FORUM

Issues regularly receives numerous letters from readers responding to our articles. We print some of them here. A fuller collection can be found in our online Forum: https://issues.org/section/forum/.

CHAKAIA BOOKER, *Conflicting Issues*, 2023, rubber tires, metal, and wood, 26 x 26 x 24 inches.
Copyright of the artist and courtesy of David Nolan Gallery.

IF YOUR SNARK BE A BOOJUM

In *The Hunting of the Snark*, Lewis Carroll narrates the quest by nine men and a beaver for an elusive creature no one has ever seen. A Snark, the poem tells us, is known only through five ill-assorted characteristics: It is crispy when cooked, gets up late, can't take a joke, has a fondness for bathing machines, and is ambitious. The Snark never appears throughout the poem, though one of the hunters mysteriously vanishes on meeting the Snark's evil alter-ego, a Boojum.

Trust in science has lately emerged as the Snark of American politics. Analysts as motley in their disciplinary identities as Carroll's hunters devote endless energy to identifying the causes of a phenomenon that remains hard to pin down except through statistical means that notoriously create the very phenomena they claim to be studying. "The Strange New Politics of Science" (*Issues*, Spring 2025), by M. Anthony Mills and Price St. Clair, adds to this venerable genre.

Loss of confidence in science, the authors argue, has emerged as a new axis of polarization in America, especially since the COVID-19 pandemic. Not only have Republicans and Democrats changed places in their relative degrees of trust in science, but the disparity has grown more extreme. According to a Pew Research Center survey, Republicans "remain 22 percentage points less likely than Democrats to express a 'great deal' or a 'fair amount' of confidence in scientists." This widening split, Mills and St. Clair conclude, threatens the legitimacy of government and destabilizes society as whole.

Yet in spite of the best efforts of data collectors, the object at the center of their quest remains strangely undefined. It is unclear from the growing literature

continued on page 8

CHAKAIA BOOKER: TREADING NEW GROUND

Chakaia Booker has worked with black rubber tires as her sculptural medium since the 1980s. Early in her career, she experimented with textiles, clay, wood, and found objects, before turning to salvaged tires—retrieved from the streets of New York City's East Village, where she lives. Through cutting, coiling, and contorting the tires, she transforms this industrial waste into remarkably graceful sculptures that defy their origins. Materiality and modularity are essential elements in her work. Her ability to build texture, movement, and form through repetition creates tactile and seductive surfaces. As she finds beauty in refuse, her reclamation of discarded tires offers a fresh perspective on her materials and on humanity's relationship with and responsibility to the environment.

Tires offer a rich array of historical and cultural associations. They relate to labor, transportation, industrialization, and environmental destruction. The tire's patterning also connects to African traditions of textiles and scarification, and their resiliency and range of tones evokes issues related to the Black body, history, and identity. Booker's process of transforming scraps into art serves as a metaphor for Black American experiences of struggle and survival.

"My intention is to translate materials into imagery that will stimulate people to consider themselves as a part of their environment—one piece of it," Booker states. Her sculptures aim to convey a sense of the realities from which the materials emerged while also presenting new possibilities for their use and interpretation. In the context of global natural disasters, ecological advocacy, and humankind's reckoning with the effects of climate change, Booker projects a new vision for the world through her art.

Treading New Ground presents three monumental wall relief sculptures: *Acid Rain* (2001), *It's So Hard to Be Green* (2000), and *Echoes in Black (Industrial Cicatrization)* (1996). Each measuring 20–21 feet wide, the sculptures feature spiky shards, coiled strips, and looped bands of car, truck, bicycle, and airplane tires. Their titles, materials, and making all point to the social, political, industrial, and emotional dimensions of efforts to care for the environment. Booker's practice of salvage and reuse reduces tire waste otherwise destined for landfills, where they emit methane gas into the atmosphere. Installed on the walls of the National Gallery of Art, the exhibition offers a setting in which visitors can contemplate Booker's extraordinary transformation of discarded materials and the implications of her constructions.

The exhibition also features a six-part photogravure series, *Foundling Warrior Quest (II 21C)* (2010), which further illuminates Booker's long-standing commitment to environmentalism. Dramatizing the process of scavenging tires and other materials, the images depict the artist as a mythical figure foraging in a dystopian landscape. Booker created the sepia-toned imagery as a satirical foil to *The North American Indian*, a set of photogravures from the early 1900s by photographer and ethnologist Edward Sheriff Curtis, whose colonial,

romanticized depictions were at odds with the lived reality of Native people. Booker's series conjures up a distant past as much as it alludes to a future environment stricken by the effects of climate change.

