell of a political theory that dictates a research path, thus leading to a disaster like Lysenkoism in the former Soviet Union, which hampered the development of biology for years. More likely, but equally dangerous, would be a Department of Science that took a monolithic approach to a problem because it rejected the alternatives on scientific grounds that turned out to be mistaken. As a result, it is a blessing that so many agencies fund scientific research under so many overlapping and inconsistent guidelines that an "American science policy" is hard to discern. Just as the Italians say that the inefficiency of their bureaucracy is the safeguard of their liberty, so too the absence of a Department of Science is a safeguard of free scientific inquiry.

Similarly, the line item veto is a possible reform of the budget process that might bode ill for science. Apart from its overall merits, this tactic could have a negative impact on science spending.

Under present law, the president of the United States can only veto a bill in its entirety; the president lacks authority to veto part of a bill while signing the rest into law. By contrast, the constitutions of forty-three states give governors the item veto, that is, the power to veto parts of certain bills. This power is usually limited to appropriations bills and thus the item veto is seen as a budget-balancing device.³⁷

Although doubts about its constitutionality at the federal level have been raised, a variety of liberal and conservative lawmakers have called for giving the president statutory item veto authority so that he could slice "porkbarrel" projects out of massive appropriations bills.³⁸ From the point of view of science spending, there is a problem because, although the American public supports science as a general proposition, individual research projects are easy for politicians to ridicule. Former Sen. William Proxmire's "Golden Fleece" awards for wasteful government spending often went to relatively inexpensive science projects. For

example, in "honoring" a study of aggression in primates, Proxmire focused on the scientist's interest in when the animals clench their jaws:

The funding of this nonsense makes me almost angry enough to scream and kick or even clench my jaw. It seems to me it is outrageous.

Dr. Hutchinson's studies should make the taxpayers as well as his monkeys grind their teeth. In fact, the good doctor has made a fortune from his monkeys and in the process made a monkey out of the American taxpayer.

It is time for the Federal Government to get out of this "monkey business." In view of the transparent worthlessness of Hutchinson's study of jaw-grinding and biting by angry or hard-drinking monkeys, it is time we put a stop to the bite Hutchinson and the bureaucrats who fund him have been taking of the taxpayer.³⁹

In fact, studies of primate aggression could have beneficial medical implications for humans. But it is sometimes easier to make fun of the studies than to understand them. In the hands of a politically minded president, any number of science projects could be subject to similar ridicule. Fortunately for the science community, the item veto does not presently seem likely to become a reality.

The Virtual Absence of Judicial Review

Given the absence of a Department of Science or a line item veto, the primary engine of basic science for the present and the foreseeable future is the administrative agency, limited only occasionally by Congress and the president. The question then becomes the role of the courts. In this situation, which arises throughout American life in areas ranging from social welfare to the regulation of health and safety, there is a standard legal approach that defines the nature of judicial control of agencies. The relevant area of the law is called administrative law, and it is familiar to attorneys as one of the most ubiquitous and important branches of our legal system. It is typically here that the cautious process values of the legal profession come into play. Yet as we review the basic ideas of administrative law as they apply to science funding, we will see that such funding receives unusually favorable treatment in the courts.

Pursuant to a variety of statutes, most importantly the Administrative Procedure Act of 1946, agencies must follow certain procedures in making their decisions and must be able rationally to justify the results they reach. To enforce these rules, an agency decision is almost always

reviewable in court. Whereas the availability and nature of judicial review is set forth in broad terms by statute, in practice the courts themselves determine in large measure how vigorously they will review agency action. When an agency's decision is challenged, the court will first decide whether it should reach the merits of the complaining party's case. That party must satisfy a number of preliminary doctrines, such as standing and ripeness, designed to assure that the case is being brought by a proper person at a proper time.

