



“They Made Up Quiet Songs”: Classification, Feeling, and Technique in Science and Religion

Donovan O. Schaefer, Associate Professor of Religious Studies, University of Pennsylvania, Philadelphia, USA, doschaef@upenn.edu

In this rejoinder for the Book Symposium on *Wild Experiment*, I consider several themes that recurred across the five responses. These themes are: the way we classify and morally position science, religion, and secularity; the relationship between scientific rationality and its others; the roles of scientific emotions in scientific training; and the relationship between the cool or calm cognitive emotions and scientific practice.



Introduction

Receiving the Ludwik Fleck and International Society for Science and Religion prizes for *Wild Experiment* has been one of the greatest honors of my career. And I am humbled by the rich, detailed, and imaginative responses to the book offered by Mathew Arthur, Anne Pollock, Josh Reeves, Esha Shah, and Mari van Emmerik in this Book Symposium. This book was driven by my conviction that although plenty of work on the affective life of science existed, that research was happening in disparate corners of the academy. Those corners, I believed, could be brought together to help spark the conversation that science studies in all its forms—including science and religion—needs to be having about the nature of knowledge-production. So I am grateful for five conversation partners who have so expertly staged exactly the kinds of dialogue I hoped I would get to participate in after writing this book. It is a true pleasure to be allowed to explore new horizons in science and religion—as well as science studies more broadly—in such excellent company.

Several themes recurred across the five responses in this symposium, and I would like to reply to those themes in turn, rather than pivoting from one discussant to the next. (With apologies, this means that for lack of space I will not be able to engage every single agenda item raised in these fabulously interesting responses.) These themes are: the way we classify and morally position science, religion, and secularity; the relationship between scientific rationality and its others; the roles of scientific emotions in scientific training; and the relationship between the *cool* or *calm* cognitive emotions and scientific practice.

“The Great Advantage of Neutrality”: Classifying and Moralizing Religion and Science

One of the recurring motifs of this dialogue was the question of how to classify—and evaluate—the categories of religion, science, and the secular. Coming from religious studies, it is widely acknowledged that the category *religion* needs to be studied at arm’s length—not as an essential feature of reality but as a contingent classification. The ongoing historicization of the category of religion shows that the definition of religion is always a process rather than a consistent arrangement (McCutcheon 2003; Smith 2004; Masuzawa 2005, Nongbri 2013). Religion is deployed for different purposes, in different assemblages and with different elements, in different moments in history. Brent Nongbri (2013, 155) proposes that one of the defining questions of religious studies should be:

What sorts of interests are involved in such decisions of defining religion? *Who* is doing the defining and *why*? In other words, a good focus for those who would study “religion” in the modern day is keeping a close eye on the *activity* of defining religion and the *act* of saying that some things are “religious” and others are not.

Science, too, has enjoyed its fair share of critical reframing in the past century. Paul Feyerabend's (1993, 1) assertion that "*the events, procedures and results that constitute the sciences have no common structure; there are no elements that occur in every scientific investigation but are missing elsewhere*" has widespread acceptance in science studies.¹

I start to fret, then, when I read a passage like this one, by Mathew Arthur (Arthur 2024, 790–91):

For both science and religion, change is at the mercy of histories already composed and in process. Both are guilty of methods that uproot situated stories and put them to work reproducing more of the same.

It is not that I disagree with the overall sentiment here: the things we call *religion* and *science* are definitely historical and definitely need to be met with a range of critical reactions. It is the syntax I wonder about. *Religion*—in the singular? *Science*—in the singular? As if either of these vast, polymorphous worlds could really be localized to a single domain? That worries me.

To be clear, though: I do not think Arthur believes that science is so monolithic as it sometimes comes across. His wonderful book *Everything Is a Lab* is introduced with the observation that "the bubbling-up of yeasty dough, the soft or hard coordination of lover's bodies, the same old house in freak weather or the glow of dusk light [is] each time a new technology" (Arthur 2023, ix). I cannot recommend this brief volume strongly enough—it is beautiful, bold, and hugely generative. We are on the same page, I think, that technology and science and their many offspring spill everywhere. But I want to use Arthur's piece to draw out some tendencies that I find operating in a number of domains in the humanities, and are refracted in some ways even in this symposium—in particular, a tendency to see science as a cohesive intellectual object that can be assessed as innocent or guilty. Science, I would say, is not localizable to one time and place, nor is it reducible to a single moral valence. It is woven into violence, exploitation, and oppression just as it is woven into peace, justice, and flourishing.

For decades, science and religion scholarship has pointed to a powerful consensus that the science/religion binary needs to be dissolved. As Peter Harrison (2015, 3f) writes, "the compartmentalization of modern Western culture that gave rise to these distinct notions 'science' and 'religion' resulted not from a rational or dispassionate consideration of how to divide cultural life along natural fracture lines, but to a significant degree has been to do with political power—broadly conceived—and the accidents of history." Studies of science and religion, at their best, offer a powerful rejoinder to the constant pressure of conventional wisdom—the basically modern ideology that sees science and religion as antonyms (Brooke 1991; Harrison 2015; McGrath 2019; Midgley 2002).

Some might say that as Euro-modern categories, *science* and *religion* can be aptly applied in those times and places—the contexts of emergence of the terms themselves. But that does not go far enough. Even in their initial moment of imagining, the categories of science and religion were not up to the task. What does it mean to split science and religion when the medieval European universities were mostly religious foundations? Or when Isaac Newton and Johannes Kepler were cross-cutting astronomy and scriptural commentary? Or when Darwinism was met with sincere embrace from some religious believers and devout rejection from some men of science? (Brooke 1991) The most important topos we can bring into any conversation about science and religion is, first and foremost, a rejection of the science/religion binary.

So, too, with the secular. Arthur writes that he “live[s] in one of the most secular cities in Canada,” and then paints a textured portrait of Vancouver as “gridded with Teslas at EV charging stations, yogawear retailers, and lush greenspaces” while also struggling with homelessness, drug addiction, and stark economic inequality (Arthur 2024, 792). I was born in that same city in Canada, and I want to take friendly issue with Arthur’s characterization of it as secular. Not because it is churchy—definitely not (see Block 2016; Todd 2022). But the lesson of secularism studies is that we cannot draw a firm line around *the secular* and invincibly wall it off from *the religious*. Mari van Emmerik (drawing on scholars like Christopher Cotter and Lois Lee) phrases this deftly in her response in this symposium. She challenges the “reification of religion” by which lights the secular is wanly defined as the blank tableau left over when religion withdraws: “from this perspective, religion-related phenomena are treated as something ‘charged’ and substantial, while any nonreligion-related phenomena are relegated to the ‘neutral’ space empty of religion” (van Emmerik 2024; see also Lee 2015).