Booker gained international acclaim at the 2000 Whitney Biennial with *It's So Hard to Be Green* (2000). She received the Pollock-Krasner Grant in 2002 and a Guggenheim Fellowship in 2005. She has exhibited in group and solo exhibitions nationally and internationally and her work is in more than 40 public collections.

In the Tower: Chakaia Booker: Treading New Ground is on view at the National Gallery of Art, Washington, DC, through August 2, 2026.

CHAKAIA BOOKER, *Acid Rain*, 2001, rubber tires and wood, overall: 120 x 240 x 36 inches; each armature (3 total): 80 x 48 x 1 inches; tire pallet (12 total): 22 x 48 x 40 inches. National Museum of Women in the Arts, Washington, DC. Museum purchase: Members' Acquisition Fund © Chakaia Booker. Photo by Lee Stalsworth.

on trust in science what exactly the public disavows: trust in scientists, in expert claims, in specific bodies of knowledge, in the institution of science, or in the authority of scientists to steer public policy.

Turning to solutions, Mills and St. Clair rightfully reject simplistic explanations for the rift between Republicans and Democrats, such as public ignorance or hostility to government, but their own proposals seize on the wrong end of the stick. Leaning on the work of the British sociologist Anthony Giddens, they suggest the problem lies in "abstract institutions" that have lost contact with the citizenry. Maybe so, but then "re-embedding" experts in relationships with their institutional clients may not be the right response.

Research shows that America more than any other industrial society tries to resolve political problems as if they are fundamentally scientific. It is hardly surprising, then, that when politics becomes intransigent, science also proves vulnerable. One can't rely on re-embedded experts to paper over deep-seated political differences concerning the appropriate distribution of risks and benefits or the minimum levels of public support owed to citizens in a society.

Like many predecessors, Mills and St. Clair suggest that producing more buy-in to science will lead to a more stable society and politics. The evidence suggests to the contrary that a more trustworthy politics leads to more buy-in for expertise. If we lose sight of the quality of our politics, then our institutions, like Carroll's unfortunate Baker, may "vanish away" when the Snark of skepticism toward science turns out to be the Boojum of a decaying democracy.

Sheila Jasanoff
Pforzheimer Professor of Science and Technology Studies
John F. Kennedy School of Government
Harvard University

M. Anthony Mills and Price St. Clair provide valuable insight for addressing poor public trust in science, but more attention is needed on how the structure of expertise itself contributes to the polarization that they document.

Research on self-reinforcing orientations to expertise by the communications scholar Benjamin Lyons gives reason to think Mills and St. Clair's proposed solutions to public distrust of science may be structurally inadequate. Negative prior experiences create cognitive frameworks that make individuals more resistant to expert claims and more susceptible to counternarratives. Thus, subsequent improved expert-public interactions may not be enough to disembed that frame.

This insight challenges the authors' optimism about rebuilding trust through improved communication and political diversity. Their historical comparison to the 1970s is instructive but incomplete; the reforms they praise (creation of the Office of Technology Assessment, increased oversight of research) succeeded not only because they improved expert-public communication, but because they restructured the relationship between expertise and democratic authority. These reforms acknowledged that expert legitimacy requires more than technical competence; it requires institutional mechanisms that make expertise accountable to democratic processes and values.

Lyons's research suggests that current forms of scientific expertise may be systematically generating negative orientations to expertise among a significant portion of Americans. The professionalization processes that ensure technical quality—peer review, credentialing, disciplinary boundaries—also create experiences of exclusion and dismissal for those whose knowledge, values, and concerns fall outside professional jurisdiction. These experiences accumulate into stable orientations that condition how individuals interpret subsequent expert claims.

This problem of legitimacy for science has been addressed by efforts to democratize science via public participation in science. But this creates an inescapable tension: Public participation chips away at what makes scientific knowledge special and what makes specialists most suited to make technical judgments in their areas of expertise. This paradox puts expert systems and democratic values into frequent conflict, as science cannot be populist nor should it be elitist.