If the court does reach the merits it will not hold a trial; that is, it will not replicate the fact-finding work of the agency. Instead the court will see if the agency followed proper procedures and if its decision was within reasonable bounds. On the latter point the court will defer to an agency decision even if it might have come out the other way. The court will step in on a substantive matter only when the agency's decision is so poorly explained or so unpersuasive as to appear irrational. In such cases the court will typically send the case back to the agency with the requirement that the agency either change its decision or provide a better justification for its initial result.⁴⁰

This sort of judicial review is the bread and butter of administrative law. It is entirely consistent with the procedural emphasis that permeates so much of American law. A court does not decide if every agency decision is right or wrong. There are thousands of agency rulings every day, many of which involve technical complexities that would test the resources of any decision maker. A judge, moreover, is a generalist who operates with no staff beyond a secretary and a couple of law clerks right out of law school. Under the circumstances, the preliminary doctrines of administrative law, such as standing, enable the court to select those cases most appropriate for judicial review. If the merits of a complaint are reached, the court focuses on the quality of the process used and the adequacy of the explanation given by the agency—areas where a generalist is the best decision maker.

But it would be a serious mistake to confuse procedurally oriented review with punchless review. Courts have shaped the work of modern federal agencies in areas ranging from ratemaking to communications to energy and the environment precisely by forcing agencies to conform to essentially procedural norms.⁴¹ Of course it would be a myth to suggest that the judges who play this role are utterly neutral on the merits of the agency decisions before them. Being human, they are more likely to look

closely at a decision they would have made differently. But those instincts are limited by their professional roles and by their resources. The result has been that courts have become the primary external control over agency behavior. Under the circumstances, we must look to judicial review of agency decisions to fund scientific research in order to understand the relationship between law and basic science.

Potentially, the courts could play an active role in policing science funding decisions. The Supreme Court's decision in *Lincoln v. Vigil*, noted earlier, only insulates from review an agency's decision on allocating resources when neither Congress nor the agency has created standards to be met by applicants for funding. In the science funding area such standards are set forth by the agencies' own rules and practices as they seek to evaluate the thousands of funding requests they receive. Yet when we look at science funding we do not see the ordinary give and take between courts and agencies that marks American administrative law. We see instead abdication by the courts of any control over agency decisions.

We must look closely at the cases that establish this agency dominance in order to understand how extraordinary it is and to appreciate its implications for the overall relationship between law and science. The most important of these cases concern disappointed applicants for research grants.

The starting point in understanding these decisions is an appreciation of peer review—the dominant approach agencies such as the National Institutes of Health and the National Science Foundation use in deciding who receives grant money.

Peer review involves a grant application being sent to a group of leading scientists in the relevant field. These scientists give their views as to whether the application should be granted. The reviewers typically take into account not only the research proposal itself but the scientific reputation of the person seeking the grant and the quality of the institution with which the applicant is affiliated. Thus a well-known scientist from a major university is treated more favorably than an unknown from a minor school.⁴²

There are many variations in the peer review system. Some agencies utilize outside experts more than others, some utilize more than one layer of review, in some a favorable peer review makes the award of

the grant almost certain, whereas in others additional factors, such as conformance with an immediate agency mission, play a bigger role.⁴³ Moreover, peer review is not without its critics. The system has at times failed to detect fraud, and it has hardly been foolproof in terms of locating the most worthwhile projects.⁴⁴ But peer review remains unchallenged as the dominant way in which decisions are made concerning the funding of basic science, just as it is the dominant method for deciding what articles will be published in scientific journals.⁴⁵ Indeed, if anything, the pressure today is to extend peer review even further. Proposals have been made to subject the projects of the national laboratories, such as Los Alamos, to peer review,⁴⁶ and to use peer review more extensively in areas relating to the impact of technology.⁴⁷

From a legal perspective, certain features of peer review are particularly striking. There is no adversary process—no one appears before the panel to press the applicant's claim or to oppose it. And there is a willingness, even an eagerness, to take into account the personal stature of the applicant—a factor that would be troubling in many settings. But peer review is a perfect fit for the scientific world view; indeed peer review has been called "a mirror of science."⁴⁸ It is the embodiment of the scientific community governing itself. Scientists say what is good and what is bad science. They are not perfectly objective. They are not perfectly accurate. But they are the ones making the decisions. This consensus-based approach is not workable when the basic norms of science are violated; when, for example, it became necessary to adjudicate claims of fraud, more traditional judicial models came into play at the research agencies.⁴⁹ But when the question is the usual one of what is promising research, the decisions are made in a nonadversarial setting by the scientific community. And when those decisions are challenged in court, the research agencies who are being sued argue vigorously and successfully that outsiders should stay on the outside.