Vancouver is an instructive case study for studying exactly why the category of *the secular* is so mercurial. So yes: a panorama of green-forward urban planning and gleaming condo towers and pop-up VC firms in skyscrapers and cryptocurrency vending machines in corner stores. But also: a city where colorful prayer flags hang in windows, Buddha statues smile from garden plots, a towering statue of Lord Krishna rises in the distance from Marine Drive, and psychedelic designs proliferate on posters and wall hangings; a city where a vivid, shapeshifting landscape of new religious movements, transnational cultural exchanges, and New Age efflorescence inspired me to study religion in the first place.

I think secularism studies goes even further in showing us that even things that don’t even try to correspond to the historic labels of religious and secular end up blurring the lines between the two. So we could ask of planetary consciousness, psychedelica, or the yogafication of exercise: religious or secular? The churches may be in retreat, but all kinds of new fixations, new disciplines, new utopian projections, new articles of faith crop up in their wake. So too with that eminently Vancouverite construct: spiritual but not religious. The

clamor of conventional wisdom places spirituality as the binary opposite of religion—washed clean of power, absolved of institutionality, timeless rather than wedded to history. But as Linda Mercadante (2014, 235) writes, “rather than secularization or the ‘death of God,’ we may be seeing a shift in the location of the spiritual instinct.” Secular people may begin by careening in the opposite direction of religion, but they often find themselves traveling full circle before slowly coming to rest right next to the place they left. This “secular paradox,” as Joseph Blankholm (2022, 5) puts it, is “the weirdness of being secular.”

I am taking this definitional detour because I think it has serious consequences for the way we imagine the relationship between science and power. I am exceptionally grateful to Arthur for sharing his familiarity with Indigenous STS—and Indigenous thought more broadly—in this space. One of the vibrant pleasures of reading his piece was learning with him from these approaches. His response, as I take it, is about challenging the innocence of science, about showing that science is not as neutral—epistemologically or morally—as it is sometimes held up to be: “The question remains,” he asks, “of how to run with the claim that ‘thinking feels’ while accounting for science’s bad side effects: lab rats, addictive pills, shitty bedside manner, racist algorithms, nuclear weapons, Elon Musk’s plans to colonize Mars” (Arthur 2024, 797). So true, and Arthur is right that by centering the contrast with conspiracy theory, I may have painted science with an optimistic sheen in the first half of *Wild Experiment* (before the stark criticisms I make of race science, eugenics, and sociobiology in the second half). This was, I suppose, motivated by my concern over what I see as a pervasive reflex in some quarters of the humanities to swiftly lapse into moralism around science. It looks to me like the calcified residue of some kind of Weberian grammar, by which science is automatically bad, automatically guilty, automatically in hock to oppression, exploitation, colonialism, capital, and alienation.

There was more I wanted to say—about lab rats, about race science, about Silicon Valley sadists. It ended up on the cutting-room floor, as does so much with books that try to say too much. Some of it wound up in my later article “Voracious Secularism: Emotional Habitus and the Desire for Knowledge in Animal Experimentation,” which expressly considered how the pleasure aspect of science is exactly what locks in violent dimensions of scientific inquiry (Schaefer 2023). That piece began with the work of two early-twentieth-century suffragettes, also anti-vivisection activists, who attended a lecture in London where a professor of medicine carved up a living dog on an operating table for the benefit of a room of students. But rather than the “serene dignity of science,” the women described how “there is a spirit of jocularly prevailing, a loud conversation is going on, jokes and laughter everywhere” as the animal slowly died at the center of the theater of learning (Lind af Hageby and Soharta 1903, 20f). The pleasure dimension I draw out of science through the epistemology of *click* was never intended to render science angelic.

So I am in full agreement that we cannot indulge in a portrayal of science as innocent. But I think in the process of making this point, Arthur goes too far toward isolating science and secularity as discrete intellectual artifacts with distinct moral valences. And I sense that part of Arthur's critique of *Wild Experiment* is exactly a concern for locating the innocence—or guilt—of science. He attributes the Vancouver landscape to “the ‘great advantage of neutrality’ . . . that evidence-based joins of science and democracy are said to provide” (Arthur 2024, 793). He docks me for working with “neuroscience and experimental psychology in order to prove that cognition includes emotion” (Arthur 2024, 794). He expresses concern over whether “science’s stamp of approval [on animist cosmologies is] just another colonial gesture?” (Arthur 2024, 794). And he takes to task my assertion that it is important for humanities scholars to stay in touch with the natural sciences, noting:

In a world already conscripted by technoscience with mortal stakes—life-saving drugs, agricultures of scale, labor automations, climate mitigations—this might hold true. But when science and the state are ontologically aligned, how are we to index or account for subversive forms of racialized reason embedded in “evidence-based” governance? How can we adjudicate feelings of truth in conspiracy versus, say, Indigenous lifeways that answer the question “who gets to be a person” (Wilkinson 2017) with rivers, rocks, and trees or Chinese medical syncretisms that cure depression with needles and bitter herbs that move invisible Qi? (Arthur 2024, 793)

To affirm the non-innocence of science, we also need to have a sense of strict bounding lines around *the* religion, *the* science, *the* secular. This authorizes the antithesis of technoscience-secular-state against traditional-religious-nonwestern. It dispenses with the lability of the categories—and renders them conspicuously well-suited to a tidy morality tale.

And this is where I want to offer a respectful rejoinder to Arthur's framing. We are not, it seems to me, “conscripted by technoscience.” We are conscripted by capital. And capital (itself a highly polymorphous conglomerate of power-knowledge-affect, and maybe ultimately not a very useful term) will ruthlessly carve up whatever it wants, however it wants. Real conscription by technoscience would look very different. It would mean state actors taking climate change far, far more seriously than they do. Conscription by technoscience would mean the blanket rejection of policy-making that is oblivious to long histories of racialization—given the abundant scientific consensus that those histories matter in the ongoing unfolding of the present. Conscription by technoscience would mean sweeping transformations of food systems, energy, transit, health, and labor. Science's voice does not have the command that I think is being attributed to it here. And to forget the fluidity of science—and the pervasiveness

of science as something that belongs to everyone—seriously damages our capacity to name and respond to the real problems facing us.