This crisis of public trust in science seems to require more substantial changes than better communications and diversity initiatives launched after the political attacks on DEI—diversity, equity, and inclusion—initiatives. We are challenged to rethink how expertise itself is organized and legitimized. This could include developing forms of "democratic expertise" that maintain technical rigor while systematically incorporating broader participation in defining problems and evaluating solutions.

In sum, rebuilding trust in science may require not just better ambassadors for existing forms of expertise, but fundamental reconsideration of how expertise operates in democratic societies where citizens hold diverse values and worldviews.

Maya J. Goldenberg
Professor, Department of Philosophy
University of Guelph, Ontario, Canada

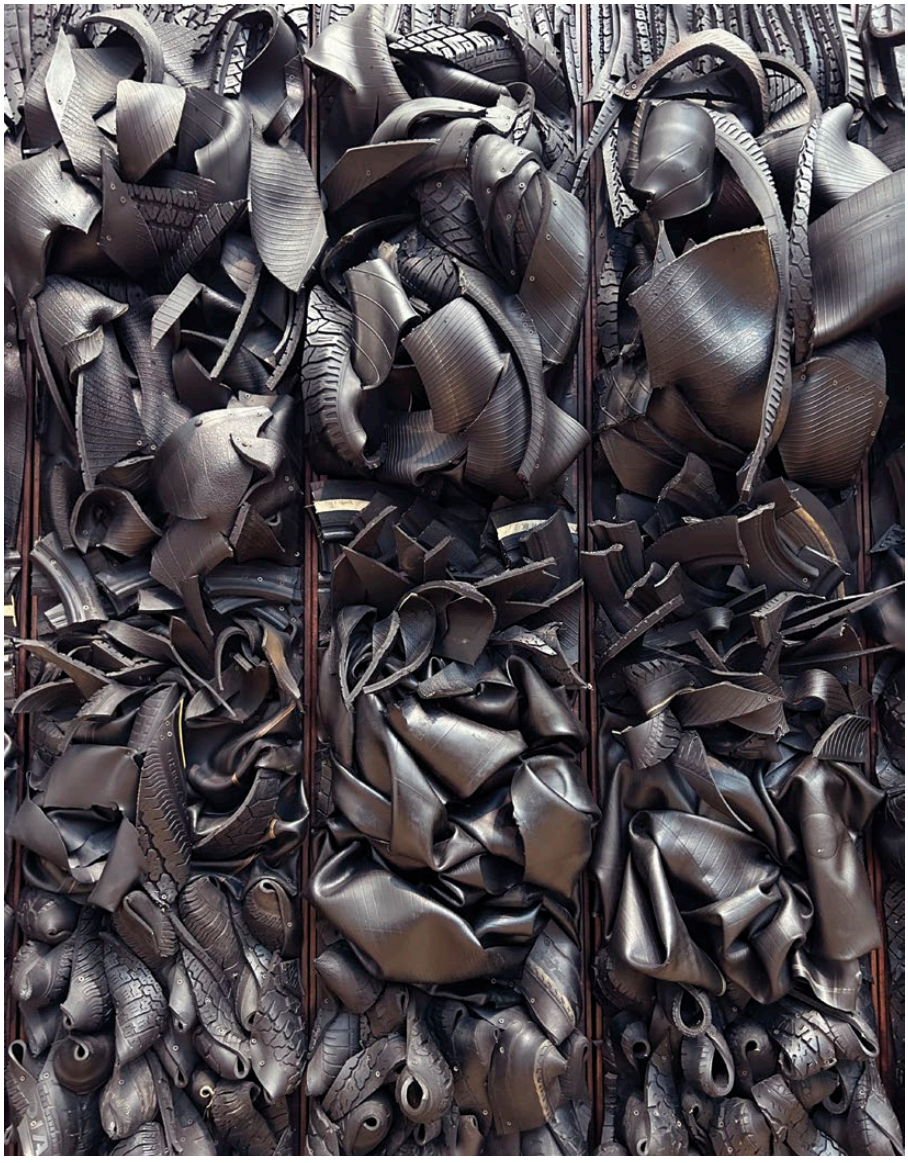
I appreciated the article by M. Anthony Mills and Price St. Clair and the interview with Celinda Lake and Emily Garner, "Who's Afraid to Share Science in Their Listserv?" in the Spring 2025 *Issues*. The articles' reading of the current moment—that it is less about distrust in science and more about distrust of the institutions and elites that do science—resonated. My mother and I share guardianship of my

sister, who has an intellectual disability. My experience with relevant research is rich, rewarding, and personal. I work in a university, so I can have coffee with experts, explore ideas, and ask questions. My mother served on an advisory board for the organization in which my sister lives and works—and where my mother's experience of research was distant, impersonal, and disempowering. A new regulation would arrive, based on research to which she had no input, and she would have to do the work of figuring out how to comply.

