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INTRODUCTION

Science Out of Feminist Theory Part One: Feminism's Sciences

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In 2012, Sophia Roosth and Astrid Schrader edited a special issue of *differences: A Journal of Feminist Cultural Studies* entitled "Feminist Theory Out of Science." Drawing heavily from feminist new materialism, the issue was devoted to revisiting the annals, practices, and knowledges of science to produce a revised scientific and more feminist account of the world. The essays in the volume uncovered a distinctly feminist, and imaginative landscape in the work of some of the most famous scientists and sciences of the West, revealing the degree to which social and historical forces have chosen and drawn on the more regressive elements of the scientific record. The issue called on feminists to go back to the "sources" of science to unearth more progressive and feminist sensibilities, theories, and imaginations. The editors argued that "what emerges from these diverse essays is an approach to critical thinking that

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inhabits, elaborates, and feeds upon scientific theory, holding feminist theory accountable to science and vice versa." Roosth and Schrader describe their project "as an attempt to refigure possible relationships and traffic between feminism and science," offering the tantalizing possibility that other sciences, and other futures were always possible.

As editors of this special issue of *Catalyst*, we share Roosth's and Schrader's desire to move beyond tired arguments about whether the humanities and the sciences are "two cultures" (Snow 1959, Lee and Wallerstein 2016), or more recent debates about "new materialism" in feminist studies. The provocation for "Science Out of Feminist Theory" comes in part out of a critique of the "traffic" metaphor and its limits as a resource for imagining science anew. Traffic has emerged as an important metaphor for challenging the binary opposition of feminism and science by suggesting that they are connected by what "travels" between them, in both directions. Ideas, theories, politics, and language constantly travel these "two way streets" (Fausto Sterling 1992) between feminism and science. In reading the wonderfully eclectic assortment of essays in our double special issue of *Catalyst*, we suggest that, taken together, the authors' visions of "science out of feminist theory" collectively highlight the vastly unequal and complex terrain on which this traffic traverses. Indeed, to pay attention to this terrain is to recognize the many potholes, obstacles, dead ends, detours, accidents, and vehicles driven off the road.

The fundamental argument that theories and knowledge travel between feminism and science is by now a foundational claim for feminist science and technology studies. As a result, over the last few decades, the field has developed rich accounts of the dense traffic between science and feminism, and between their proper objects—nature and culture. Indeed, rather than nature and culture, we now talk about *naturecultures*. However, in the move to track naturecultures, we often elide the unequal status of feminism and science as knowledge projects. Too often, feminism and science appear as known quantities, startlingly

monolithic in our rhetoric for all our claims to interrogate their meanings. The common proposition is that: We are feminists and science is never us, never what we're doing. Whether we are admonishing our peers for not "taking science seriously" (and conversely congratulating ourselves) or damning science for its part in the violence we see in our worlds, science is outside of feminism.

Moored in this logic, recent accounts of what we might call feminist science have called for a shift in feminism's relationship with science. Citing a historically antagonistic relationship, they argue that feminism needs to overcome its old "anti-science" attitudes and learn to embrace science. There are many versions of this call for re-engagement (Alaimo and Heckman 2008, Coole and Frost 2010, Grosz 2011, Hird 2004, Wilson 2004; see also Ahmed 2004). As Sara Giordano notes in this special issue, readings of "anti-science" feminism imagine feminist and scientific approaches as occupying a power-neutral relationship. Willey (2017) argues that these accounts narrate a gendered romance, one that begins with adversity, trudges through hard-won growth, and leaves us with a newly "science friendly feminism" and "anti-essentialist science" that might beat the odds yet and wind up snuggling by the proverbial fire.[1] This recent exhortation to feminists to embrace The Institution of Science is one both of us have found less critical than their authors' ambitions call for.

As editors, we are suspicious of the invocation of an easy parallelism between feminism and science, especially one where feminism is exhorted to sideline critique in order to learn from science, or to develop a more "affectionate" relationship (Wilson 2004) with it. Indeed, we can recover feminist genealogies in science, and scientific/materialist genealogies in feminism, because both science and feminism have too often emerged as monolithic overdetermined categories that ignore the heterogeneity within. Perhaps, as Subramaniam has argued, rather than trying to imagine that we have buried the colonial and gendered violences of our sciences in the past, we might instead imagine a scientific future that allows us to live with its

ghosts—the elisions and erasures of our histories of feminism and science (Subramaniam 2014).