Similarly, I am not convinced science is as invested in envisioning personhood in ways that are hostile to Indigenous or nonwestern perspectives. Arthur (2024, 795) writes that “the sciences have been hell-bent on pathologizing those who talk to trees and rocks.” But in my view, that is just not what scientists tend to do in the daily work of science.² I know Galileo’s (1957, 186) division of science and religion into *how the heavens go* and *how to go to heaven*—reaffirmed 400 years later by Stephen Jay Gould (1999, 6) in his non-overlapping magisteria paradigm—is not quite right. Facts and values, evidence and morality, cannot be so neatly compartmentalized. The interdigitations of what gets (and has been) called science and religion are too deep, too uncountable to cleave them into such tidy domains, even as a regulative ideal. But still: it is misguided to fetter science to a comprehensive view of personhood that I think few working scientists would claim as their own.

On the other side of the equation, I worry about the reflexive affiliation of, for instance, qi medicine and acupuncture with something inherently progressive or liberatory, some gentle fledgling in need of protection from the predations of science. This would seem to overlook the way that the Chinese state actively promotes the superiority of traditional Chinese medicine over so-called *western* medicine as part of an authoritarian, nationalist project (Yuan 2024). As a qi-based martial arts practitioner (another legacy of my not-quite-secular Vancouver youth), I have long been fascinated by the way the usually soft and squishy image of, say, Aikido quickly mutates when you start looking at the roots of the martial arts revival in pre-war Japan’s escalating agenda of imperialism-cum-fascism. In my experience, qi/ki is deeply embedded in frames of power, violence, and hierarchy (Bodiford 2010; Mangan and Komegome 1999). This is where the rubber hits the road with trying to pin moral stakes on the science and religion binary. As an analytic lens, it obscures the far more sweeping, far more heterogeneous entanglements of science, religion, and secularity that define the transverse field of power-knowledge-affect. “Innocence,” as Donna Haraway (1991, 157) writes, “has done enough damage.”

Arthur (2024, 793–94) writes “[l]ike Western science, these knowledge practices have their own in-built agonisms or self-correcting checkpoints for appraising the ‘felt weight of facts’ (Schaefer 2022, 9).” The sudden slip from science to Western science in this passage is telling. It is exactly because I do not see science as an exclusively Western prerogative that I am not interested in a simplistic definition of science as univocally moral or immoral. I see science as our embodied orientation to understanding the worlds enfolding us. I see it as part and parcel of animal being-in-the-world, therefore entangled with many different forms of power and resistance, many different thoughts and actions, many different value systems. On some level, I see science as essentially neutral—precisely because it is so foundational to our existence that it is

indissociable from thought itself. My argument is just that we cannot understand knowledge-making processes without paying attention to feeling, and feeling has not been attended to nearly enough. We definitely cannot understand the relationship between science and power without looking into how feeling welds them together. The quickest way to misunderstand science is to isolate it as a morally simplex object. Guilt and innocence are the least interesting verdicts to offer.

I am looking at the frontispiece of my copy of Chanda Prescod-Weinstein's *The Disordered Cosmos* (2021), her memoir of life as a Black theoretical physicist. It is a sketch made by artist Shanequa Gay of her painting *We Were Always Scientists*, and it shows two Black women, working at a table, with liquids, glassware, and a mixing bowl in front of them, their hair wrapped in scarves, pieces of cloth hanging on a line behind them. One woman is holding two implements for liquid transfer, maybe a beaker and a dropper, and her face is the focal point of the image: her brow furrowed in deep concentration, that unmistakable expression of the feeling of doing science.³ And I take this to be one of the themes of the book, that science does not just belong to Euro-modernity, to men, to the wealthy, to the formally educated. Science—the careful study and refinement of our interactions with our environment—must be fully depedestaled, fully democratized, fully realized as part of how we all interact with our worlds.

The Purity of Science

Esha Shah's response comes at this same question from the other direction. Like Arthur, she wants to insist on a distinct profile of science as a discrete category. Unlike Arthur, she holds to this as a quality that defines the virtue of science: its capacity to hold itself above the fray of prejudice-laden jingoism, kneejerk conspiracism, and every variety of social media sludge. So I will reassert, as well, my basic argument for why science needs to be depedestaled. All modalities of knowledge-production are formalized to varying extents; science (as an ideal type) tunes itself as best it can to a more formalized process, matching, knowingly or not, the emotional blueprint I have laid out here—and doing so through the whole ensemble of training procedures scientists use to make more scientists. But I would add that formalized processes are happening everywhere. Every conversation, every exchange, every ad hoc process of trial and error is a study, a probing, a refinement. Even conspiracists debate better and worse ways to weave exhilarating delusions about the way the world works. And even the best scientists can succumb to groupthink, prejudice, lapses in judgment. Everything, as Arthur (2023) says elsewhere, is a lab.

I agree with Shah that the processes of institutional science make it more amenable to various forms of counter, dispute, and improvement. That is why we can resoundingly endorse the climate change consensus, or the validity of vaccines, or the literature on the damaging effects of racial discrimination, or a

previous generation of scientists' findings about acid rain, second-hand smoke, and ozone-depleting aerosols (Oreskes and Conway 2010). But I do not quite buy that formalized, institutionalized science and non-science are reducible to the binary between open and prejudiced. That does not take our everyday modalities of learning about the world seriously enough. And it risks draining the reservoir of humility that science needs to keep on hand at all times to maintain exactly the intellectual liquidity—"the possibility that science can be systematically contested, challenged and reformed, [so] it can be called on to be responsible and accountable" (Shah 2024, 837)—that Shah and I both see as indispensable.

This is also where Shah injects an important line of inquiry about contamination in the book. She notes—rightly—that this term activates an implication that science "was pure and then it got mixed up with bad stuff" (Shah 2024, 831). I remember tapping out the word *contamination* and knowing it was going to get me into hot water at some point, but I stuck with it. And I guess that is because somewhere in the back of my mind, I am holding to the prospect of a regulative ideal of science—a vanishing point on the horizon, a model for doing science that most effectively integrates and synthesizes the many intellectual affects that enfold the scientific knowledge-making process. (Click is one such emotion, but by no means the only one.) This is what I call *the sense of science*—a dynamic of intellectual affects.

So contamination does not mean *emotion gets into scientific rationality and messes it up*. It means *the emotional chemistry of the sense of science gets thrown out of whack and the wrong emotions are put in control*. All kinds of scientific malpractice—from bio-racism (Fields and Fields 2014, 4) to research fraud to academic bullying to groupthink to *p*-hacking—can be lined up with this. The wrong things start to matter—wrong from the stance of the regulative ideal of science—and I do not think it is wrong to call that contamination, as long as we are clear that *emotion gets into science* is not the mode of contamination we are talking about. Right or wrong, science is emotional.