As the articles suggest, my mom's distrust of research isn't a deficit problem: she doesn't need someone to explain the research more clearly. It's not an invisible hand problem: it won't help to recount progress enabled by research. It is, as Mills and St. Clair describe, a "relational problem": my mother didn't get to know or interact with researchers, had no input to research agendas, never got asked about what she knew, and wasn't part of translating research into policy.

Solving the relational problems means inviting people from all walks of life to interact with scientists, set research agendas, contribute their knowledge, and participate in science translation and application. We have lots of ideas for how to do this.

Upscaling citizen science and participatory governance would allow more people to collect and use data to make personal and civic decisions. Universities could expand their extension and clinical models so that any city or community-based organization, no matter how small or far away, had a research partner. Community liaisons who listen for research ideas, open calls for topics and ideas, and community-designed requests for proposals could help drive new research agendas. Simplified application and reporting processes would open research to new organizations and free up time for collaboration. Participatory budgeting and expanded review panels would allow people from all walks to help make funding decisions. User-friendly open-access science publications and new use-focused products would give more people access to the research they are supporting. We can do meta-research about how to maximize the benefits of research for everyone. Patient's rights approaches give us a model for expanding participation on regulatory and advisory boards. Expanded scientific fellowships could offer nonpartisan and responsive research support to judges, juries, and lawmakers.



CHAKAIA BOOKER, *Echoes in Black (Industrial Cicatrization)* (detail), 1996, rubber tires and wood, 14 vertical modules, overall: 97 x 269 x 6 inches. Copyright of the artist and courtesy of David Nolan Gallery. Photo by Alana Quinn.

There is no better time to explore these and other approaches. Recognizing and responding to the current distrust of institutions and elites compels us to scale up these and other approaches in ways that support every American's ability to guide, participate in, and benefit from research.

Rajul Pandya
Executive Director and Professor of Practice
Mary Lou Fulton College for Teaching and Learning Innovation
Arizona State University

CHAKAIA BOOKER, *It's So Hard to Be Green*, 2000, rubber tires and wood, overall: 150 x 252 x 24 inches. Copyright of the artist and courtesy of David Nolan Gallery. Image credit: Peter Vanderwarker.

FIXING A DYSFUNCTIONAL FOOD SYSTEM

In "The Ozempic Era Could Shift Blame for Obesity From Individuals to Commercial Food Systems" (*Issues*, Spring 2025), Laura A. Schmidt and Luc L. Hagenaars argue that GLP-1 drugs might shift views away from thinking of obesity as a matter of personal responsibility. They propose instead that it might lead policymakers to focus on addressing societal responsibility for having created a food environment that encourages people to consume ultra-processed food products rather than real food.

Such a shift is long overdue. Three-quarters of American adults are overweight or obese, a trend that rose sharply between 1980 and 2000. What happened around 1980 to make that happen? Genetics did not change; the food environment did. Food became ubiquitous, even in places where it had never been previously allowed: clothing stores, bookstores, libraries. Portion sizes of muffins, bagels, soft drinks, and restaurant servings tripled or quadrupled, and so did their calories. People increased their calorie intake by 300 or so a day.

I see three causes of such changes. The first was the change in agricultural policy in the 1970s, from paying farmers to not grow food to providing incentives to grow as much food as possible. Farmers responded by growing more food. Calories in the food supply went from 3,200 per capita per day to 4,000, roughly twice population need. Food companies had to find ways to sell those calories.

Second was the advent of the shareholder value movement to provide immediate, higher returns on investment, and to increase those returns every quarter. This movement was responsible for the outsourcing of labor to low-resource countries and the drastic reduction of manufacturing in America, but it also affected food companies. It forced them to compete even more to sell products in an environment that already offered twice the calories anyone needed. The third cause was the election of President Ronald Reagan, whose deregulatory agenda gave food companies a break; it removed restrictions on marketing, especially to children.

