

Science Is Political, and We Must Deal with It



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The notion of an “apolitical science” is appealing—one might almost say axiomatic—to many scientists. In contrast to the contingency and contextuality of ideas in the humanities or in social and political science—look, for example, at where the intellectual consensus once stood on the virtues of democracy—the “hard” sciences are considered to attain knowledge that is reliable and in some sense “true” no matter what political milieu it arises in. Newton’s laws worked as well in nonrelativistic mechanics in the 17th century as they do today.

The notion that science and politics do not mix is, moreover, seemingly recommended by the example of history, which, as the Viewpoint from Krylov¹ recently pointed out, abounds with cases of political interference in science that have wrought harm and impeded progress. The anti-Darwinian views of Trofim Lysenko during the Stalin regime in the Soviet Union—which caused immense damage not just to Soviet biology but to its agrarian economy—are a particularly notorious instance, as is the opposition to “Jewish science”, such as Einstein’s theories of relativity, in Nazi Germany. The persecution of Galileo by the Catholic church is another familiar example of dogma triumphing over science—although that story is typically reduced to caricature when told by scientists, the real history being far more nuanced.² And oppressive dictatorial regimes have no monopoly on interference with science, as George W. Bush’s administration showed: a US House of Representatives committee found in 2007 that the government had “engaged in a systematic effort to manipulate climate change science”.³ (That incident looks almost benign in comparison to the distortions and obstructions of science by the Trump administration.)

But a well motivated opposition to such state interference in science should not be confused with the canard that science should or can be kept “free from politics”. The scientific endeavor has always been intrinsically entrained with politics, at least since Francis Bacon argued in *Novum Organum* (1620) that scientific knowledge, systematically amassed, could fuel the engine of state power. From nuclear physics to space exploration, research on HIV to Covid-19, biotechnology to climate change, there is no denying that scientific research can have potentially transformative political implications and that politics, economics, and society in general influence the choices that are made in what to fund and study, who owns the knowledge, and how it is used. If Bacon was right that knowledge is power, the pursuit of knowledge can hardly expect to be free from any taint of vested interests, and nor can it ignore questions about which voices hold that power and which are impotent.

But surely scientific ideas are not themselves inherently political or ideological, or shaped by such influences? Well in fact they sometimes are, even if in ways that are not recognized or might seem unlikely today: consider, for example, the sociopolitical dimensions of Rudolf Virchow’s cell theory,⁴ Pascual Jordan’s work on quantum mechanics and its biological implications,⁵ or indeed Darwin’s views on the moral and intellectual hierarchy of races.⁶ Galileo’s problematic *Dialogue Concerning the Two Chief World Systems* was itself saturated in the philosophical, religious, and political contexts of his time.² For a more topical perspective, the pandemic strategy of “herd immunity”, aka “focused protection”,⁷ no longer seems a dispassionate argument based on epidemiology and virology, advocated and supported as it is by a right-wing, libertarian US thinktank that endorses antivaccination arguments.

The issue is not, then, whether and how science can resist being “politicized”, but how the political and ideological dimensions of science can best be managed to make it most effective and beneficial both as an intellectual quest and as a means of, as Bacon put it, relieving (hu)mankind’s estate.

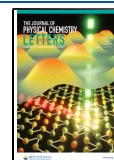
Science Has Always Been Political. History should in fact teach us to be wary of claims that science is and must be “apolitical”. It was precisely because of the insistence of the German academic world that it remain “apolitical” that professors were discouraged from protesting the expulsions of “non-Aryans” from their departments under the Nazi civil service laws.⁸ That silence is a stain on the integrity of science, as is the way many scientists in Nazi Germany used their devotion to their work as a way to avoid hard moral choices—even though only a minority actively embraced the regime.

We should recall too that most of those scientists who accepted without question the racist aspects of Darwinian theory or the prejudices with which eugenics was imbued in the early twentieth century did not do so because they would have considered themselves prejudiced; they merely thought they were following science to its logical conclusion. The assertive nationalism that gave us element names such as germanium, gallium, holmium, and scandium in the 19th and early 20th centuries was perfectly normal for its time. The internationalist nature of science, while today considered an

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inspirational contrast to the global rise of nationalism, was widely distrusted or denied both before and after the First World War; Max Planck and Fritz Haber were among those who had little time for it, even though both suffered from the surge of extreme nationalism in their homeland. It would be both naïve and hubristic, then, to imagine that science today is an ideologically neutral pursuit of truth that has no need to consider, from time to time, how and why it does what it does.