Reeves, too, sounds off on this topic, noting that "*Wild Experiment* attributes a primary role to pleasure" via *click* and asking: "is the pursuit of pleasure inherently selfish, tied to personal prestige and status? . . . Is there a convergence between what is pleasurable and what is good, or is the pursuit of science always an extension of self-interest?" (Reeves 2024, 821). It is a compelling point. Fundamentally, I see pleasure as multiple, and science as oriented toward the pursuit of many different pleasures, in different degrees and kinds. Most importantly, scientific endeavor is not just about a pleasure we might take from beating out scientific rivals, getting a promotion, or earning a living. There is pleasure inside the very practice of working with ideas. And that pleasure messes together with all the other pleasures that go along with the scientific life. There are ways of training scientific intuitions—cultivating pleasures, what Monique Scheer (2012) calls *emotional habitus*—that really do matter for the doing of science.

That is a regulative ideal, though—a Weberian ideal type—not a real scientist. No real scientist is an exact compound of that formula. So I agree entirely with Shah's (2024, 833) rejoinder: the knowledge-seeker is “a self that is not only a fundamentally feeling, suffering, experiencing affective self but most importantly, this self is incoherent, contradictory, heterogeneous, split between the conscious and unconscious, both fictional and real at the same time.” When Darwin was pre-empted by Alfred Russel Wallace in publishing the theory of evolution by natural selection, he immediately launched a conspiracy with his friends at the Linnean Society to get his own version on the record before Wallace's priority could be established. “It is miserable in me to care at all about priority,” he wrote, shamefacedly, to one of his associates at the time (Darwin 1858; cf. Schaefer 2022, 144). But that did not stop him.

That kind of scientific ambition is indissociable from academic life, I believe. But it is also liable to contaminate the regulative ideal—the virtual horizon point on the highway that we will never reach, but that we can all benefit from holding in front of our field of vision—of the sense of science. I think Shah and I are on the same page here. Science is feeling all the way down; we hold the same bow-string, drawn all the way back.

Scientific Emotions, Social Emotions

While Shah insists that I am spreading science around too much, Reeves argues that I am not allowing it enough breathing room, suggesting that I see conspiracists and scientists as existing in two tidily discrete containers. I am going to push back on this characterization of my argument, though. It is precisely because I do not think scientists and conspiracists can be so easily siloed that I talk about them together. Reeves (2024, 816) writes that “scientists, like anyone else, are susceptible to confirmation bias.” Definitely. I would never say that scientists have perfected the schema of emotional prioritization of *science* as an ideal type. I cite feminist critics who have dubbed the tendency of scientists to confirm their own ideological priorities (or to find answers that consolidate their careers) the Mulder effect to help make this point (Schaefer 2024, 8; see also Jordan-Young and Karzakis 2019). I wrote in Chapter 1: “Just as conspiracy theories can never really be disproven (and sometimes contain flashes of truth), there is no mechanism within science for manufacturing certainty, only a carefully constructed arena for staging the contest of forces” (Schaefer 2022, 54). But I also think that intellectual tendencies defining the two camps (such as they are), help to explain the real divergence between them, and I think those intellectual tendencies are best characterized in terms of feeling.

On the other side of the table, Reeves wants to attribute a science-like epistemic vigilance to non-scientists. Here too we are in complete agreement. But I want to stress that epistemic vigilance is not just an on-off switch. It is a complex set of intellectual tendencies—tendencies which can be cultivated through scientific training. And the best way to understand epistemic vigilance,

I think, is by thinking of it as fully enmeshed in emotion—not separate from it. This is where I want to try to reconnect with exactly what I think Reeves is sketching out. Reeves’s picture of science is my understanding of science but with a different explanatory frame. For instance, Reeves (2024, 817) writes that “‘Tribal rationality,’ from this perspective, is not an illogical tendency to believe whatever your superiors tell you but is rather a useful shortcut that relieves one of the cognitive burdens of having to assess someone’s trustworthiness.” But what does that mean—relieving the cognitive burden of trustworthiness? What is a cognitive burden? My argument is that what we are really talking about here is an affective modality, an intransigent, deeply felt sense of frustration that comes along with having to uproot an existing way of thinking.

This, in other words, is the affective topography of rationality itself. Reasoning is not a computational system that automatically pathfinds a maximally efficient route. It is guided by feeling. We find easily navigable terrain here—ideas that click together effortlessly, right or wrong—and rough patches here—ideas that challenge, disrupt, frustrate, agonize—as we fumble our way forward. And that topography of resistances and openings is shaped by the emotional infrastructure of rationality. Reeves (2024, 817) actually reaffirms this in his next sentence, noting that “Many conspiracy theorists are driven not by the allure of ‘click,’ but by the desire to avoid work, which, like physical labor, can be unpleasant.” I agree! What we are talking about is exactly a reframing of knowledge-making as a dynamic of desire and pleasure—and even pleasures. The point is that the arena in which this agonism of forces plays out is affective, rather than computational.

Reeves’s (2024, 818) model is connected to the sociological account of science as optimally understood in terms of its sociality: “Given the limits individuals encounter in seeking truth,” he writes, “we in modern societies solve the problem of distinguishing good from bad information by forming institutions and collectively practicing intellectual vigilance through the structured contestation and deliberation of different points of view.” I do not disagree with this exactly. But I think it is an insufficiently detailed account. The bundle of interpersonal dynamics we collectively identify as the sociality of science is more precisely defined as an ensemble of affective processes.

Reeves (2024, 818), for instance, writes that “Scholars are motivated to expose subpar scholarship and to remain open to innovative and potentially groundbreaking theories, understanding that overlooking such theories could place them at a competitive disadvantage.” Sure. But why are some people motivated by concern over “competitive disadvantage”? Why do some scientists want to join the herd? And why do others stick their necks out for a hunch? The nature of that motivation is a conglomerate of social emotions: shame and competitiveness, most prominently. To point to sociality as the explanatory terminus for the motivational structure of science is, in my view,

to step backwards, from a more unpacked explanation (social affects) to a less unpacked one (sociality, as such).