Food companies responded by developing new ultra-processed products designed to be irresistible (if not addictive), and to make it socially acceptable for everyone to eat everywhere, often, and in large amounts. Anyone trying to maintain a healthy weight in this environment is up against an entire industry doing all it can to encourage eating more, not less.

When people do not eat healthfully, several industries profit—food, drug, and diet, for starters. Eating healthfully means taking on all of them. Countering this environment is impossibly difficult for individuals. That's why we need societal support to make healthful food choices easier and more affordable. Poor health is a systems problem. GLP-1 drugs may help, but they cannot address dysfunctional food systems.

Marion Nestle
Professor of Nutrition, Food Studies, and Public Health, Emerita
New York University

WHAT CAN SCIENCE PHILANTHROPY DO?

In "Science Philanthropy's Implications for American Leadership in Innovation (*Issues*, Spring 2025), Robert W. Conn, Peter F. Cowhey, Christopher L. Martin, and Joshua Graff Zivin present a cogent analysis of the important role of philanthropy in the US research ecosystem. It shows that philanthropy not only contributes a meaningful share of funding for basic and applied research, but also is a particularly important supporter of high-risk/high-payoff work that government or business is reluctant to fund.

Perhaps as a result of the time when the article was drafted, it could not reflect events following the presidential inauguration in January 2025. While the government in recent years has supported about half of basic and applied research, it no longer intends to do so. The workforces of important federal agencies have been slashed and research programs terminated. Important university performers of research have faced the threat that their federal funding will be eliminated, their tax-exempt status withdrawn, their endowments subject to punitive taxation, and their recovery of indirect costs limited. The Trump administration's proposed budget for fiscal year 2026 would impose drastic further curtailment in federal support.

Although some of these actions are being challenged in the courts, considerable damage has already been inflicted. Scientists are fleeing to other countries, the foreign students who invigorate the US workforce are now reluctant to study here, and graduate programs are shrinking. Unfortunately, Congress has not shown a willingness to resist the drastic changes now underway. The ecosystem Conn et al. describe reflects a more congenial time than the one in which we now find ourselves.

The consequences of these recent changes are severe. Basic and applied research have provided the critical means by which the United States has grown its economy, enhanced security, and nurtured improvements in our quality of life. The new markets, industries, companies, and capabilities arising from research have made the United States the most secure and economically prosperous nation on earth. The destruction of our scientific infrastructure is an immense self-inflicted wound.

It is not possible for philanthropy to fill the funding gap created by the retreat of the federal government. Nonetheless, the current situation reinforces the important point that the authors make about the need for coordination among philanthropy, business, universities, and nonprofit research institutions. The aim should be to develop a strategy to maintain US scientific capacity to the extent possible until the actions of the government can be reversed. It may take many years to rebuild what has been so swiftly destroyed.

It would be appropriate for a consortium of entities to convene leaders of the various affected sectors to develop this strategy. The effort might involve the National Academies of Sciences, Engineering, and Medicine, the American Academy of Arts and Sciences, the Science Philanthropy Alliance, the American Association of Universities, the Association of Public and Land-Grant Universities, and perhaps the Business Roundtable or the Council on Competitiveness. The argument for improving alliances among the supporters of basic and applied research is far more important now than the authors had reason to anticipate.

Richard A. Meserve
President Emeritus
Carnegie Institution for Science

Robert W. Conn, Peter F. Cowhey, Christopher L. Martin, and Joshua Graff Zivin rightly emphasize the benefits of cross-sector partnerships, pointing to examples of breakthroughs that come from collaborative public-private funding of science. The authors highlight the flexibility—and substantial financial support—that comes from philanthropic investment. They posit that philanthropy can incentivize—and grow—the research system to innovate in both subject matter and approach.

The call for improved synergies between government and philanthropy resonates. As president of the Science Philanthropy Alliance (which produces Science Philanthropy Indicators), I see an interest among philanthropies in partnerships that advance scientific discovery by amplifying resources and encouraging new or higher-risk activities, including de-risking ambitious technology projects before government funding is sought. As the fourteenth director of the National Science Foundation, I saw firsthand the benefits of public-private partnerships.

An example is the Simons Foundation, which has long partnered with NSF to advance interdisciplinary research. Another effective forum for encouraging cross-sector partnerships is the National Academies' Government-University-Industry-Philanthropy Research Roundtable.

