

# SCIENCE, TECHNOLOGY, AND VALUE

BY DAVID SCHMIDTZ\*

*Abstract: Technological innovations and scientific discoveries do not occur in a vacuum but instead leave us needing to reimagine what we thought we knew about the human condition.*

KEY WORDS: accountability, shaming, tribalism, Iron Age, monitoring, hubris, musical scale, Bach, descended larynx

## I.

Why is technology distrusted? Why wouldn't it be?

To the second question, one answer is that we have overwhelming reason to approve of technological progress even if we do not exactly trust it. After all, technology has added literally decades to our life expectancies. It has made humanity thousands of times more productive. Still, we may be standing on the edge of a cliff. We could have blown ourselves up in 1962, say, and today that remains a possibility. Today, few issues compete with climate change when it comes to casting global doubts on humanity's future. To many, it seems obvious that the reason why climate change is a problem in the first place is technology, combined with hubris. The petroleum industry dates back to 1859,<sup>1</sup> when kerosene emerged as a better, cheaper way to produce light than prevailing alternatives such as whale oil. Kerosene dominated until electric light became commercially viable in 1882. We did not yet know about greenhouse gases.

Today, the Environmental Protection Agency (EPA) estimates that a quarter of the greenhouse gases emitted in the United States are associated with generating electricity. Slightly more than a quarter of that output stems from fossil fuels used in transportation. Since 1990, the EPA also estimates that greenhouse gas emissions by U.S. industry have declined by 16 percent.<sup>2</sup> What is still rising, albeit slowly, is greenhouse gas emissions associated with transportation, notwithstanding steady gains in technologies of fuel efficiency.<sup>3</sup>

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<sup>1</sup> Source: <https://www.eia.gov/energyexplained/gasoline/history-of-gasoline.php>

<sup>2</sup> Source: <https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions>

<sup>3</sup> By contrast, levels of highly toxic lead have decreased dramatically since leaded gas was phased out.

Source: <https://www.epa.gov/lead-air-pollution>

doi:10.1017/S0265052522000012

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Suffice it to say, climate change is more than one thing, and geoengineering refers to more than one way of responding to climate change, to ocean acidification, and so on. Geoengineering holds out hope that, if all goes well, we will develop technologies of renewable energy, of carbon sequestration, of zero-emission refrigeration, technologies for reducing our reliance on carbon-based fuels, for reducing reliance on methane-generating livestock, and so on. Simply planting trees that metabolize carbon dioxide is a low-tech version of the idea. Other more high-tech versions of the idea aspire to get results rapidly and at scale.

Christopher Freiman worries that fear of the unknown leaves us not only giving the wrong answers but asking the wrong questions. We don't ask whether geoengineering poses less risk than the alternatives. We ask whether it poses *any* risk. (Consider our refusal to entertain the option of nuclear energy. Is nuclear energy unthinkable? Why don't we care how clean it is?) In a nutshell, as Freiman also notes, part of the problem is what geoengineering symbolizes. It symbolizes our willingness to subjugate nature. To many, geoengineering is a symbol of hubris, or of technology-worship. To some, it symbolizes humanity's unwillingness to do penance for sins of overconsumption.

Freiman, as I read him, thinks warnings against hubris often are warranted, but in this case, he finds the hubris objection unsustainable. Indeed, there is a whiff of hubris in the objection itself. There comes a time to accept with humble self-awareness that our best options are not without risk. Critics, perhaps rightly, tend to see geoengineering as a case in which we do not know enough to calculate risk. To Freiman, this may be a fair reason to hesitate about deployment, but it is not a reason to hesitate to at least explore our options.

As with geoengineering, Clark Wolf observes that gene-editing crop technologies pose a risk that increasingly is becoming attractive relative to known alternatives. Wolf notes how fear of the unknown shades into status quo bias. To be sure, it would be naïve to suppose we can anticipate all risks. We can do nothing of the sort. But what we can see is that not taking risks is not an option. Widespread use of generically toxic pesticides at the bottom of the food chain is a known and frightening risk. Gene-editing plants so that they can be gotten to your kitchen with less pesticide has already markedly reduced clear and present risks. To say we know the exact cost of reducing our reliance on toxic chemicals would be dishonest. But to Wolf and Freiman, the case for cautiously exploring these frontiers is manifest.