Nor is that the only thing that motivates scholars. This is a feature of my argument that I think Reeves has ignored: click is its own motivating force, its own locus of pleasure. Reeves (2024, 818) contends that “mutual oversight ensures that only competent scholarship is advanced, thereby enhancing the discipline’s social authority.” We know perfectly well that the history of scholarship is not a history of perfectly lineal forward motion. Click is both a powerful driver to better understand the world—shattering orthodoxies as new data grates on existing paradigms—and a profoundly conservative force, as the dominant paradigms demand fealty, locking in affectively charged patterns of interpretation that make new ideas impossible. Besides, the social emotions also exert their own retrograde vectors of force—as rivalries, jealousies, and ambition drive scholars to falsify or misinterpret their own work, consciously or otherwise.

And then there is science in solitude. Click is an exorbitantly powerful emotion. It can be coassembled with all kinds of social affects. But it can also be experienced on a desert island. Reeves (2024) suggests that there are far more scientific emotions in play than just click, a sentiment I think tracks with my definition of the *sense of science* as “a permanent struggle between the excitement of click and countervailing pressures—like fear or shame—about getting things wrong” (Schaefer 2022, 23f). There are many affective strands braided together in the sense of science—and the social emotions are vital elements of that braid. But not the whole story.

Anne Pollock makes a rhyming point with her request to return to the category of the erotic in conceptualizing science. For her, the erotic is another trope of sociality or relationality: a real connection rather than the predatory domination of some scientific practice. She introduces Evelyn Fox Keller’s sense of the word; for her “the erotic is figured as a longing for a more relational and reciprocal way of knowing the universe than masculine science is structured to pursue—not ‘having one’s way with’ the natural world, but communing in a profound way that might blur the boundaries of the knowing subject and leave us transformed by the encounter” (Pollock 2024, 805).

I take Pollock’s point that the category of the erotic can be pitched in different ways, and I am all in favor of the normative injunction to produce a science that is less violent, less like domination, more like making love. Still, it is exactly the ambivalence of the erotic in the work of Black feminists like Sharon Patricia Holland (2012) that I find so constructive. Ambivalent in that the erotic contains pleasure and opens onto the forms of reciprocity that Pollock is right to remind us should always be squarely in our field of vision; but also points the way to the many forms of violence that are hinged to desire, and that pleasure itself makes possible (Schaefer 2015, 123). The desire to know has many domains of

violence (to return to Arthur's point above), and I want to keep those sequelae in the same frame as our desire to know in non-violent ways. That is my attempt at methodological symmetry.

I would say that sociality is not enough. And relationality is not enough. These explananda point to better approaches than the old positivist portrait of an individual genius staring in solitude at the world. But the approach I am suggesting wades even deeper into the complexity of sociality. Whereas the social sciences often see the dictum *it's social!* as a productive analytic terminus, I am arguing that it is only a move in the right direction. Sociality needs to be unpacked into all kinds of different processes that are better understood as affective: the pleasure of working in a well-tuned collaboration; the shame of knowingly publishing something that can be disproven; the sting of rivalry driving one to spend more hours at one's computer. Scientific emotions include, but are not limited to, social emotions.

van Emmerik phrases this in terms of an interesting question—one that I know I punted on in the book: the vectorial relationship between thinking and feeling. van Emmerik asks why I stress that thinking “buds” from feeling and notes the resonance of this concept with the early experimental psychology of Wilhelm Wundt. She goes on to suggest that a more consistent application of cogency theory would be to see thinking and feeling as fully interdigitated, with no firm priority awarded to either dimension. Put another way, she asks: “If feeling (re)shapes belief, then what (re)shapes feeling?” (van Emmerik 2024, 844).

van Emmerik is right that I do not offer a satisfying answer to this in the book, nor do I really have one now. My intuition is that there needs to be some kind of deep interrelatedness in the way we imagine the relationship between thinking and feeling. Ideas shape how we feel about things, just as feelings shape our mesh of cogency: what we find believable or preposterous. And yet, I cannot get away from the hunch that there is still some kind of priority to be located on the affective side of the equation. Maybe one way to say this would be that the affective dimension is better at creating conditions in which belief becomes possible or impossible than new information is at reconfiguring our emotional make-up. I think, in other words, that the substrate of our psyche is better understood as affective than as intellectual, and even to say it is simultaneously affective and intellectual is not quite right. Or maybe the category of *thinking* is too narrow, and the category of *feeling* just captures much more of the spectrum of thought. But that's just a hunch.

Shah offers another way of coming at this question, which is to bring in the dynamic of the conscious and the unconscious, and in particular the dynamic of *jitxi*—a rapid intuition about an object of knowledge—theorized by various STS/HPS scholars. “It all starts with the confused notes,” she writes, “which is followed by hummed and inaudible tunes gradually turning into a melody” (Shah 2024, 828). This is similar to the conclusion I'm fumbling towards—that we need to think of the affective as more foundational than the cognitive.

Nonetheless, I want to push back on part of how Shah (2024, 828) frames this, which is to emphasize that jazz indexes “the unconscious fundamentally structuring the conscious reasoning without the conscious even knowing it.” I have come to believe that the binary of conscious and unconscious—whether that is coming from psychoanalysis or somewhere else—is fundamentally unhelpful. It suggests a thick curtain encircling some areas of experience, rendering them unconscious, and a floodlit chamber containing the rest—the conscious. It is tempting to correlate unconscious:emotion::conscious:cognition. But I think affect theory, at its best, swiftly dissolves this too-tidy grid. Many emotions can be mustered to conscious awareness, just as many thoughts can be forever foreclosed from our field of attention.

Science is not all or nothing. And although training can refine and improve it, it does not actually require us to be told that it must be done just so. This is because it is built into our basic emotional make-up. An emotional make-up that is fully epistemological just as it’s fully affective. As van Emmerik (2024, 840–41) notes in her response, people who actually spend time raising children are confronted with this daily. I would say the same about paying attention to animals. Polanyi (Polanyi 1962, 140) is way ahead of us on this, as usual, in that he pays attention to both the ontogenetic (found among infants) and phylogenetic (found among nonhuman animals) precursors to scientific knowledge-production, “the inarticulate levels of intelligence of the animal and the infant, in which the personal coefficient of spoken knowledge is primordially preformed.” In other words, we can come to better grasp what is at stake in the depedestaling of science by studying our kin. Science—feeling our way along—is part of what it means to be animal.

Varieties of Scientific Feeling

Reeves and Pollock are onto something, I think, when they note that this emotional pluralism of the sense of science can also be productively sized up from the vantage point of the question of hot and cold passions. I want to open a more detailed dialogue with them about what, exactly, we mean by these terms—or what Hume calls violent and calm passions—and how we might best operationalize this framework in theorizing science.

