NATALIE B. AVILES AND JANET VERTESI

Merton Redux: Re-Confronting the Norms of Science in Democracy

When the second Trump administration took office in January 2025, the executive branch moved forcefully to slash federal funding for science. It posed challenge after challenge to the long-standing precedent of federal support for research: an "existential threat" to planetary science at NASA, shattering cuts to biomedical research at the National Institutes of Health (NIH), and many others. Many months later, when Congress passed its budget for fiscal year 2026, its decision to maintain an apparent continuity in funding for NASA and NIH seemed to many observers a rejection of the administration's efforts to cut federal investment in these research areas. Yet the threat has not passed. Although public attention remains focused on funding, the decimation of the democratic institutional processes that undergird state-sponsored scientific research is far more consequential.

In this chaotic time, Vannevar Bush's *Science, the Endless Frontier* has emerged as a symbolically meaningful text among scientists, who frequently point to it as the basis for the government's long-running support of university research. Certainly, Bush marked a call for a new industrial policy in the United States that would make the nation a global leader in the new world order. He would later be credited as the architect of the so-called social contract of science, whereby federal funding is allocated primarily to university researchers in pursuit of free inquiry that might later yield some economic or social benefit. But this mythologized rendering of the innovation system overlooks other key ideas, like those expressed by sociologist Robert K. Merton, that described how the United States should govern science democratically based on lessons learned from the Second World War. Rereading Merton now, even more than revisiting Bush, better exposes the vulnerabilities driving us, as social scientists, to defend a vision of science as—and for—democracy in our own era.

A major figure in American sociology and a professor at Columbia University from 1941 until 1979, Merton casts a long shadow over contemporary sociology of science. As a *structural-functionalist*, his sociological approach assumed that the way institutions are structured strongly influences the social orders that allow them to serve different vital functions in society. Most enduring is his work from the 1940s addressing what he called "the normative structure of science," which is still taught as "the norms" of science: communalism (science as communal property), universalism (participation without prejudice), disinterestedness (against ideology), and organized skepticism (deliberative, not dogmatic). These conditions, which Merton claimed are distinct to free scientific inquiry, allow science to thrive as an institutional form.

History was not kind to Merton's norms. From the seventies onward, they were attacked as descriptive claims that did not hold up to how science was actually done. Sociologists entering the lab found scientists dedicated to preserving their ideas and secretive about their findings. Coming in for particularly harsh criticism was Merton's

observation that some scientists wished to hold science apart from society as "a self-validating enterprise which was in society but not of it." In recent decades, scholars have painted Merton's norms of science as misplaced idealism, a mistaken result of his underlying commitment to structural functionalism, or (at worst) a perspective that legitimates and upholds the social exclusions and political inequities of science.

Rereading Merton today reveals his norms in a new—and newly relevant—light: They offer a direct critique of science under totalitarianism and a prescription for its democratic protection. In the decades leading up to Merton's early work, German universities and research institutes became leaders for scientific work, attracting the best students from all over the world. German was a lingua franca within many sciences—chemistry, biology, medicine, physics, and psychology, to name a few. The world watched as these renowned scientific institutions were brought under direct control of the Nazi Party, which displayed an "ambivalent and unstable" regard for science, Merton noted. As the Third Reich reallocated state investments toward science that "promise[d] direct practical benefit" to their regime, they purged science of those whose personal attributes and "extrascientific affiliations" made them, in the party's mind, "a priori incapable of anything but spurious and false theories." The famous out-migration of prominent scientists from Germany, including Nobel laureates Albert Einstein, James Franck, and Erwin Schrödinger, was one byproduct of this policy, but the process also included bureaucrats. Merton described how the combination of authoritarian politics, ethnonationalist culture, and utilitarian economic concerns produced a "general tone of anti-intellectualism" that destabilized the legitimacy of Germany's once-revered systems of knowledge production.

Reading Merton's "normative" writing on science as a *prescriptive* text, not a descriptive one, makes visible his desire to counter the active dismantlement of prestigious and powerful scientific institutions in Nazi Germany. What interested Merton the structuralist was not cataloguing scientists' unique cultural attitudes, but determining which institutionalized structures could shield scientific inquiry from the ideological incursions and destructive power of populism and the authoritarian state. In his view, a liberal order had afforded some degree of autonomy to nongovernmental scientific institutions. But then these institutions were subsumed under centralized state power, "placing science in a new social context where it appears to compete at times with loyalty to the state." More specifically, he observed that "dictatorship organizes, centralizes, and hence intensifies sources of revolt against science that in a liberal structure remain unorganized, diffuse, and often latent." Only such a "liberal structure" could counter the populist and authoritarian approach.

Observing Nazi Germany, Merton expressed the need to secure the autonomy of science by integrating it into a pluralistic democratic political order. Such a system would need to be distributed and diffuse, replete with checks and balances to ensure no one unit could control the rest. Members of the scientific community adhering to Merton's norm of disinterestedness (as opposed to political operatives guided by partisan loyalty), must direct and ensure policies were well-informed and state-supporting, while allowing science to remain formally autonomous from political direction.

If Merton's normative commitments express the structural forms he hoped would insulate science from incursions of state control, his writings reveal an ideal for national scientific institutions that proved influential during American postwar reconstruction. As the US government undertook massive capacity-building projects—including the National Laboratories, the National Science Foundation, NIH, and NASA—each agency fundamentally diffused responsibility for funding, agenda-setting, and techno-scientific administration. The results defy attempts at centralized direction and maintain a distinct "sphere of autonomy" for scientific deliberation through a separation of powers.