## II.

What counts as consent? Why would we see the consent of patients as important? When it comes to questions of medicine and deployment of

advancing medical technology in treating patients, it will be doctors who have the expertise; so, why consult patients?

A different question: What about experimental subjects? What makes it important to get the consent of subjects in *clinical trials*? Lynn A. Jansen explores blurred yet real differences between clinical care and clinical research that suggest a need for contextualized models of informed consent. The point, of course, is not to respect the *expertise* of patients and clinical subjects, but to respect their status as persons.

As Iskra Fileva points out, part of the problem with deploying expertise is that experts end up in areas that do not match their expertise. Epidemiologists are supposed to make decisions that turn out to require expertise in psychology, supply-chain management, accounting, fiscal policy, and so on. How is that supposed to turn out well? Epidemiologists, doing their jobs as conscientiously as they can, end up deciding questions of social policy, and while we may disagree with their decisions, we don't blame them for failing to obtain our consent. Why not? Experts may often be at fault for finding themselves in such situations, but not always. In any case, problems tend to be more than one thing, and tend to become more than one thing, to a point where real expertise must above all be about exhibiting enough self-command to recognize when a situation is evolving into something that requires a different kind of expert.

Fileva distinguishes between expert knowledge and expert opinion. The latter can be real, and can command respect, too, but we confuse it with expert knowledge at our peril. A true expert is acutely aware of the difference. This seems to suggest that expert knowledge implies a kind of maturity that allows an expert to stand back and let facts speak for themselves. To invoke a cliché, true experts, seeing that the problem is a nail, demand a hammer. By contrast, faux-experts start in the wrong place. Seeing that they have a hammer, faux-experts demand that the problem be seen as a nail.

In any event, when presumed experts contradict each other, nonexperts have to surmise, as per Fileva, that they are observing expert opinion rather than expert knowledge. Even if one of the dueling presumed experts truly knows, the difference can be hard to see. If one presumed expert self-represents as a swashbuckling virtuoso, while another seems painfully aware of his or her fallibility, we can guess from experience that the one who sees limits has become more adept at seeing the endlessly humbling details. That's a fair basis for guessing whose expertise is real and whose is mere appearance, but there are no guarantees.

One difference among experts has to do with knowing that observation underdetermines theory. For any set of data, there will be innumerable theoretical explanations that fit the data. Even if experts knew they had the best theory, they would still need to be humble enough to accept on the basis of experience that a better theory may be just around the corner.

To characterize dysfunctions of persuasive speech among dueling experts, Nathan Ballantyne borrows the idea of the "fog of war" and

reworks it as what he calls “fog of debate.” In some sense, the Internet brings us closer together, Ballantyne notes, but he worries that this does more to unite *tribes* than to make global humanity more cosmopolitan. That appearance of unity can make us less adept at seeing the merits of alternative perspectives. Of course, we see *the other* becoming less adept at understanding alternative perspectives, but the real problem is that seeing people as the *other* makes it harder to track what they are trying to say. So, when *others* see us becoming less adept, they are at least not mistaken about that. We are not adept at reacting charitably to being made to feel like the “other,” but that is what the fog of debate does.

As noted in a previous issue of *Social Philosophy and Policy* (vol. 37, no. 2) on “Freedom of Thought,” we have seen communication technology develop in the direction of facilitating tribalism rather than cosmopolitanism. Ballantyne notes in this volume, as Bambauer, Masconale, and Sepe did in “Freedom of Thought” that the problem may be as ancient as language: the primordial technology on which all other technology depends. Will newly emerging Internet technologies make the problem better or worse? This issue’s concluding essay by Grantham comes back to this idea of language as a technology.

Ballantyne notes that we want to treat persuading others by rational means as an ideal that guides philosophical debate. I’m not sure. Knowing what we know today about human psychology, we might instead say that the philosophical ideal is to somehow distance ourselves from the corruptions of confirmation bias. It is, however, hard to see how to do that without giving up on the idea that philosophy is about *winning*. (Imagine submitting an essay to a journal in which you begin by saying, “My thesis, to which sympathetic readers offer seemingly decisive objections, is that ....”) But if philosophy is not about winning, then perhaps it is not really about debate either. Perhaps a more philosophical ideal of philosophy would see Plato, and the best philosophers ever since, as simply trying to give readers something to think about.