The logical starting point for examining judicial review of scientific research is with Dr. Harold Kletschka, who brought the first modern judicial challenge to a grant decision.⁵⁰ In 1959, Kletschka began work at the Syracuse Veterans Administration Hospital and at the nearby Upstate Medical Center, a New York state medical school. By 1961, he had obtained from the Veterans Administration (VA) a \$20,000 grant for research into development of a plastic artificial heart. Before he could

use the grant he was called to military service. When he returned in 1962, the VA refused to restore his grant and transferred him to another hospital. Kletschka claimed these events were due to the spreading of malicious and slanderous statements by some of his colleagues at Syracuse. He brought a lawsuit against a variety of defendants, including the VA, claiming that a conspiracy had deprived him of his rights, including his right to the research grant. The defendants responded, in part, that their actions were based on the quality of Kletschka's work.⁵¹

The district court that initially heard the case did not reach the merits of the doctor's claims. The court found some of the defendants immune from suit and found, as to other defendants, that even if Kletschka's allegations were true they did not entitle him to judicial relief.⁵² On appeal, the U.S. Court of Appeals for the Second Circuit stated explicitly why it would not review the VA decision on Kletschka's grant. The court invoked an infrequently used provision of the Administrative Procedure Act that exempts from review agency action "committed to agency discretion by law."⁵³ The use of that provision was appropriate, according to the Second Circuit, because of the nature of scientific research:

It would not be feasible for the courts to review decisions by the V.A. awarding or refusing to award research grants. Each such decision involves a determination by the agency with respect to the relative merits of the many proposed research projects for which funds are sought. This determination requires considerable expertise in the scientific, medical, and technical aspects of each application. A reviewing court would have to master considerable technical data before it could even attempt to determine whether one application, Dr. Kletschka's for example, was so superior to the others that its rejection by the V.A. was an abuse of discretion. Furthermore, even if these technical aspects were mastered it would be difficult for the court to review the judgments of relative personal competence which necessarily play a role in the agency determination.⁵⁴

The Court was not moved even by the fact that Kletschka's grant had been removed after he was summoned to military service, because the doctor's initial 1961 grant "might have been unjustified in 1962 because of intervening advances in heart research."⁵⁵ Keep in mind that the court is not rejecting Kletschka's conspiracy theory; it is saying that even if false and malicious statements cost him his grant, his is not the kind of case a court should review.

If slander does not give rise to a cause of action, perhaps discrimina-

tion does. That, at least, may have been the thinking of Dr. Julia Apter who, in 1972, challenged the denial of a research grant on the ground that the denial was based on her gender and her political views.⁵⁶ The dispute arose when, in 1971, the Rush-Presbyterian-St. Luke's Medical Center, where Apter was a professor, applied to the National Institutes of Health (NIH) for a grant to train students in biomaterials research. Apter would have been the program director responsible for administering the grant. While the application was pending before an NIH committee, she testified before a Senate subcommittee concerning alleged conflicts of interest on the part of some of the NIH committee members. When NIH denied the grant application, Apter brought suit claiming the denial was because a woman had been designated as program director, because she had participated in feminist activities, and in retaliation for her testimony.⁵⁷ The trial court threw her case out without reaching the merits on the ground that she lacked standing because the actual applicant for the grant was not Apter but the Rush-Presbyterian-St. Luke's Medical Center, which had not sued. The court reasoned that because the center was unwilling to challenge the grant denial, the court "should not be in the position of foisting the program on it."⁵⁸

On appeal, the U.S. Court of Appeals for the Seventh Circuit reversed, concluding that the alleged violation of Apter's First Amendment right to testify and her alleged personal economic injury in losing the opportunity to be program director were sufficient to give her standing.⁵⁹ The appellate court did not, however, decide in her favor. It simply sent the case back to the trial court for further proceedings. Moreover, the appellate court's decision stressed that the trial court should keep in mind that the NIH has broad discretion in the funding of training programs.⁶⁰ The appellate court cited Kletschka's case and emphasized that the trial court should confine itself to looking for violations of an express constitutional or statutory guarantee.⁶¹ Not surprisingly, Apter was unsuccessful when the case went back to the trial court.⁶²