The evidence is overwhelming, for example, that women,⁹ minorities,¹⁰ and people of low socioeconomic status¹¹ still suffer from systemic biases in science. That is not a problem to be solved simply by removing the wall-to-wall portraits of white European men (the so-called “dude wall”; Figure 1)



Figure 1. A “dude wall”, an all-too-familiar sight in scientific institutions (here the NIH Clinical Center), sends out a subliminal message of what it means to be a “great scientist”. Image: Bevil Conway.

from the academies, but it is reason enough to consider whether the time has come to make such actions part of the package for redressing these imbalances. If measures like this were to play even a small role in increasing representation in science—perhaps by no longer delivering an unrelenting, subliminal message of what a successful scientist must look like—that would not only be a step toward greater equality (which would be reason enough); it would also give science the well-attested benefits of more diversity. As historian of science Naomi Oreskes argues, “Diversity [in science] is crucial because...it increases the odds that any particular claim has been examined from many angles and potential shortcomings revealed. Homogeneous groups often fail to recognize their shared biases”.¹² To suggest that science should be immune to calls in the broader society to re-examine the biases and incentives that inhibit diversity is not just in itself a political act, but moreover one that may be against the interests of science.

Are such efforts ideological interference in science? If you believe that science has somehow become unique in evading all the inequalities and injustices that beset our societies, perhaps it will seem that way. But that is wrong, not least because the very nature of what constitutes facts and knowledge is socially mediated. As Oreskes says

*Those of us who wish to defend science from ideologically and economically interested attack must be not only willing and able to explain the basis of our trust in science, but also to understand and articulate its limits. This means coming clean about the various ways in which things can go wrong.*¹³

The better question is how inequalities and biases should be addressed—and how far we should go in doing so. When

University College London decided earlier this year to rename its Galton and Pearson Buildings because of the racist eugenic views of those two men,¹⁴ was science succumbing to “cancel culture”? Such a suggestion would be deeply naïve. No one is proposing that Francis Galton and Karl Pearson be expunged from textbooks; indeed, if anything the demand is for adding *more* historical context, not least because in their cases their views on race—which were prejudiced even by the standards of their time—surely have a bearing on what they believed about human behavior. The textbook is the best place for explaining and exploring their complex legacy; naming a building after them admits no discussion at all but merely implies that we consider them worthy of celebration as individuals.

Such reconsideration of how we write individuals into science itself is complicated. It is a long-standing tradition, for example, that laws, effects, and theories be named after their discoverer: the Pauli principle, Pauling electronegativity, the Stark effect. This has made the jobs of historians of science harder, since it reinforces the misconception that science advances through the insights of a succession of lone geniuses and leads to shallow arguments over priority. It seems most peculiar that science—ever keen to stress the primacy of ideas over personalities and to strip its official record of any glimpse of the individuals doing the work, using instead an impersonal, “objective” passive voice—should nonetheless place so much importance on naming equations, awards, institutes, and so on after people. As Shapin and Schaffer have shown,¹⁵ the depersonalized style of the literature was consciously adopted in the early modern period as a rhetorical strategy for securing authority of voice—it was, you might say, a power move. Shapin has shown how artificial this denial of the role of the personal continues to be in modern science and how the uncertainties of the scientific endeavor make personal and moral traits more central to the practice than ever.¹⁶

Learning from the Case of Physics under the Nazis. Science’s obsession with naming creates hostages to fortune when it must confront its history—as, for example, when we must acknowledge that Johannes Stark of the “Stark effect”, which won him a Nobel prize in 1919, was a virulent anti-Semite and Nazi who said that Hitler and his comrades “appear to us as God’s gifts from times of old when races were purer...and minds were less deluded”.¹⁷ Stark and his compatriot, physicist Philipp Lenard, advocated an “Aryan physics” that rejected the alleged mathematical fabrications of Einstein’s relativity, which they said was a degenerate “Jewish physics”.¹⁸ “Respect for facts and aptitude for exact observation,” wrote Stark, “reside in the Nordic race”.¹⁹ He was, then, rather more extreme than is evident in Krylov’s suggestion that he merely “defended expulsion of Jews from German institutions.”