It is hard not to notice how routinely we come away from a philosophical conversation with an acute awareness of the difference between (1) what we were trying to say, (2) what we actually said, and (3) what we wish we had been trying to say; that is, what we would have been trying to say had we known then what we know now. As Ballantyne explains, when entertaining an argument sketch, we “meta-reason” about the possibility of constructing more detailed arguments: we reason about what further reasoning we could do. This is how we expedite getting to our conclusion without bogging down or getting into regresses. If I give you an argument sketch, it is as if I give you an IOU. You can demand “payment” in the form of a filled-out argument. But typically uncharitable critical responses are disappointing. We lament that our critic fails to see how we were inviting readers to fill in what the critic identifies as a gap. If we see ourselves as swashbuckling virtuosos who have earned the right to have our argument sketches be given

the benefit of the doubt, we run afoul of critics who in turn imagine that it is they who are the swashbuckling virtuosos, imagining that their argument sketches are the ones entitled to be filled in charitably.

This is not to deny that debates can be worthwhile. Debates often do turn on hypotheses that genuinely are testable and accountable to observable evidence. The false ideal for a debater is to avoid testability. The true ideal is to have a thesis that is genuinely testable, even if that sometimes means learning that we lost, and that we now have an opportunity to learn, sort through the rubble, then move on with a more realistic perspective.

### III.

What if our ways of gathering information or making connections involve search algorithms? What if algorithms involve machine learning? What if a dumb algorithm has a better statistical record of correct diagnosis than a human expert? More puzzling, what if even programmers who design an algorithm cannot explain how it works? The issue of *Social Philosophy and Policy* (vol. 37, no. 2) on “Freedom of Thought” featured articles by Richard Sorabji and by Karim Nader on whether search algorithms represent a new kind of invasion of privacy. Deborah G. Johnson continues the conversation here by describing emerging issues of algorithmic accountability.

People or corporations are accountable, Johnson explains, just in case there is a forum in which they are obliged to explain and justify their actions, and in which they can be judged and sanctioned accordingly. So, Volkswagen, for example, may be accountable to a board of directors, regulatory agencies, employees, and customers for decisions regarding emissions standards. People who once acted with impunity can be shocked to realize that they are indeed accountable, and that it was never their prerogative to make *that* decision in *that* way. All too often, we read a news story and wonder, “What were they thinking?” Moreover, accountability can be an intricate interplay among multiple agents subject to multiple norms. If a bridge fails, investigators are left to ask: Who designed the bridge? Who selected that designer? Who selected that location? Who specified how much traffic the bridge should be able to handle? Which other person subsequently decided how much traffic the bridge would in fact handle?

Agents can be surprised to realize that they are accountable for failing to hold other agents accountable for making sure their sequential inputs add up properly. When someone blows the whistle, everyone involved, including the whistle-blower, can be amazed to be in that position—amazed that the people being scrutinized did not anticipate being held accountable and did not deem it a top priority to have nothing to hide. Disagreements about who is responsible to whom for what can, as Johnson notes, indicate the emergence of accountability practices. And so it is with algorithmic accountability. Who is to be held accountable, and for what? Algorithms are tools,

put to use in a given way as an emerging result of an interplay between creators and users. In some way, algorithmic accountability must be ascribed to those players, for that interplay.

A related perspective on accountability, and on the technology of holding people accountable, emerges from Harrison Frye's reflection on public shaming. A white woman assaults a black teenager, accusing the teenager of stealing her iPhone. The scene is recorded. An Uber driver then returns the phone, which the woman had left in the driver's car. Her apology is not recorded on video but in the transcript sounds grudging, insincere, and immature. When the video gets uploaded, a world of faceless and unaccountable hate rushes to judgment against her. (Anyone who watches the video will find it hard to muster any sympathy for her.) So, what does it mean? Did we accidentally abandon having a right to confront our accuser?

