The Abandonment of the Scientific Ethos

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The scientific research community has long held the outward appearance of objectivism and progressivism. The public sees little of the true conservative and political nature of the scientific enterprise, which is willing to abandon its highly esteemed scientific principles and replace them with the pursuit of monetary gain and the achievement of public glory. In the latter half of the twentieth century, scientists have been forgetting their responsibility to truth and public well-being in favor of their own personal gains. Through his forty years as a scientific journalist, Daniel Greenberg tells the troubled story of the modern American scientific enterprise in his book *Science, Money, and Politics*.

First, it is important to know the players in the politics of science. The majority of the scientific population abstains from direct involvement in national politics (aside from casting votes) but still maintains a vital role in the politics within the science community. For this paper, references to scientists will be referring to scientists engaged in basic research—research without direct commercial application—in the so-called "hard sciences," as opposed to the social sciences. The border between the science community and Washington is upheld by several organizations. Congress funds two organizations which in turn fund academic science: the National Science Foundation (NSF) and the National Institutes of Health (NIH). The White House also has its own science advisor in some capacity (the position has changed in status several times over the years) who is in regular communication with scientists. There also exists the National Academy of Sciences, which is not a part of any government agency, but still plays a role in the politics of science.

Apart from agencies such as the NSF and the NIH, the scientific community resides in a realm almost entirely apart from national politics. It has its own political structure which is built to reward those who have high standing and political favor amongst scientists. At the center of the scientific political scene lies the National Academy of Sciences (NAS). Membership into the society is highly exclusive, and to be admitted is the most prestigious honor bestowed upon a scientist, short of the Nobel Prize (p. 262). However, membership is not always determined by excellence. Carl Sagan, renowned amongst the public for making science accessible through his television show *Cosmos*, was a strong contributor to the scientific community with 350 papers (p. 262). He also had numerous appointments to NASA advisory positions and played a role in the deployment of the Mariner, Viking, and Voyager satellites. He was seen by many to be a natural choice for membership into the academy (p. 262–263). One obstacle stood in the way of his ascension into glory: he was politically very different from the existing members. Unlike most accomplished scientists, Sagan held some status as a celebrity. This led to some resentment within the scientific community, hence eliminating Sagan not only from contention for the prize while he was alive, but also from recognition following his death (p. 263). Thus, in the glory-seeking world of science, Sagan's example of scientific excellence combined with public service was not to be mimicked.

In addition to individual biases within the scientific community, favor towards certain institutions is also prevalent. From 1980 to 1995 five universities have consistently ranked in the top ten recipients of government funding (p. 38). These top ten receive 17.9% of all federal R&D money for universities. Furthermore, the elite of academia resist changes to the system which would assist lesser universities in expanding their research. In 1978, the National Science Foundation launched the Experimental Program for the Stimulation of Competitive Research (EPSCoR) with the goal of increasing "the ability of scientists in eligible states to compete successfully for Federal funds." The academic elite resented this program, and its funding has remained limited since its inception (p. 39,101). Over time, America's scientific institutions have established a system where those wealthy in funds and prestige are the primary recipients of funding. Unfortunately, this system is firmly in place and unlikely to budge. As Reagan's White House science advisor remarked, "preserving the status quo has become the overarching goal, replacing the pursuit of excellence." (p. 34)

This structure that creates an aristocracy of academics has in turn grounded the scientific enterprise in conservatism. As a result, the actions of many scientists have run contrary to the goals of science. One clear example comes from an attempt to remedy shortfalls in peer review. In order to improve the "obtuse and creaky" peer review system at the National Institutes of Health, in 1999, the NIH assembled a panel of experts to propose changes which could help the system. However, afraid that the changes would limit funding, many university chemists viciously opposed the findings of the panel and the change was never made (p. 25).

The scientists who are engaged in basic research are contemptuous towards other fields which they find to be of lesser status. One field in particular has been the target of science's superiority complex: engineering. Following the collapse of the Soviet Union, scientists began to question whether the nation would continue to pour money into basic research since one major political reason for doing so had been eliminated. Thus, in the 1992 election campaign, when candidates Bill Clinton and Al Gore stated that "The absence of a coherent technology policy is one of the key reasons why America is trailing some of its major competitors in translating its strength in basic research into commercial success" (p. 375), the scientific research community feared that funding for technology would overrun funding for basic research.

To address the potentially altered role of the NSF in the future, the foundation formed a commission to plan for its next five years. Prior to the commission's creation, the NSF director and the Senate Appropriations Subcommittee for NSF, more conscious of national politics, suggested that more emphasis should be placed on applied research (p. 375–377) The commission, then, contained four members of industry and one politician out of the fifteen total members—a high number for the academia-dominated NSF (p. 377). As deliberations commenced, suggestions came flooding in from science and industry—each biased toward their own self interests (p. 386). Tensions within the commission were high, and its report was released with so many muddled opinions that no single, clear message could be drawn from it (p. 388–389). In order to remedy this problem, NSF staff constructed a preface to the report, and—after several rejected drafts—released what Greenberg calls an "artfully composed two-page manifesto" titled "In Support of Basic Research." (p. 399). The document contained exactly zero references to engineering (p. 401). As a further slight to engineers, a 1996 attempt to change the name of the National Science Foundation to the National Science and Engineering Foundation lost in the House of Representatives—due to prodding from the scientific community—with a vote of 339–58 (p. 34–35).