At the heart of "Science Out of Feminist Theory" is an interrogation of the term "science." What do we mean by it? In mainstream representations, "science" is presented as a cohesive body of disciplines in the natural sciences that emerged in the west and focused on studying the natural world with a unique and objective "scientific method." Science and technology studies (STS) has long challenged this simplistic reading. Thomas Kuhn (1962: 42) argued that science was a "rather ramshackle structure with little coherence among its various parts." Scholars in STS have increasingly viewed science as a heterogeneous body of work created less by coherence and more by historical contingencies. Most agree that there is no single enterprise of "science" but rather a large variety of "special studies" that have been grouped together under this label (Dear 2012).

Of course, as with "science," "feminism" is not a monolithic term, either. We have seen a wide variety of analytic frameworks produce a cornucopia of feminisms—postcolonial feminisms, indigenous feminisms, women of color feminisms, queer feminisms, socialist feminisms, ecofeminisms, just to name a few. Most agree that there is no unifying analysis that all feminists share. Thus, instead of thinking about "feminism" and "science" as separate and known quantities in *relationship*, we want to open up further space for thinking about feminism as a site for theorizing and reconfiguring the very meanings of science. Rather than be stuck in the proverbial traffic jam of interdisciplinary travel, we propose excavating the diverse and eclectic genealogies and traditions within feminist theories to reimagine what science is and might be.

In our CFP for "Science out of Feminist Theory," we invited manuscripts that might address the following questions:

* How does feminist theory help us shape the goals of inquiry—what do we need to know about our world/s? How might we best study these?

* Are all objects best studied by scientific methods or by the humanities? Or are some necessarily interdisciplinary objects?

* How might feminist thought help us re-articulate what constitutes scientific knowledge? What constitutes "usable" or "valid" knowledge?

* How do we distribute epistemic authority on the proper objects of science and feminism? How might they be related?

* How can feminist theories (of nature, embodiment, technology, behavior) be conceived as scientific inquiry? (We welcome case studies, hypothetical experiments, aligning the language of feminist theory and science, analyses from feminist theory that help us rearticulate scientific questions into new questions for feminism and science)

* Explorations of the "proper "objects of feminist thought and science

* Theorizing the idea of "feminist science"—Is it possible? Desirable? What is it?

* What are the forms of scientific inquiry? What kinds of theories, experiments, methods constitute scientific inquiry? Does critique also constitute knowledge? How might feminist theory help

reframe these questions?

* How can feminist theory allow us a more capacious definition of science as a postcolonial, queer, feminist enterprise?

The essays we received in response to the call did not disappoint. Indeed, we received many more abstracts than we were able to include even as the special issue expanded to two. Some aspects of the submissions were striking. Taken together, they raise some profound and important questions.

A critical question that emerged was how we understand the "proper objects" of feminism. In asking "How might scholars generate critical theories *out of* scientific ones?," Roosth and Schrader (2012) clarify: "'Feminist theory out of science' does not imply that feminist theory emerges from science. It implies, rather, that the world is already theory all the way down." We want to express our appreciation of the struggle to name and describe a project that would help us to think about feminist theory as a site for theorizing the stuff of the world, what we refer to here as science's proper objects. We also appreciate the impulse to think capaciously about what constitutes "theory." At the same time, we want to push back on a persistent conflation of "science" with "the world" (Willey 2016). Science is a set of disciplines and interdisciplines and their attendant apparatuses, theories, methodologies, and practices. The world "all the way down" is its object of study. Similarly, "culture" is understood as the proper object of study for the humanities, and "nature" outside its disciplinary bounds. If culture and nature are indeed entangled (Barad 2007, Haraway 2008), we need methodological tools for natureculture research. Our project is thus partly a critique of proper objects (Butler 2004, Willey 2017), animated by the question: what might it look like to imagine critical theory as a site for knowing those objects we consider science's domain (or even as "science" itself)?

Our approach, importantly, comes out of postcolonial science studies and some of its core insights, including the understanding that not all systems for making sense of science's proper objects "count" as

science. Science is not simply the name for knowledges of nature, bodies, and other manifestations of microscopic to cosmic physicality. As western colonial powers expanded, so much of knowledge across the world was written off as unscientific, backward, pseudoscience, magical, or more recently categorized as "alternative" or "indigenous" knowledges. This was precisely done to demarcate the contours of a "legitimate" "superior" knowledge called "Science." As postcolonial studies reinforces, Science was not just mobilized in service of colonial agendas, but rather materialized through epistemic imperialism at the heart of colonization. The consolidation of the authority of particular (European) modalities and vocabularies to tell us who and what we are is a shared foundation of naturalized Science *and* naturalized inequality. We should all be concerned by the fact that while "science" is in fact a particular set of epistemologies and methodologies, and quite a narrow one in the scheme of things, it simultaneously occupies a status so unproblematized that it can be conflated in critical theory with "the world itself."