As Frye notes, trial by jury conventionally starts from a baseline of presumed innocence, whereas trial in the court of public opinion starts from a baseline of presumed guilt. We get recruited to sign petitions condemning someone for some transgression, and it is not as if twelve jurors deliberated and worked toward a consensus that a defendant was guilty. Rather, thousands upon thousands of people are treated as rabble to be roused by spammers. Then, once a dozen people prove sufficiently gullible or hysterical to sign (because of whatever else is going on in their lives at the moment, including whatever other appalling news stories they've been streaming that day), then you have a petition signed by a tiny distracted minority who are then presented as if they were a jury of peers coming to a soberly deliberate consensus. Someone's life and career is shattered for what may or may not be good cause. As Frye observes, there are too many cases (unlike the example with which Frye begins) where we suspect that the person is guilty, but all we really know is that someone, wanting to feel good about his or her power to vandalize, chose that as an occasion to lash out. Today's social media are empowering genuine victims, but also encouraging mob psychology.

Sally Stevens offers yet another perspective on how accountability can be transformed by technology. Youths are accountable to society for their behavior, and society is responsible for making sure that the practices and policies of its juvenile justice system are in the best interest of its youths. Current technology can make the monitoring of minors involved in the justice system both more affordable and less intrusive. Monitoring by ankle bracelets with GPS tracking, drug and alcohol testing, and voice verification systems sound awful, but compared to being incarcerated, the technology offers a way to get on with living a life. Still, the invasion of privacy is real, and current technology is imperfect. If such things elevate stress in some youths, or elevate stress for potential friends, employers, customers, and so on, that probably is not conducive to rehabilitating or to helping youths to

get a feel for the rewards of living a normal life. That is to say, the imperfections of the technology are not merely technological in nature.

Is technology an equalizer? Intuitively, it could be, and at times has been. To give an ancient example (see George Grantham's essay), the Bronze Age was one in which metal was widely available only to the ruling class. Ordinary peasants still used tools made of stone. The Iron Age began in the twelfth century BCE, and it was revolutionary. The trouble with iron is that a smith needs higher temperatures and more expertise to smelt iron. But bronze became more expensive as one of the alloy's ingredients, tin, became scarcer; so people were driven to find a workable iron smelting process, and iron tools subsequently became cheap. Thus, as rich people were switching to iron from bronze tools, poor people were switching to iron from stone tools. The Iron Age lifted the rich out of the Bronze Age even while lifting the poor out of the Stone Age. Safe and cost-effective iron-smelting technology was simultaneously one of history's great liberators and great levelers.<sup>4</sup>

Closer to home, and closer to the topic of Colleen Murphy's essay, in the 1830s, steam-powered presses made possible the emergence of one-cent newspapers as an alternative to the then standard six-cent newspapers. New audiences began to emerge, and thus new kinds of news as well, including daily news financed more by advertising than by expensive subscription. Pages became less editorial and more objective, because even-handedness was the path to a broader appeal. A newspaper could aspire to be an information source for a whole city rather than for a particular demographic. *The New York Daily Times* launched in 1851, changing its name to *New York Times* in 1857.

The registering of collective memory thus has been a technological challenge for a long time. Colleen Murphy connects this to the topic of transitional justice. One of the goals of transitional justice, Murphy notes, is to create a historical record that can become the basis for a shared collective memory of conflict and repression. But Murphy observes that the form of record created, and therefore the kind of collective memory shared, can be shaped by the recording technology. Moreover, if technology marginalizes, that becomes its own problem. A cell phone, for example, is not much of a tool for someone who lacks the required knowledge or technological infrastructure. So, Murphy observes, when a historical record relies upon technology to which not all have similar access, it can lead to distortion. Her closing thought is that technology has the potential to reduce the monopoly a state may otherwise have over the production and dissemination of information, but the potential is likewise there to enhance a state's ability to monitor its citizens.

<sup>4</sup> David Schmitz and Jason Brennan, *A Brief History of Liberty* (Hoboken, NJ: Wiley-Blackwell, 2010), 40.