The primary reason that the scientific community perceives its role as being the top of a hierarchy of knowledge-gatherers is that it clutches to the widely discredited "linear model" of development—that science leads to technology, but not vice-versa (p. 45). This view was championed by Vannevar Bush, whom many in math, physics, and chemistry—the dominant voices in science politics—believe to be the creator of the modern American science establishment. While a seemingly innocuous belief at first, its danger lies in the fact that it is used as the primary reason to press for more funding for science. During the mid-1990s, as the Republican Revolution and promises of budget cuts arose from Congress, scientists cleverly pointed to recent technological successes as attributable to advanced scientific knowledge, despite the fact that some of the most famous of these innovations came from college dropouts (e.g. Bill Gates and Steve Jobs) (p. 73). The linear model went unquestioned and the federal budget for science grew to be larger than ever before (p. 488).

The relationship between science and government has been mutually beneficial—the scientists get endlessly increasing budgets while the Congressional politicians use support of science as a political tool. Left out of this relationship is the general public's interests, which only come as an occasional side effect of scientific progress. A good example of this is Space Station Freedom, backed by NASA under the Reagan Administration. NASA successfully built political and public support for this endeavor, but the lack of progress and repetitiveness of its missions took a toll on its supporters. With the lack of support from the public, NASA's publicists decided to attract more interest in the space station by creating a competition to send a schoolteacher to space. The winner was Christa McAuliffe from New Hampshire. McAuliffe boarded the space shuttle Challenger, which launched on January 28, 1986 and exploded mid-flight. This accident was a clear indication that space exploration was not ready for the public use, yet NASA still followed through with exploiting the public via a publicty stunt that sent a school teacher to her death for the sole reason of obtaining financial and public support (p. 411).

University research is funded largely by the federal government, which provided $15.5 billion in 1998 (p. 81). With so much money involved, some degree of corruption is expected, and science is no exception. Nowhere is this more prevalent than in the use of the “indirect cost” system. Because the process of research can have many unexpected costs, grants typically allocate money towards anything that an university deems is necessary to perform research. These overhead costs include administration, library facilities, utilities, depreciation of research equipment and buildings, and student services. Although all these actions are necessary in order to produce research, universities stretch the definition of indirect costs to include needless expenses such as administrative reorganization and hosting official functions or other social events (p. 85–86). As time progressed, these indirect costs increased and began to take funds away from actual research money. In 1982, James B. Wyngaarden became the director of the NIH. He tried to change the indirect costs system but was only able to create minor adjustments, leaving the system relatively unchanged. In 1972, every dollar of direct research spending had a 30 cent overhead, By 1990, the overhead had increased to 46 cents per dollar (p. 82).

Not all money that scientists acquire comes from grants. Through extensive lobbying, universities have become accomplished in obtaining federal earmarks as well. It is estimated that lobbying from universities has grossed $5.1 billion in earmarks between the years of 1980 to 1996 (p. 184). Compared to the budget for other research-funding organizations, this seems like a trifling amount. However, earmarks bypass one important aspect of the usual scientific grant process: there is no peer review. With the lack of peer review comes a corresponding decline in quality; in fact, it is often the case that earmarks are sought because of a rejection of a proposal from the reviewers (p. 185–186). Furthermore, the earmark system is biased towards the rich, since they have more to spend on lobbying. One particularly displeased president of Boston University, John Silber, pointed out that “There are seven national laboratories that are funded by non-peer review [earmarks] at $2 billion a year at MIT, Caltech, Chicago, California, Columbia, Johns Hopkins, and Harvard.” (p. 189).

Scientists’ dealings with the government are far from the only situations in which they have abandoned their devotion to honesty and integrity. Increasingly, scientists have been enticed by the lure of greater financial gain in corporate work. Nowhere have the ethical failings been more evident than in overly sensational biomedical industry. A clear example of unethical misrepresentation is fluconazole. Fluconazole is an antipsychotic drug manufactured by Pfizer Inc. Pfizer, in collusion with unscrupulous academics, released multiple publications with the same data under different authors to several scientific journals.This makes it difficult for independent researchers to prepare, analyze, and compare the drugs from the different studies via a process called meta-analysis. Even though there were no hidden side effects, the presence of multiple instances of the same data skewed the results of meta-analysis in favor of Pfizer (p. 350).

Scientists hold a unique position in society. They are looked toward by the public to both find and confirm facts. However, with the presence of corruption, they repeatedly abuse their standing. Through the past 50 years, we have seen acts of unethical behavior ranging from simple greed, such as abusing grants, to the endangerment of human life, as displayed by Pfizer Inc. Although actions have been taken to prevent and reduce the occurrences of these misdeeds, it has not been enough to truly cause a permanent change within the scientific system. It is up to the individual scientists to be vigilant in maintaining the true scientific and ethical integrity of the scientific ethos; it is up to politicians to break down the barrier between national politics and the scientific establishment in order to hold science accountable to public interest; and it is up to the citizens to look upon scientific funding with a critical eye and an intolerance of corruption.

References

[1] Greenberg, Daniel. *Science, Money, and Politics: Political Triumph and Ethical Erosion.* The University of Chicago Press, Chicago, 2001.