I am excited to return to this topic, because I think *calm passions* is both an eminently necessary concept and a mysterious one. It is a kind of contradiction-in-terms, right? Or an oxymoron—literally a *sharp-dull*—words at war, a thing that shouldn’t be, passion that is dispassionate. And I think, on some register, it’s also central to the puzzle of why emotions are so hard to understand, how it is that the rigidity of our language betrays us, interring some of the most powerful forces in our lives in shadow. It is the everyday topography of what matters and what does not matter, defined by calm passions, that does the vast majority of the work of conducting power—not the punctal moments of grief, fury, or elation. And I would say the same about science.

Reeves (2024, 813) writes that

[h]ot emotions, like anger, fear, and love, move us to direct action because they are pleasurable. Cold emotions, which include the fear or shame associated with potential errors or deceit, also motivate action but on slower time scale. For instance, an individual grappling with addiction might opt for decisions that favor their long-term emotional health, despite potential short-term discomfort.

Hume's take on this (again, he's talking in terms of violent and calm passions) is somewhat different, though. He writes that the first criterion for distinguishing the varieties is not so much type of emotion, but intensity. But type seems to matter, too. So he proposes

there are certain calm desires and tendencies, which, tho' they be real passions, produce little emotion in the mind, and are more known by their effects than by the immediate feeling or sensation. These desires are of two kinds; either certain instincts originally implanted in our natures, such as benevolence and resentment, the love of life, and kindness to children; or the general appetite to good, and aversion to evil, consider'd merely as such. When any of these passions are calm, and cause no disorder in the soul, they are very readily taken for the determinations of reason, and are suppos'd to proceed from the same faculty, with that, which judges of truth and falsehood. (Hume 1960, 417)

This is the level of complexity Hume wants to bring us to: it is primarily about degree of intensity; secondarily about type of feeling. This is why Hume will affirm that reason is fundamentally an affective process, but because it primarily traffics in calm passions, we overlook the fact that it is, in fact, emotionally constituted: its “tranquility leads us into a mistake concerning them, and causes us to regard them as conclusions only of our intellectual faculties” (Hume 1960, 437). So the typology offered by Hume is not so much about cognitive and non-cognitive passions: it is a portrait of stronger, more palpable affects and subtler, often-unnoticed affects, all of which have cognitive consequences. And the latter—because they do not intrude on our awareness in the same way as their more garish counterparts—often do not get recognized as passions at all. That is partly why we have the thinking/feeling binary in the first place.

That is about as far as Hume gets. And when I read Hume on this, I hear him working something out—something he is not sure of, something our language and our philosophical inheritance has left in the murk. But I think Reeves adds something to the picture, which I would also want to draw out: time. I suspect that one of the ways of understanding the divergence between calm and violent

passions in Hume—and maybe the cold/hot metaphors, as well—is to think about them in terms of timescales. Different cognitive affects may be latching on to different degrees of futurity and pastness.

Take the Stanford Marshmallow Experiment, in which children’s ability to delay gratification was measured with a simple experimental set-up: they were offered a small treat (marshmallows, cookies, and pretzels were popular options) immediately or more treats if they would wait some period of time (Mischel, Ebbesen, and Zeiss 1972). The framing of this in terms of delayed gratification makes it sound like this is about putting emotions on pause. But that misses the deeply affective nature of the strategies used by the children to stay focused on the futural reward. As the experimenters wrote:

They made up quiet songs (“Oh this is your land in Redwood City”), hid their heads in their arms, pounded the floor with their feet, fiddled playfully and teasingly with the signal bell, verbalized the contingency (“If I stop now I get _____, but if I wait I get _____),” prayed to the ceiling, and so on. (Mischel, Ebbesen, and Zeiss 1972, 215)

In other words, rather than avoiding emotion, the children seem to have spontaneously improvised a range of techniques to train their emotions on a futural object rather than a proximal one. Calm passions, futural passions.

Reeves, then, is onto something in his framing of calm passions in terms of timescales. The phenomenologist Edmund Husserl’s vocabulary of *protentions* and *retentions* may be particularly valuable here. For Husserl, our experience in any given moment is actually a layering of three different processes: past-consciousness (retentions); original impressions of things experienced in the moment, and anticipations of future moments (protentions) (Beyer 2022). Husserl’s conception of this is focused on a narrow band of recent and imminent events. But really, our field of awareness is fashioned from a sedimentation of all kinds of retentions and protentions in any given moment—at many different scales. Distant memories and far-reaching anticipations are melded together in every instant of our experience.

Most importantly for our purposes, all of these latches to different timescales are affective. As Michelle Maiese writes “anticipation of the future, or what phenomenologists call ‘protention,’ always involves motivation, an affective tone, and readiness for intentional movement.... This flow of intentional movement and lived sensations is driven by *bodily feelings of caring*” (Maiese 2016, 33). The way we experience the world around us, then, is actually a dense stack of superimpositions—many retentions, many protentions—all catching different moments, different memories and anticipations, all affectively charged. The cumulative sum of all those charges is, in essence, our mood, “*an affective lens*, affecting how we are affected” (Ahmed 2014, 14).

These time-bound affective figments—protections and retentions—are trainable. The children staring down a cookie—and hoping it will become two—are seen praying, squirming, and making up songs to try to stay focused on a future moment. That reflects, I would say, both past emotional conditioning and an effort to self-train in the moment. It is about creating affective patterns of attention that will draw corresponding actions toward futural outcomes.

Reeves suggests that Kuhn's theory of scientific training can be grafted on to the idea of the sense of science—the unfurling agonism of scientific emotions—in *Wild Experiment*. Kuhn, he writes, asserts that “scientists have learned to use their cold emotions—a desire to avoid error and the shame that comes from mistakes—in their scientific practice” (Reeves 2024, 819). I agree on one level: I definitely think Kuhn's theory of scientific training can be adapted to this model. Kuhn himself, however, as I showed in *Wild Experiment's* Introduction, tends to be deeply disdainful of any explanations of the scientific process that are routed through emotion. This, too, is an account of the demarcation problem—how to separate scientists from nonscientist. Like Reeves, I would say that “[a]lthough a natural curiosity is common to humanity, the mental discipline to pursue learning is not universal. Learning presents a challenge because it initially involves absorbing information that requires effort and does not immediately gratify” (Reeves 2024, 820). That training is an affective training—and it has everything to do with how we encounter the different layers of retention and protection that make up our quotidian experience.