With allegations of slander and discrimination having failed, the next lawsuit directly challenged the scientific wisdom of an agency decision.⁶³ Dr. Davide Grassetti had often received federal grant support in the areas of chemistry, pharmacology, and cancer. In 1975, however, the NIH turned down his request for research money to study a chemical compound, carboxypyridine disulphide, which he claimed could impede the spread of existing cancer. The agency believed, among other things,

that the lack of detail in Grasseti's application was "indicative of a lack of appreciation . . . for biomedical and pharmacological studies."⁶⁴ When Grasseti went to court, claiming in part that the agency's decision was unjustified on the facts, he received a cold reception indeed.

First the court, citing Kletschka and Apter, said it was "probable that the medical merits of agency decisions on research grant applications are committed to the unreviewable discretion of the agency."⁶⁵ The ordinary administrative law inquiry into whether the agency decision had been adequately justified would not be undertaken. Only the presence of a direct violation of constitutional, procedural, or statutory guarantees could even be considered. The court admitted that "unfortunate as it might be, it is a fact of life that courts are simply not competent to step into the role of a medical research scientist faced with having to evaluate an applicant's technical expertise."⁶⁶ Moreover, the court went on to say that even if something resembling judicial review were to be followed, the agency would win because it adequately demonstrated the reasonableness of its decision.⁶⁷ Unsurprisingly, this decision was not appealed.

The next case directly challenging a research funding decision was brought not by a disappointed applicant, but by a relatively disinterested party.⁶⁸ In 1978, Roslyn Marinoff brought suit against the Department of Health, Education, and Welfare (now Health and Human Services), the agency that oversees the NIH. Marinoff sought to compel the agency to investigate whether a particular chemical could serve as a cure for cancer.⁶⁹ Not only did she lose, but the court, in a familiar refrain, never reached the merits of her case; that is, it never decided whether the agency had reasonably explained why it would not investigate the chemical in question. Instead, the court deployed a few of the many preliminary doctrines available in cases of this type. It noted first that Marinoff's complaint, because it sought to order an agency to take action, was seeking, in effect, a writ of mandamus, a rarely granted form of relief. The court found that the writ was unavailable here because, although the agency had a general duty to undertake cancer research, Congress has "left to the agency's discretion the choice as to what substances purported to cure cancer warrant extensive research."⁷⁰ A moment's reflection makes clear the import of the court's statement: because Congress left it up to the agency, the court should leave it up to

the agency. Thus, there can be no doubt about where the power has been delegated. Continuing in the same vein, the court went on to hold that even if Marinoff's complaint were viewed not as seeking a writ of mandamus but simply as seeking judicial review of an agency decision not to proceed, the suit must fail because, in light of the *Kletschka* and *Grassetti* cases, such decisions are "committed to agency discretion" and not subject to judicial review.⁷¹

A 1993 effort to challenge the government's AIDS research effort fared no better. Kazmer Ujvarosy sought to persuade the National Institutes of Health to investigate a particular theory concerning AIDS; when they denied his request, he went to court.⁷² The judge dismissed his claim, finding that Ujvarosy lacked standing and that, in any event, the matter was committed to agency discretion, both doctrines meaning that the court would not even look at the merits of the claim.⁷³

This litany of cases provides reasonably precise guidance as to how courts will respond to complaints about science funding decisions: they will respond negatively. In cases spanning from the 1950s to the 1990s, challengers to the government have been unsuccessful. During this period, judicial review of agency action in other fields has gone through phases of relative vigor and relative calm—there have been eras of "hard look" review and of substantial deference⁷⁴—but the judicial reluctance to second guess science funding decisions has remained constant. There is, of course, the possible loophole—the court's occasional insistence that direct agency violation of constitutional, procedural, or statutory directives will lead to reversal—but such cases simply have not arisen. Scientists and the lawyers they consult know that the odds of success are low. So although a case could be imagined in which the scientist would win—a grant openly denied on the basis of race or gender, for example—in practice, judicial review in this area has not been a successful way of challenging agency action.