The numbers presented by Conn et al. show that although philanthropy alone cannot rival the seminal support for science of the federal government, it is no small player in the research ecosystem. But exactly how big a player? The numbers are fuzzy because the data aren't all that transparent. The authors say there is a need to expand detail around the reporting on sources of philanthropic funds, including endowments and current funds.

We underscore their recommendation for universities to expand the level of detail provided to NSF and others regarding the source of funds used for research. Our own latest analysis finds that over a 20-year period, higher education institutional support for basic research at universities doubled from $9.1 billion in 2003 to $18.2 billion in 2023, while federal support for basic research increased by only 11% from $30.6 billion in 2003 to $34 billion in 2023 (inflation-adjusted dollars). Better data are needed to understand how much of this increased institutional support is enabled by philanthropic giving. Universities can play an important role by providing more information to NSF in the Higher Education Research and Development (HERD) Survey.

NSF's National Center for Science and Engineering Statistics provides much excellent longitudinal data on the funding of science. We encourage NCSES to collect and report more detailed data on philanthropy, building on its approach in the Nonprofit Research Activities Survey. This survey reports on expenditures by nonprofits supported by individual donors as well as foundations and other nonprofits. It also reports on internally funded research, federally funded research, and research supported by for-profit business and all other sources. As with universities, more data are needed to estimate how much of the internally funded research at nonprofit organizations is enabled by past philanthropic giving.

Philanthropy is fast becoming a key sector of the scientific research enterprise. Accurate data are needed to fully understand its impact—and potential—on the research funding landscape.

France A. Córdova, President
Kate E. Lowry, Strategy Director
Science Philanthropy Alliance

BEING A GOOD MENTOR

As I reflect on David Asai's article, "Inclusive Science Education Is Not Zero-Sum" (*Issues*, Spring 2025), I keep coming back to his call for researchers and leaders to take personal responsibility for broadening participation in science through efforts that advance belonging. While creating more inclusive learning environments will ultimately require the scientific community to fundamentally shift culture through new structures, policies, and practices, we cannot forget the important role that each of us has in making change.

Individuals have power and can both create and sustain equitable systems, even in the absence of specific programs and policies. We cannot wait for the system to function in ways that are more equitable and just—especially given the constraints of our current context. Rather, we must be brave, vulnerable, and willing to engage in our work in new ways to create a more diverse and inclusive science ecosystem where all scientists can thrive.

Asai offers thoughtful guidance on what this looks like in practice and what we, as individuals, can do to ensure that the science community welcomes the most talented and creative minds and opens its doors to include the perspectives of scientists from all backgrounds.

While Asai's principles of inclusion and allyship are critical on their own, they can be particularly powerful when incorporated into our work as mentors. The apprenticeship model that guides so many undergraduate research programs and much of graduate education and postdoctoral training provides ample opportunities to engage in mentorship. Mentorship is a powerful tool in accelerating the development and careers of *all* scientists and notably has been found to be particularly important in recruiting, retaining, and advancing the careers of scientists who have been previously excluded and felt unwelcome.

Too often, however, we miss the opportunity to fully leverage the impact of mentoring relationships, particularly on efforts to broaden participation. Many young scientists report dissatisfaction with mentorship, noting either that they don't have a mentor or that the mentorship they receive does not meet their needs. These critiques are particularly common among scientists with minoritized identities, who often find potential mentors to be aloof, unavailable, or skeptical about the unique challenges they face.

As Brad Johnson and I write in the most recent edition of *On Being a Mentor*, effective mentorship requires intentional efforts to cultivate personal connection, which is unfortunately often missing in many academic relationships. It may be tempting to focus singularly on "the science" while mentoring—building research, writing, and presentation skills that help trainees become good scientists. But if we are to advance commitments to inclusive excellence and strengthen the scientific enterprise, mentorship requires a greater emphasis on care and connection, shown through efforts to honor early career colleagues' identities and humanity. Mentors who are intentional about validating their trainees' experiences (even when they are unfamiliar), fostering inclusive learning

environments in their classrooms and laboratories, and serving as vocal allies create conditions for better science because they are advancing collective thriving. In addition to embracing them as principles, embedding Asai's proposed strategies in our practice is key to catalyzing and sustaining a more inclusive scientific community.