As far as we know, Merton did not directly advise the foundation of scientific agencies, although he moved in similar circles as those who did. And while both "The Normative Structure of Science" and *Science, the Endless Frontier* have complex histories, we argue these texts should be read side by side, as guidance for how to embed scientific institutions within a representative democratic state structure that could encourage innovation while discouraging the destruction observed under totalitarianism. The famous debates between Vannevar Bush and Senator Harley Kilgore expressed these same tensions: the senator opting for a vision of democracy enacted through geographical apportionment and electoral oversight, the scientist countering that government oversight *itself* was antidemocratic and that scientific agencies required independence to thrive. Rereading Bush through Merton, this enforced separation from electoral politics through distinctive institutional structures for science aimed to safeguard a far-reaching notion of democratic pluralism.

As sociologists of science, we have been surprised to see how deeply Merton's normative structure has become embedded in agency activities, cultural practices, and core commitments at state agencies like NIH and NASA. At NIH, Congress authorizes a budget to be allocated by civil servants based on input from scientists throughout the United States. The vast majority of NIH spending goes to funding investigators at universities whose work is judged meritorious by their peers in a highly competitive grant process. Similarly, NASA priorities are developed via a community-organized decadal survey managed through the independent National Academies. Missions are subject to congressional appropriations oversight, and their funding requires

coordination among the executive branch, Congress, and the space agency. Such diffuse mechanisms preserve a distinct sphere of autonomy in which science is communally directed through organized deliberation and debate.

These structures are visible across the US science enterprise, wherever members of the scientific community play a central role in directing how the government spends taxpayer money to support scientific research and workforce development. For the civil servants we encounter in our research, Merton's norms have become a "self-fulfilling prophecy"—another Mertonian turn of phrase—instantiated through robust forms of peer review and adherence to conflict-of-interest restrictions, through layers of bottom-up governance and oversight. They are also enacted through a grant-making process that is overseen by government patronage and regulation, but which operates at arm's length from ideological prescriptions. These processes emerge from a commitment to Merton's first principles of ensuring science and democracy, even as they entangle knowledge-making institutions under state-sponsored technoscientific industrialism.

This long-established social order of science has recently taken central stage as it has broken down. In the past year, civil servant scientists at NIH and NASA report considerable disorientation as the administration seeks to centralize their previously pluralistic systems of decision-making. It's not merely the defunding of fruitful and evidence-based scientific streams of research (such as work on environment and climate) that's been disconcerting. NIH staff have expressed alarm at the cancellation of peer-reviewed grants that include terms related to race, gender, or sexual orientation alongside an injunction to prioritize the president's political agenda over peer review in the allocation of highly competitive grant funding. These actions renegotiate the *normative* social contract between scientists and the state by turning to political oversight instead of "disinterestedness" and "organized skepticism." Formerly independent oversight roles and committee positions have been filled with those who pass ideological litmus tests in line with administration goals, such as vaccine hesitancy. Civil servants who are concerned about the politicization of their agencies report that they have been silenced by a "culture of fear," as one recently suspended NIH program officer put it, formalized through recent rule changes that remove tenure and whistleblower protections.

Although the language directing these activities appears to support Merton's norms, many professionals feel the new executive order on "Gold Standard Science" and similar pronouncements violate their fundamental sensibility about the appropriate relationship between scientific advising and a democratic state. Indeed, many civil servants are experiencing another Mertonian state—*anomie*—as the rules under which they have long labored are altered in real time, leaving them feeling bereft, angry, and dissociative. It is not an opposition to politics per se, but a deeply felt reaction to the *wrong* politics—political directives, financially interested parties, non-meritocratic selections, and decisions made outside the community of science—that they identify as undemocratic.

Amid these challenges, Merton's norms can be seen as both foundational and aspirational. Norms do not direct action with institutional automaticity, but they do function as directives that guide civil servants' activities and sensibilities, enabling their investment in the missions of their agencies and the day-to-day work through which science proceeds.

When democratic foundations to science are unsettled through newly imposed processes and people, scientific communities can still reclaim space for their preferred order. Everyday workarounds to formal processes and appeals to sustaining social relationships can evade political impositions. Some critics decry the use of such informal interactions in science governance, but as research into the civil service under the first Trump administration shows, such methods more often help federal employees uphold democratic norms against autocratic overreach.

Civil servants have reason for their dismay—as well as reason to hope for the future. As the institutional order that supported democratic pluralism in science policy decays, workarounds will be necessary to ensure broader governance; a wider range of interests weighing in on science as a public good; and the collective maintenance of codes of conduct, integrity, and professional ethics. Above all, amid today's changes to government science, we suggest a return to Merton's writings. They take on a fresh urgency as a vision of what science should be—in its institutions, its practices, and its protection under a democratic order—all based on observations of what happens when it is not.

Natalie B. Aviles *is an assistant professor of sociology at the University of Virginia. A social scientist who studies policymaking at the National Institutes of Health, she is the author of* An Ungovernable Foe: Science and Policy Innovation in the US National Cancer Institute *(Columbia University Press, 2024).* ***Janet Vertesi*** *is an associate professor of sociology at Princeton University. An ethnographer with NASA's planetary science missions, she is author of* Seeing Like a Rover: How Robots, Teams and Images Craft Knowledge of Mars *(University of Chicago Press, 2015) and* Shaping Science: Organizations, Decisions, and Culture on NASA's Teams *(University of Chicago Press, 2020).*

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