Krylov mentions also the case of Peter Debye, whose seminal contributions to physics and chemistry seemed uncontroversial until he was accused in 2006 of having colluded with the Nazis while working in Germany until his departure for Cornell University at the end of 1939.^{20,21} In making that departure, Debye was not fleeing Hitler; he had no reason to do so. Rather, he left his position as head of the Kaiser Wilhelm Institute of Physics in Berlin with great reluctance, having invested much in its status, because the Nazi authorities were demanding that he renounce his Dutch citizenship and become German. Had they not done that, it seems likely he would have seen nothing problematic about remaining in a position of authority in a regime that, by that

stage, anyone with eyes to see would have recognized as oppressive, undemocratic, and indeed genocidal.

Debye's case is an excellent example of how hard it can be to judge the morality of scientists.²¹ Krylov implies that this is why we should avoid doing so, and thereby avoid imposing today's standards on people who lived amidst very different mores. But the discussion should not be about simplistically judging Debye guilty or innocent. Debye was evidently no supporter of the Nazis, and my own view is that it is certainly not for us to declare that we would have made better, more moral decisions in his (very difficult) circumstances. I do judge him, however, for his complacent presumption after the war that he had no questions to answer—in other words, that scientists can and should be free to pursue their research without regard to the regime and society in which they do so.

Thus, a case like Debye's is indeed complex, as Ehrler et al.²² acknowledge in their discussion of naming conventions in science. (They do not, contrary to Krylov's implication, call for Debye's "cancellation".) So too is the question of finding an appropriate response. The University of Utrecht's initial reaction, to remove Debye's name from the institute for nanomaterials science before a careful consideration of the matter,²³ illustrates the dangers of a rush to judgment. (His name is now reinstated.) But it is surely right that such events should force us to consider whether the idolatry shown to many scientists (along with other public figures) is wise. For Cornell chemist Roald Hoffmann to question,²⁴ for example, whether Debye's name should remain attached to a Cornell lectureship and chair, and whether his bronze bust should continue to be on prominent display in the entrance to the chemistry department—as opposed to moving it to a less visible location—might, if one were so inclined, be offered up as an example of cancel culture. But it is surely more proper and humane to see it as an appropriate suggestion from a department member who lost many of his family in the Holocaust.

The Debye affair prefigured today's often intemperate debates about public monuments to and statues of historical individuals associated with oppression, colonialism, and racism.²⁵ The argument that retaining these memorials serves as a reminder of this disgraceful history is made either in ignorance or bad faith, often by people who in fact would rather see that history buried, who advocate for "patriotic" textbooks, and antagonize institutions and museums that attempt to present the real historical context. Most historians recognize that statues and other memorials are not a part of history and that history does not rely on them.²⁶ They were typically created in the same sense that they are now defended: either in denial or in ignorance.

Take for example the naming of lunar craters after Lenard and Stark by the International Astronomical Union (Figure 2).²⁷ When quantum physicist Mario Krenn realized that this had happened, and he and I contacted the IAU to challenge it, the Union's nomenclature committee were commendably upfront: they admitted to having no idea of the extent of the Nazi affiliations of these two scientists, agreed that it was inappropriate to honor their names this way, and took immediate steps to rectify the situation.²⁷ It was, in other words, an ignorance of history that caused the situation, and history itself was the corrective.

What is particularly telling is that the IAU admitted that they had taken their lead from the Nobel prizes awarded to these men, assuming that this in itself made them worth celebrating,

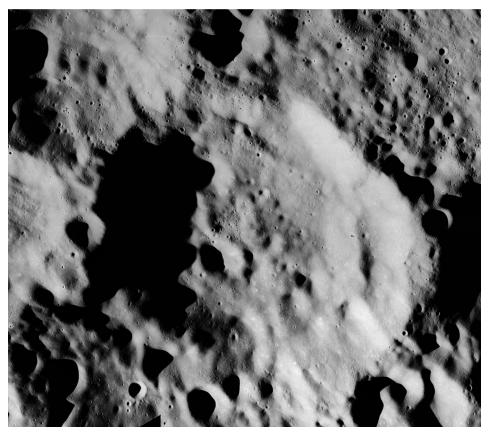


Figure 2. Nazis on the moon? Stark crater on the Moon's far side was named after the German physicist and avid Nazi supporter Johannes Stark. It is now being renamed, after Stark's history was pointed out to the International Astronomical Union. Photo: Arizona State University, Apollo Image Archive, Apollo Browse Gallery, Apollo 15: Mapping (Metric) Camera.