Kimberly A. Griffin
Professor, Higher Education, Student Affairs, and International Education Policy
College of Education
University of Maryland

THE FRAGILITY OF DOING GOOD

A grant for nonprofit work is an investment, and a proposal is the initial draft of a contractual agreement among the parties. Ryan Meyer and Evan S. Michelson's thoughtful discussion of grant proposals, "Proposals as Partnerships" (*Issues*, Spring 2025), highlights the negotiation between those who seek support and the donor providing financial backing for a project.

A lay reader might have benefited by knowing what the authors consider to be successful projects. At the international level, one might think of the Global Alliance for Vaccines and Immunization, which has played a prominent role in dramatically reducing child mortality. In the United States, the Marine Life Protection Act Initiative brought together citizen groups and donors to work with government in the creation of an ambitious network of 124 marine-protected areas in California's state waters. And the evolution of building codes favoring energy-efficient designs, often advanced by nonprofits, provides many exemplars at the community level.

A project is a process, in which a call for proposals is only an initial step. A proposal written in response, Meyer and Michelson observe, is a boundary object—something whose meaning is interpreted in multiple contexts but which has a significance shared across them. In order for a proposal to be funded, the parties need to articulate shared objectives, which are linked but not the same. (Oddly, the authors do not discuss external reviewers, who are often engaged to assist in the selection of proposals to fund.)

CHAKAIA BOOKER, *Foundling Warrior Quest (II 21C)*, 2010, set of 6 lithography and photogravure on paper each: 33 1/4 x 25 1/16 x 1 9/16 inches. Copyright of the artist. Image courtesy of David Nolan Gallery, New York, and Galerie Isabella Bortolozzi, Berlin. Photo: © Graysc.

For projects undertaken in dynamic settings, as most are, the proposal may turn out to be dysfunctionally static, committing grantees to courses of action that no longer fit the situation assumed when the proposal was funded. As with change orders in the world of commerce, periodic reports from grantees to funders can record the shifting but shared objectives and schedules of grantees, donor, and their partners. In these ways, the differences in goals and values of donors and grantees can be managed as they move from aspiration to outcomes.

Yet the goals of donors, grantees, and partners necessarily remain in tension. The goals are economic to a degree: Grantees and their partners must be able to pay employees and contractors. But philanthropic projects are not motivated by profit. This means that outcomes are usually difficult to identify in quantitative terms, and the most significant results may be intangible. (The latter can often be said of a successful business as well, of course.)

As a consequence, measuring success, even in the relative metric of cost-effectiveness, is a persistent challenge.

A corollary is that the worth of civil society itself remains open to question. The surprising actions taken by the current administration to slash federal funding in areas related—often only distantly—to activities with which it disagrees on political grounds demonstrate the fragility of what most people think of as doing good. Meyer and Michelson's ideas about how grant proposals can serve as an avenue for institutional change may need to wait, sadly, for a less contentious time.

Kai N. Lee
Center for Ocean Solutions, Stanford University
The writer is a retired program officer at the Packard Foundation, and emeritus professor at Williams College

GOOGLE "TOASTER LASER"

In "How Dual Use Puts Research Under the Microscope" (*Issues*, Spring 2025), Håvard Rustad Markussen asks a pragmatic and incredibly topical question: Is "dual use" still an appropriate term for export control discussions, especially in a higher education environment? He describes dual use as "technology with both civilian and military applications," echoing an approach nearly identical to export controls across the wider Western world. Yet the very notion of dual use is fraught with interpretive difficulty—even a toaster can have military application (if you doubt that, do a Google search for "toaster laser"). If all research and all technology are dual use (as Markussen contends), then how does one regulate and control access to and availability of potentially hazardous technologies?

In a way, the semiotics of export control bear resemblance to broader discussions on research security, where regulatory controls are applied to the conduct of research in higher education institutions in the interests of national or economic security. These controls are intended to be functionally protective of sensitive research, where the fear of access, dissemination, or diversion is focused on economic competitors or geopolitical adversaries (rather than "allies" or "friends," who are usually exempted from such rules).