The situation is similar if an individual protests her failure to receive a contract as opposed to a grant. As discussed previously, in the research area there is often little difference between contracts and grants. That similarity extends to the difficulty of overturning an agency decision. Theoretically, someone who is turned down for a contract to do research work can protest to the Comptroller General of the United States or to the courts.⁷⁵ In practice, if the protest is based on the argument that the

agency wrongly evaluated the technical merits of a proposal, the chances of reversal are low.⁷⁶

The Privileged Legal Status of Science

At this point, those unfamiliar with administrative law may be decidedly unsurprised at the result of the cases discussed. After all, it might be argued that a research grant or contract is a privilege and not a right, and it involves technical considerations beyond the competence of judges. These arguments, however, do not go very far toward explaining the judicial abstinence in this field. The right versus privilege notion could be invoked to justify unreviewable government discretion in virtually every phase of modern life. Do you have a right to a sidewalk in front of your house? If not, does that mean the government could omit your sidewalk while providing one for your neighbors without any explanation? And if the sidewalk is a mere privilege, could the government provide you with one only if you promise never to criticize the government while walking on that sidewalk? It does not take long to see the danger of an expansive notion of privilege.

To move closer to the science funding example, consider a truck driver's license. It could, presumably, be described as a privilege—the state could have decided that trucks, which are involved in thousands of deaths a year, are to be banned altogether. Having decided not to ban trucks, the state could decide that it will limit, on a completely arbitrary basis, who will have the privilege of driving them. In fact, however, society, including the judicial system, thinks of truck driver's licenses in a somewhat different way. The state sets standards concerning who shall qualify for a license. If you meet those standards you are entitled to that license—you have a right to it. If the motor vehicle administration denies you the license, you can go to court and the court will determine if the agency had proper grounds for denying the license.

Science funding might be viewed the same way. Suppose the NIH announces that funds are available for worthwhile projects in cancer research. You believe your proposal is more worthwhile than any other the agency has received. You would understandably believe, under those circumstances, that you have a right to a grant. If you do not get one and you argue, for example, that inferior projects were funded because of a personal vendetta against you, you would expect a court to make

the NIH explain itself. You do not want the judges to be scientists, but only to assure that scientists are doing their job. You would be furious if the court declined to even look at the merits of your case.

The surprising nature of the judicial abdication in the science funding field can perhaps best be seen by examining a comparable area of administrative law. The Social Security Administration deals with millions of requests each year for disability payments. But whereas disappointed researchers seeking science funding almost never win in court, approximately 10,000–25,000 disappointed disability claimants go to federal court each year, and between one-fifth and one-half of them persuade the courts to reverse the agency's decision.⁷⁷ What is the difference? It cannot be explained solely by the technical nature of science funding decisions. Disability decisions often turn on complex medical judgments made by several physicians, yet the courts step right in. They do not act as doctors, of course, but they do find that the agency has not adequately justified its decisions.

Consider, for example, the case of Shirley Ber, a sewing machine operator in New York City. In 1960, at about the same time that Dr. Harold Kletscka was applying for a grant to develop an artificial heart, Mrs. Ber was applying for disability benefits on the ground that severe pain stemming primarily from an arthritic condition prevented her from working. A hearing examiner in the Department of Health, Education, and Welfare (now Health and Human Services) studied reports from at least six doctors and concluded that Mrs. Ber had a mild case of arthritis, could continue her job, and thus was not entitled to Social Security benefits. Mrs. Ber went to court and her case ultimately reached the U.S. Court of Appeals for the Second Circuit, the same court that would later hear Dr. Kletschka's case. But whereas the court would not consider whether there was a sound basis for removing Dr. Kletschka's grant, they plunged immediately into the medical reports that had been relied upon by the hearing examiner in Mrs. Ber's case. The court found that those reports permitted only one reasonable conclusion—that Mrs. Ber experienced such sharp pain that she could not work as a sewing machine operator.⁷⁸