We can see how this plays out in Reeves's new (and very helpful) typology of conspiracy theorists, which I will abbreviate to the cheerful, fearful, and social varieties. The project of detailing the plural attractions of conspiracism in all their emotional particularities is exactly the conversation I think we need to be having right now to truly grasp what conspiracism is and how it manages to snare us so effectively. Reeves contends, though, that *Wild Experiment* only really offers explanatory tools for the first variety, and so misses some of the deeper entanglements of conspiracism and religion.

But I think there are ways of connecting cogency theory to all of these types. Reeves (2024, 814) suggests that for fearful conspiracists, conspiracy theories “are often not enjoyable and cause spiritual trauma that comes from living with a pervasive sense of danger, mistrust, and paranoia.” For my part, I am not sure it is so easy to divide pleasure and pain—even pleasure and trauma. One of the most profound insights to come out of affect theory is Lauren Berlant's startling idea of cruel optimism (Berlant 2011). For Berlant, we can be attached—affectively—to worlds, objects, and other people that are actively harming us. And the harm can be part of what renders the attachment so intransigent. Conspiracism is, for many, I suspect, a similar kind of exchange. You are caught in these very tight cycles of anticipation and dread, causing you to keep holding

a possibility in front of you to seize it, control it, keep it pinned by your attention so it stays in your sight. And that brings its own sense of power and thrill. They are kernels of white-hot passion, a fusion core of pleasure and pain.

Even Reeves's third type of conspiracist—the social conspiracy theorists who live in “skeptical information environments,” such as certain religious communities, and have absorbed the conspiracist habits of thinking of their milieu by rote—can be encountered in terms of cogency. Reeves (2024, 815) asks: “do humans accept all beliefs because of emotional investment, or are some beliefs accepted ‘secondhand’ from trusted figures from one’s communities?” and responds that many who come to conspiracism through religious communities “hold many beliefs that are emotionally inert.” By way of examples, Reeves (2024, 815) offers his own convictions that

water is composed of one water and two hydrogen atoms or that my mother was born in the state of Alabama. These beliefs are accepted without question until a sense of discomfort suggests that it might call for closer examination. Emotion, in this context, acts more as a detector for questionable beliefs rather than as a source of pleasure, but it takes too much effort to assess all our new beliefs. As two psychologists have recently argued, susceptibility to partisan fake news is better explained by lack of reasoning (i.e., laziness) than by motivated reasoning (i.e., a dopamine hit of pleasure).

My rejoinder to this is to ask, simply, why we have so much confidence that these processes are affectless. As with Reeves's points about the reducibility of scientific emotions to sociality I notice that Reeves's vocabulary inadvertently glides into the affective dimensions of the processes he is describing—the “sense of discomfort” when confronted with new beliefs, for instance. What's the emotional make-up of “lack of reasoning (i.e., laziness)”? What's the emotional make-up of “detect[ing] questionable beliefs”? This is where cogency theory calls us to fundamentally rethink the way we model emotion and cognition in the first instance. It is not just about feelings at the macro register, the emotions that wash over us, that we give names to. Our cognitive emotions define our encounter with every word, fact, and idea at the micro level, running over the granular texture of information and defining our responses.

Conclusion

Shah begins her response with a moving passage from a personal letter sent to her by the now passed Evelyn Fox Keller. Keller was responding to the publication of Shah's book *Who Is the Scientist-Subject? Affective History of the Gene* (2018), a brilliant study of the links between scientific knowledge-production and emotional dynamics. But Keller's letter is posed in a mood of tragic

resignation—a sense of defeat inculcated by decades of constant reminder that the whole apparatus of the humanities has been tuned to see feeling/affect/emotion as trivial, irrelevant—even embarrassing.

The letter's poignant reflection on the long tyranny of the thinking-feeling binary made me think of this passage in David Hume's *Treatise of Human Nature*:

Nothing is more usual in philosophy, and even in common life, than to talk of the combat of passion and reason, to give the preference to reason, and to assert that men are only so far virtuous as they conform themselves to its dictates. Every rational creature, 'tis said, is oblig'd to regulate his actions by reason; and if any other motive or principle challenge the direction of his conduct, he ought to oppose it, 'till it be entirely subdu'd, or at least brought to a conformity with that superior principle. (Hume 1960, 413)

This paragraph—written almost 300 years ago—was part of a wider trend in eighteenth-century thinking toward taking emotion seriously—including in profoundly rethinking the relationship between thinking and feeling (Riskin 2002; Sullivan 2020). But three centuries later, we are still stuck on that same cusp. Western philosophy has, for three centuries, struggled with the riptide of the thinking-feeling binary. My hope is that the voices and counter-voices running through this Book Symposium point beyond this trap, underwriting new conversations that will help fashion a clearer picture of the landscape of how we think, believe, and make science in the world.

Notes

- ¹ Sergio Sismondo's *An Introduction to Science and Technology Studies*, for instance, takes it as a given that the anti-formalist approach of Thomas Kuhn is foundational to contemporary STS (Sismondo 2010, 12).
- ² With some conspicuous exceptions. See, e.g., Gazzaniga (2005) and Harris (2010), the latter particularly well known for the controversy it sparked (see Pigliucci 2013).
- ³ See Darwin's discussion of the facial expressions corresponding to reflection in *Expression of the Emotions in Man and Animals* (Darwin 2009, 204–9).