and not looking much further into the matter. It is unfair to single out the IAU for criticism, for this episode reflects the common habit within science: to imagine that scientific and professional accolades are enough to merit literally putting the individuals on a pedestal, and indeed that such awards and status somehow counterbalance flaws of morality or personality. When an invitation to speak at London's Science Museum in 2007 was withdrawn from James Watson after he told the *Sunday Times* that he considered it clear that Black people had lower average intelligence than whites, biologist Richard Dawkins complained that this was the action of an illiberal, intolerant "thought police" against "one of the most distinguished scientists of our time".²⁸ Others defended Watson's right to maintain a "scientific hypothesis"—even though the basis of Watson's suggestion (which is refuted by experts on intelligence and genetics) was not data but, it seemed, simply bigoted anecdotal experience.

Discussion, Not Denial. Personally, I do not see compelling arguments for renaming the Debye constant or Newton's laws—perhaps in part, I concede, because of habit and sentimental attachment to old ways. I can live with Heisenberg's uncertainty principle, even though Werner Heisenberg was more morally compromised during the Nazi regime than was Debye.²¹ I dislike having to speak of the Stark effect, but I can just about live with that too. I welcome the demise of Stark and Lenard craters, much as I am thankful that the Lenard Institute at Heidelberg was renamed after the Second World War.²⁹ And these are simply my current personal views, open for discussion. The point is that questioning how we memorialize scientists who made important discoveries (which can begin by desisting from designating them as "great scientists") surely does not in itself constitute some crossing of a line into an ideological "politicizing" of science. Rather, the discussion, like that of any morally complex issue, should be case-specific: what is the best resolution in *this* instance?

So the task of making science fit for purpose in the twenty-first century should not be distracted by empty "culture wars" arguments about "extreme left-wing" infiltration. Of course it is always possible to find extreme cases where individuals or practices have been condemned for fanciful reasons of

insufficient ideological purity, just as it is easy (which is why I have resisted) to point to how the far right whips up fervor against “Marxist woke ideology”. We should not waste our time with such things, but instead consider carefully and in an informed manner how we can best make science more exemplary of the inclusive, equitable, and humane endeavor that it aspires to be.

That the practice of science is inherently political is recognized by most serious scholars of the history, sociology, and philosophy of science. Certainly there are some scientists working on problems so far removed from any practical applications that they have the luxury of imagining their pursuit is free of all “taint” of politics or ideology. Even they, however, might be hostage to the prevailing political climate: will this space mission or supercollider be funded? But in much of science, it would be dangerously naïve to suppose that the job of the scientists is merely to generate facts for consumption in the political and economic marketplace—facts, say, about climate change, health, genetic diversity, devices for the information ecosystem. Often this naivety stems from a dangerously narrow view of what responsibilities a scientist has—as pointed out by Haberer decades ago³⁰ and again illustrated during the Covid-19 pandemic. It is not enough to imagine that those responsibilities stop with the caliber of one’s scientific work or of one’s objective advice in administrative and political roles. As physicist Joseph Rotblat said in his address for the 1995 Nobel prize for peace

*Precepts such as ‘science is neutral’ or ‘science has nothing to do with politics’ still prevail. They are remnants of the ivory tower mentality, although the ivory tower mentality was finally demolished by the Hiroshima bomb.*³¹

Krylov cites Robert Merton’s “clear separation between science and morality”. But Merton’s notion of a “pure science”, while it might have suited Heisenberg well, “sits in tension with the historical reality that scientists have always had patrons with motivations of their own, and which only rarely involved the pursuit of knowledge for its own sake”, according to Oreskes.³²

“Seen this way,” Oreskes says, “the idea of science as a value-neutral activity is a myth.”³³ Not only is it patently untrue (as history shows again and again), but it is also a poor strategy for winning public trust. Why would you believe and trust someone who professes to bring no values to their work, to do it free from all ideologies, biases, and social preconceptions? And why would you want to? It is far preferable to lay our values on the table where they can be discussed and challenged than to pretend or insist that the scientific community is engaged in some rarefied pursuit free from all social, political, and ideological influence.

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Notes

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men. The Negro or the Jew will view the same world in a different way from the German investigator.”

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