## IV.

Returning to the topic of hubris, one theme emerging from the work of celebrated urban activist Jane Jacobs is that technology is not everything, and technologists who do not understand how technology has to fit in are incompetent as technologists. Jacobs became famous for her grassroots opposition to plans being drawn up for a Lower Manhattan Expressway that ignored the project's foreseeable impact on Greenwich Village. Jacobs can be read as a warning against the hubris of central planners who don't see (or who are antagonistic to) the point of organic communities. The incompleteness of our information base can be a friend of community rather than an enemy needing to be surmounted from the top down. Real, current information emerges from the bottom up. Like Jacobs, Sanford Ikeda speaks of the unseen values. He takes to heart Jacobs's warning that something as seemingly inconsequential as widening a city street can undermine the street's role in fostering social connections that make a neighborhood safe. Securing the right to say "no" to other people, including strangers, frees people to take the risk of heading out into the streets, more than willing to meet strangers, in search of "yes." Part of the difference between great cities and more rural environments has to do with the sheer number of people brought together by a great city. However, in the same way that inflation is a product not of the amount of money in existence so much as the amount in circulation, the vitality of a great city is a function not of people per se but of people in circulation. "Jacobs argues that in a great city in which on any given day the vast majority of contacts and informal interactions we have are with strangers, feeling safe and secure among them is paramount." In a village, there are no oral surgeons. There are no violin manufacturers. These professions emerge in great cities because that is where customer bases are capable of supporting such fine-grained specializations. But you have to be able to trust strangers. You have to be able to trust them to deliver as promised. They have to be able to create reputations for themselves, where the information encoded in the reputations is itself trustworthy, and that in itself embodies a whole different world of being able to trust the strangers whose feedback constitutes a reputation. It is because of this that great cities are the frontiers of human creativity.

The proper goal of urban planning is not to achieve a visionary outcome, and not to have a vision of what people are for. The proper goal is to put people in a position to figure that out for themselves—individually, spontaneously, and creatively—and to develop an alertness all their own to opportunities to be of service. People are not pieces on a chessboard, Adam Smith observed. They come to any plan with destinations of their own, so any city plan must aim to be a live process rather than a dead outcome. A good plan makes innovators feel at home. In other words, a community's traffic management scheme cannot be designed with a "correct" destination in mind. Let people be each other's repository of local wisdom. Let people



learn from each other what it takes to be a considerate neighbor and valued producer.

## V.

We close this issue with three essays on art, morality, and language as humanity's primordial technologies. These were technologies we used to become human. Daniel Asia and Robert Edward Gordon discuss technological advances in the production of musical instruments, along with technical developments of musical notation and musical scale, which made orchestras possible, and which provided a setting for experiments such as Bach's *Well-Tempered Clavier*. They consider images of technology such as Jan van Eyck's *Arnolfini Portrait* and works such as *Earthrise* that exalt humanity by virtue of embodying spectacular triumphs of technology.

Allen Buchanan likens morality to a technology as well—and plausibly so. Among other things, and in conjunction with the rule of law and culture more generally, morality is one of our most primordially indispensable devices for managing the traffic of human communities. As a tool for enabling people to secure some sense of knowing what to expect from each other, it is a technology par excellence. As Buchanan observes, much of what we call morality today is somewhat of a luxury by comparison with the original from which modernity's morality descends. The problem, Buchanan suggests, was never to get back to an egalitarian golden age, but to achieve and stabilize victory over all-too-real brutalities of class-based hierarchy. Buchanan thus gives us a way of concretizing Bernard Williams's notorious remark that the first institutional question concerns not justice but “the securing of order, protection, safety, trust, and the conditions of cooperation. It is ‘first’ because solving it is the condition of solving, indeed posing, any others.”<sup>5</sup> Historically, progress begins with making it safe for us to be neighbors. Being neighbors is, before anything else, about knowing where the boundaries are and respecting them. That isn't everything, but it's a start. Note that, contra some interpreters, Williams does not say peace is *more important* than justice. When he says peace needs to come first, he means literally first. In other words, justice is an achievement. It certainly goes beyond managing conflict, but the point is that to achieve justice at all, we have to first manage conflict well enough to give justice a *chance* to go beyond it.

Communication technology likewise is a fundamental technology, and the most fundamental communication technology of all surely is language itself. Written language is a later, but similarly momentous, development, as is the closely related concept of money. (Many of our earliest records of written language are accounting records.) When Jason Brennan and I were

<sup>5</sup> Bernard Williams, *In the Beginning Was the Deed: Realism and Moralism in Political Argument*, ed. Geoffrey Hawthorn (Princeton, NJ: Princeton University Press, 2005), 3.

preparing a *Brief History of Liberty* (2010), we discussed George Grantham's amazing essay on developments such as the evolution of vocal cords as keys to the emergence of humanity in its modern form. That essay appeared as a working paper in 2008, but was never formally published. We are happy to remedy that oversight by publishing Grantham's essay to close this issue.

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