References

- Ahmed, Sara. 2014. "Not in the Mood." *New Formations* 82:13–28.
- Arthur, Mathew, ed. 2023. *Everything Is a Lab: Doing Ordinary Science*. Lancaster, PA: Imbricate! Press.
- . 2024. "STS and Affect in the Wild." *Zygon: Journal of Religion and Science* 59 (3): 788–99.
- Berlant, Lauren. 2011. *Cruel Optimism*. Durham, NC: Duke University Press.
- Beyer, Christian. 2022. "Edmund Husserl." In *The Stanford Encyclopedia of Philosophy* (Winter 2022 Edition), edited by Edward N. Zalta and Uri Nodelman. <https://plato.stanford.edu/archives/win2022/entries/husserl/>.
- Blankholm, Joseph. 2022. *The Secular Paradox: On the Religiosity of the Not Religious*. New York: New York University Press.
- Block, Tina. 2016. *The Secular Northwest: Religion and Irreligion in Everyday Postwar Life*. Vancouver, BC: University of British Columbia Press.
- Bodiford, William M. 2010. "Belief Systems: Japanese Martial Arts and Religion Since 1868." In *Martial Arts of the world: An Encyclopedia, Vols. 1&2*, edited by Thomas A. Green, 382–94. Santa Barbara, CA: ABC-CLIO.
- Brooke, John Hedley. 1991. *Science and Religion: Some Historical Perspectives*. Cambridge: Cambridge University Press.
- Darwin, Charles. 1858. "Letter no. 2298." Darwin Correspondence Project. June 29, 1858. <https://www.darwinproject.ac.uk/letter/?docId=letters/DCP-LETT-2298.xml>.
- Feyerabend, Paul. 1993. *Against Method*. 3rd ed. London: Verso Books.
- Fields, Karen E., and Barbara J. Fields. 2014. *Racecraft: The Soul of Inequality in American Life*. London: Verso Books.
- Galileo, Galilei. 1957. "Letter to the Grand Duchess Christina." In *Discoveries and Opinions of Galileo*, translated by Stillman Drake, 173–216. New York: Anchor Books.
- Gazzaniga, Michael S. 2005. *The Ethical Brain*. New York: Dana Press.
- Gould, Stephen Jay. 1999. *Rocks of Ages: Science and Religion in the Fullness of Life*. New York: Ballantine.
- Haraway, Donna J. 1991. *Simians, Cyborgs, and Women: The Reinvention of Nature*. New York: Routledge.
- Harris, Sam. 2010. *The Moral Landscape: How Science Can Determine Human Values*. New York: Free Press.
- Harrison, Peter. 2015. *The Territories of Science and Religion*. Chicago: University of Chicago Press.
- Holland, Sharon Patricia. 2012. *The Erotic Life of Racism*. Durham, NC: Duke University Press.
- Jordan-Young, Rebecca M., and Katrina Karzakis. 2019. *Testosterone: An Unauthorized Biography*. Cambridge, MA: Harvard University Press.
- Lee, Lois. 2015. *Recognizing the Non-Religious: Reimagining the Secular*. Oxford: Oxford University Press.
- Lind af Hageby, L., and L. K. Sohrtau. 1903. *The Shambles of Science: Extracts from the Diary of Two Students of Physiology*. 3rd ed. London: Ernest Bell.
- Maiese, Michelle. 2016. *Embodied Selves and Divided Minds*. Oxford: Oxford University Press.
- Mangan, J. A., and Takeshi Komagome. 1999. "Militarism, Sacrifice and Emperor Worship: The Expendable Male Body in Fascist Japanese Martial Culture." *The International Journal of the History of Sport* 16 (4): 181–204.
- Masuzawa, Tomoko. 2005. *The Invention of World Religions: Or, How European Universalism Was Preserved in the Language of Pluralism*. Chicago: University of Chicago Press.

- McCutcheon, Russell T. 2003. *The Discipline of Religion: Structure, Meaning, Rhetoric*. New York: Routledge.
- McGrath, Alister E. 2019. *The Territories of Human Reason: Science and Theology in an Age of Multiple Rationalities*. Oxford: Oxford University Press.
- Mercadante, Linda E. 2014. *Belief without Borders: Inside the Minds of the Spiritual but Not Religious*. New York: Oxford University Press.
- Midgley, Mary. 2002. *Evolution as a Religion: Strange Hopes and Stranger Fears*. Abingdon, UK: Routledge.
- Mischel, Walter, Ebbe B. Ebbesen, and Antonette Raskoff Zeiss. 1972. "Cognitive and Attentional Mechanisms in Delay of Gratification." *Journal of Personality and Social Psychology* 21 (2): 204–18.
- Nongbri, Brent. 2013. *Before Religion: A History of a Modern Concept*. New Haven, CT: Yale University Press.
- Oreskes, Naomi, and Erik M. Conway. 2010. *Merchants of Doubt: How a Handful of Scientists Obscured the Truth on Issues from Tobacco Smoke to Global Warming*. New York: Bloomsbury Press.
- Pigliucci, Massimo. 2013. "New Atheism and the Scientistic Turn in the Atheism Movement." *Midwest Studies in Philosophy* XXXVII:142–53.
- Polanyi, Michael. 1962. *Personal Knowledge: Towards a Post-Critical Philosophy*. London: Routledge.
- Pollock, Anne. 2024. "Cultivating Calm Passions." *Zygon: Journal of Religion and Science* 59 (3): 800–10.
- Prescod-Weinstein, Chandra. 2021. *The Disordered Cosmos: A Journey into Dark Matter, Spacetime, and Dreams Deferred*. New York: Bold Type Books.
- Reeves, Josh A. 2024. "Kuhn, Conspiracy Theories, and Scientific Progress." *Zygon: Journal of Religion and Science* 59 (3): 811–24.
- Riskin, Jessica. 2002. *Science in the Age of Sensibility: The Sentimental Empiricists of the French Enlightenment*. Chicago: University of Chicago Press.
- Schaefer, Donovan O. 2023. "Voracious Secularism: Emotional Habitus and the Desire for Knowledge in Animal Experimentation." *Religion* 54 (4): 700–23.
- . 2015. *Religious Affects: Animality, Evolution, and Power*. Durham, NC: Duke University Press.
- . 2022. *Wild Experiment: Feeling Science and Secularism after Darwin*. Durham, NC: Duke University Press.
- Scheer, Monique. "Are Emotions a Kind of Practice (And Is That What Makes Them Have a History)? A Bourdieuan Approach to Understanding Emotion." *History and Theory* 51 (May 2012): 193–220.
- Shah, Esha. 2018. *Who Is the Scientist-Subject? Affective History of the Gene*. New York: Routledge.
- . 2024. "Love Affair with an Idea." *Zygon: Journal of Religion and Science* 59 (3): 825–38.
- Sismondo, Sergio. 2010. *An Introduction to Science and Technology Studies*. 2nd ed. Oxford: Wiley-Blackwell.
- Smith, Jonathan Z. 2004. *Relating Religion: Essays in the Study of Religion*. Chicago: University of Chicago Press.
- Sullivan, Marek. 2020. *Secular Assemblages: Affect, Orientalism, and Power*. London: Bloomsbury.
- Todd, Douglas. 2022. "Metro Vancouver Tops List of Non-Religious Big Cities in North America." *The Vancouver Sun*. October 27, 2022. <https://vancouver.sun.com/opinion/columnists/douglas-todd-metro-vancouver-tops-list-of-non-religious-big-cities-in-north-america>.
- van Emmerik, Mari. 2024. "Changing Minds: Cogency Theory and Secular Bodies." *Zygon: Journal of Religion and Science* 59 (3): 839–49.
- Yuan, Li. 2024. "Is Xenophobia on Chinese Social Media Teaching Real-World Hate?" *The New York Times*. July 4, 2024. <https://www.nytimes.com/2024/07/04/business/china-hate-speech-xenophobia.html>.