Research security is not, in Markussen's example, a Norwegian problem, nor a European Union problem, but a transnational problem—with a national focus. Each nation, and indeed each institution, must decide its appetite for risks inherent in foreign collaboration in science and technology in a contested and fractured geopolitical environment. Too open, and one risks becoming a case study in foreign espionage and technology theft (just ask the president of Stanford University, which recently experienced intrusion by agents of the Chinese Communist Party). Too closed, and the institution suffers in attracting funding and talent, incurs reputational damage, and can suffer a fall in the global rankings that adjudge such institutions.

Markussen's solution is a "more nuanced and careful risk assessment framework"—and he's right. One might point to the experience of the Dutch virologist Ron Fouchier in his nation's courts in 2013, when he was forced to obtain an export control permit to publish a paper about a genetically modified influenza virus. So the challenge is really about a commonality of language: articulating *who* the risk is to, *what* the risk is of, and *how* the risk might manifest. Governments are increasingly keen to lock down research that offers them national advantage, whereas scientists and scholars are more likely to want to share that research for the good of humanity. There needs to be a far more open approach by governments to academia, and a far more willing approach by academia to the political, economic, and diplomatic impacts of their work—the uncomfortable middle ground. To quote E. William Colglazier in a Forum letter in the same *Issues* edition, "Basic research is still in the … national interest if done with our 'eyes wide open' about potential security risks." What is required is a common language, one that eschews "dual use" in favor of a dialect of risk that government, academia, industry, and the general public can all understand.

Brendan Walker-Munro
Senior Lecturer (Law)
Southern Cross University, Gold Coast, Australia

A CULTURE OF SCIENCE-INFORMED GOVERNANCE

In "Supplying State Legislatures With Scientific Expertise" (*Issues*, Spring 2025), Adam C. Jones, Jonathan Z. Kaye, and Harvey V. Fineberg correctly highlight a critical challenge with wide-reaching implications for both policy about science and science in policy: State legislatures operate under vastly different conditions than the US Congress, with far fewer resources, shorter sessions, and significantly higher turnover. Offices are often slim-staffed, and institutional memory can be fleeting. In that environment, maintaining technical expertise is a constant struggle.

As the authors point out, sustained, institutional support for science in state governance is vital. Even with frequent turnover of legislators, professionals working behind the scenes—staff, fellows, researchers, and agency personnel—carry forward the insights and infrastructure that enable better-informed policymaking. Their impact persists long after any one legislator has left office.

As one of the few scientifically trained legislators in the country, my background in physics shaped not only how I approach complex policy problems in science and technology, but also how I approach all policy. Naturally, training in science, technology, engineering, and mathematics—the STEM fields—allows for a deeper insight into complex technical issues, such as the regulation of artificial intelligence or advances in vaccines during a global pandemic. However, training in STEM goes much further than developing technical expertise in a field. It also includes the ability to break down a difficult problem into smaller parts, to quickly read and absorb the literature on topics outside your personal expertise, to evaluate sources, and to be naturally open to changing your mind when presented with facts that counter your point of view. Those skills are immensely valuable, regardless of the topic.

That's why I helped launch the Eagleton Science and Politics Fellowship at Rutgers University, which embeds PhD-level scientists in New Jersey's executive and legislative branches. These fellows provide real-time, fact-based analysis that helps foster a culture of science-informed governance. Created in 2019 after receiving a planning grant the year before, the program has been a resounding success, with fellows contributing meaningfully to not only health, climate, education, and technology policy, but to economic, housing, and social justice issues as well.

One concern I hear regularly from advocates and lobbyists is that states should not create a patchwork of laws and regulations governing a topic that has a national (or international) reach. And while I understand their concerns, I also know that states can and should move faster than Congress. After all, we are the "laboratories of democracy," to borrow the phrase coined by US Supreme Court Justice Louis Brandeis. But too often, states also work in isolation, crafting legislation in a vacuum or copying what was done in another state. That's why creating a national network of science policy fellows, in partnership with the National Conference of State Legislators and the Gordon and Betty Moore Foundation, is so vitally important. This work is not about politics—it's about grounding decisions in the best available evidence and empowering legislators from all backgrounds to champion science and make evidence-based decisions. Our communities deserve leadership that meets today's challenges with clarity, humility, and rigor. Science must be part of that equation.

CHAKAIA BOOKER, *The Host*, 2023, rubber tires, wood, and steel, 33 x 32 x 35 inches. Copyright of the artist and courtesy of David Nolan Gallery.

Senator Andrew Zwicker
New Jersey, 16th Legislative District