Or consider long-time U.S. Steel employee William Lashen, who left his job after an accident blinded him in his left eye. Lashen sought disability payments because of his visual problems and because he had difficulties holding objects in his right hand.⁷⁹ The government, citing

conflicting testimony from doctors and an ambiguous report from a vocational expert, denied benefits, finding that there were jobs that Lashen could hold. But in 1993, about the time the courts were rejecting Kazmar Ujvarosy's request for government money to fund research on his AIDS theory, Lashen won a decisive victory when a federal court held that the evidence required that he be granted benefits.⁸⁰

Our concern is not whether the court was right or wrong about Mrs. Ber or Mr. Lashen. The question is why they were treated so differently from Dr. Kletschka and Mr. Ujvarosy, that is, why judicial review is so much more searching in disability cases than in the science funding area. You should not assume that the judicial role in Social Security has been uniformly praised. It has, in fact, been the subject of lively debate, with some contending that the courts contribute little but inefficient and ineffective decisions. Yet the judicial role continues, side by side with judicial abstinence in science funding.⁸¹

The difference cannot be explained by judicial deference to the grinding need of disability claimants. Many of the disability claimants who go to court are middle class; indeed genuinely poor claimants often lack the resources to sue. Moreover, scientists denied government funding are often sympathetic plaintiffs. If unsuccessful, their entire career may be slowed, even halted.

Can it be that the slippery right versus privilege argument explains the disparity? It would be hard to argue that disability payments, a system not even created until 1956, is an absolute "right." A worker's contributions pay only a small part of the payment received. Income is being redistributed under a program the government was not obligated to create. If there is a right, it is the right to receive payments when you meet the agency's standard for disability. Scientists, who pay taxes and who may spend a good deal of money preparing a grant application, will feel that they have an equal "right" to a grant if the application sets forth a deserving project.

With the contrast to disability payments in mind, we can look back over the cases denying review of science funding decisions with a bit more skepticism. The courts in those cases used a variety of doctrines in ruling in favor of the government. They found the agency decisions to be "committed to agency discretion." Judges and lawyers have quarreled over the precise meaning of that phrase, but all have agreed that it applies only to a very narrow area of decisions. Simply as a logical

matter, the fact that an agency is exercising discretion is hardly grounds for judicial abdication. The courts in administrative law cases routinely correct “abuses of discretion.” Indeed, given the broad powers given to modern agencies, judicial deference in the face of “agency discretion” would leave no role for the courts at all.⁸²

In the cases we surveyed, the courts relied as well on doctrines such as standing and the limited nature of mandamus relief. These doctrines too are flexible—they can be applied stringently or leniently depending on the nature of the case. Courts in administrative law cases have many other such doctrines at their disposal. The court will not hear the merits of your case if it is not “ripe,” that is, you have not yet been harmed by agency action fit for judicial review. You cannot sue if you have not “exhausted your remedies” by pursuing available sources of relief within the agency. And so on.

When, as in the science funding area, courts resolve to apply these doctrines rigorously before reaching the merits, supplicants before the courts may feel that they are facing a Kafkesque maze. The adjective is of particular relevance here. Franz Kafka was, in fact, a lawyer who worked in a large social welfare bureaucracy, and he was well aware of the difficulties facing those who sought relief from the Workmen’s Accident Insurance Institute.⁸³ Kafka once remarked, in amazement, “How modest these people are. Instead of storming the institute and smashing the place to bits, they come and plead.”⁸⁴ Kafka’s fiction, of course, conveys a nightmarish vision of the search for justice. But compared to the modern judge bent on avoiding the merits, Kafka was a piker. *The Trial* is a terrifying account, but it relies, from a modern lawyer’s point of view, on rather basic maneuvers, like declining to specify the charge against K. A modern-day *Trial* in an administrative law setting would include demands that the hapless applicant satisfy recondite tests for standing and ripeness before the court would even think about discussing whether the agency has adequately explained the charge. “Before the Law” is perhaps a chilling and prophetic universal nightmare, but a mild one indeed for today’s lawyers. In this segment of *The Trial*, a supplicant seeking entrance to the law waits for years before a gate. Just as he dies, the gatekeeper announces, “[T]his gate was built only for you and now I am going to shut it.” A modern version of “Before the Law” would admit the supplicant through the gate and then dismiss him if he could not prove that he had “exhausted administrative remedies” and

then admit him again only to raise the problem of "mootness," and so on.

But the labyrinthian ways of judicial review, despite their appearance, are not, in functional terms, a meaningless maze. Preliminary doctrines such as "standing" and "commitment to agency discretion" enable judges to shield themselves from a flood of cases by picking and choosing those that are most appropriate for judicial consideration. In the science funding area the courts have chosen, with remarkable unanimity, to employ doctrines effectively closing off judicial review, leaving open the possibility of such review only if extraordinary cases, such as those involving racial discrimination, should arise. The real question is why that course has commended itself to so many judges. This judicial abstinence contrasts, after all, not only with Social Security disability cases, but with judicial involvement throughout American society.

The fundamental reason for this abstinence is that the area of basic scientific research is one of the few in American life in which something approaching consensus still exists. As we have seen, science is in some respects a self-governing republic, with scientists deciding what is and is not good work. Of course these are disagreements, hard cases, and uncertainties. But there is broad enough agreement on fundamental issues that nonscientists will generally defer to scientists on questions concerning basic research.⁸⁵

Here, as before, we must be extremely careful about assertions concerning the "scientific establishment." As we saw earlier, science is established in the sense that it is government supported, but there is no "science establishment" in the rigid hierarchical sense. Not only do numerous agencies fund research under varying guidelines, but even within an agency different perspectives exist. Studies have shown that your chances of getting funding depend in part on the particular scientists who serve on your peer review panel.⁸⁶ And this is as it should be. There are always at least some prestigious scientists willing to look for new and different ideas. But this does not mean that anything goes. If there is no science establishment, there is at least a science community. Scientists as a whole are willing to view some practitioners as marginal or worse and to act accordingly.

The existence of the science community directly constrains the number of lawsuits that will be brought to challenge science funding decisions. Disappointed applicants who bring suit may be reducing their

chances for getting funding in the future. Few people want to be seen as marginal troublemakers when they may have to go back to the same well again. You will recall, for example, that Dr. Judith Apter initially had trouble bringing her lawsuit because the medical center where she worked would not join in her suit. Apter contended, not unreasonably, that the medical center was afraid of losing the opportunity for future grants.

The situation is very different for a disappointed applicant for disability payments who challenges a Social Security Administration decision. There is no coherent community of professional views concerning what is a disability. The medical profession may or may not be able to reach consensus on a given diagnosis for a syndrome, but even if it could the question of what is disabling is too controversial. To many it would seem to be a nonmedical question, but even the addition of vocational experts does not lead to wide consensus. Now to purists, the question of what is a promising scientific research project is not itself a scientific question. But that misses the point—it is a question the scientific community, for better or for worse, is able to deal with in a relatively coherent fashion.

Moreover, scientists seeking funding are members of the very community they are petitioning. By contrast, a disabled worker is not. Indeed, an applicant for disability payments is unlikely to be seeking the same relief from the same people again. Under the circumstances, bringing a lawsuit poses few risks; indeed, it may even nudge the agency in your favor under the adage that the squeaky wheel gets the grease. With science funding, the squeaky wheel may get replaced.

Consider then what courts confront when a challenge to science funding comes before them. There is the normal deference due to an administrative agency that is, after all, a large bureaucracy capable of detailed judgments. There is the esoteric nature of the scientific judgment at issue. And there is, most importantly, a sense that the challenger is not a wronged citizen, but rather an outsider with marginal views challenging a respected community of scientists. It is not surprising that the courts have generally rebuffed such challenges without even reaching the merits of the case.

Thus, from a litigator's point of view, basic science operates in something of a vacuum. Traditional administrative law provides no workable way to challenge decisions of the science community. Thus the favorable

statutory status of science meshes perfectly with its favorable constitutional status. The scientific community itself dominates a system marked by substantial support and freedom for scientists, whereas the legal community finds itself with little power. And, as we shall, one of science's traditional rivals—religion—is also outflanked in American law and culture.