Many scholars have tried to resolve these troubling legacies. One important strategy in combatting epistemic imperialism has been to reveal science as we know it as one among many "ethnosciences" (Harding 2006) and to rescale its authority thus. This redistribution of epistemic authority has opened doors for thinking about kitchen and garage experimentalism (Jen 2015), science shops (Weasel 2001), indigenous materialisms (TallBear 2017), alternate and indigenous sciences and medicine (Nandy 1980, Shiva 1993, Viswanathan 2006), and indeed critical theory as sites of scientific knowledge production. We are quite alert to the risk of reinforcing the epistemic imperialism on which the idea of ever increasing knowledge accumulation depends merely by claiming to do science. We are also attuned to the trap of a naïve proto-nativism or a simplistic politics of authenticity where the past (or some supposedly subaltern theory or practice) is sometimes unproblematically valorized. We have each had our own struggles with articulating a sense that the risks that inhere in claiming science are worth taking and that

certain possibilities are opened up by going there.

In simple terms, the benefit of this redistribution is twofold: first, to lessen the power of certain constituencies and institutional formations to define our problems and their solutions and thus to undermine the sadly naturalized place of profit in science (Harding 1991, Pollock 2012, Sunder Rajan 2017); and second, to offer new ways of thinking about the objects, problems, and solutions that science has studied. We believe that proliferating sciences has the potential to undo rigid boundaries around what counts and to make strange those entrenched conventions of reduction, framing, measuring, categorizing, and decontextualizing feminists have critiqued in science. Even those sciences least determinist and most attuned to complexity (Pitts Taylor 2016; Subramaniam and Willey 2016) fall into these traps—they are endemic to the positivist epistemologies that produce them and conventionally mark the boundary between science and myth. As Haraway (1991) argued so famously in "The Cyborg Manifesto," we need science, our myth. Science here is storytelling, not *separate* from non-science but *like* those theories that don't count, another set of narrative resources for imagining what we are and might become, for undergirding less violent imaginaries about human/non-human/planetary futures. We want this proliferation in part to provide us with a rich array of narrative resources out of which to build these worlds and the projects that will support them.

Clearly, there is a strong materialist bent to such a project. We want to participate in readying the ground, if you will, for a materialism oriented to the undoing of the categories that structure our worlds, the critique of which is at the heart of critical theory. This is in part a project of reading critique as "science." Feminist scholars have done a great deal of work to trace complex histories of race, sex/gender, sexuality, reproduction, disability and attendant concepts of beauty, intelligence, strength, and so on. These histories, we argue, should not be read as merely "social constructionist," but rather also for their materialist valances. If the destabilization of said categories is too often reduced to the social, the re/turn to "biology" is far too often a return to these

categories. Willey offers the concept of "biopossibility" as a substitute for "biology" in queer feminist materialist projects oriented to undoing (Willey 2016). It is a way of exploring the materiality of a phenomenon that acknowledges that its very intelligibility is historically and culturally contingent.

We would like to extend that ethic of undoing not just to entrenched scientific epistemologies, practices, and forms and to the categories which structure our worlds, but also to the histories that have made the study of the materiality of things restricted territory. In undoing assumptions about what science is and what its goals might be, we hope to open up space for thinking about feminist studies as an institutional and conceptual space for knowledge-making that can encompass descriptions and theories of physicality-in-context.

With this vision in mind, we sought submissions with strong critical orientations and which offered resources for thinking about the stuff of the world—or what it means to contribute to knowing the stuff of the world—grounded in feminist thought. We received an exciting and rich set of essays. Some aspects are worth noting. It was clear that feminist STS had matured into a field where authors revealed diverse understandings and commitments to the projects of feminism and science, yet they shared some theoretical assumptions. To avoid repetition, we asked authors to take these assumptions for granted. We also asked them to join us in an experiment to try to implement a shared lexicon to aid us collectively in holding some important conceptual distinctions between objects and modes of inquiry. We share all of this here, because we believe highlighting this continuity suggests some key insights for the field. Here are the guidelines we developed:

First, we grounded these special issues on a few "givens." Feminist Science and Technology Studies (FSTS) is now a visible field, albeit diverse and porous. The contributions of FSTS and STS over the last many decades have also solidified the claim that science and scientific knowledges must always be located within their historical, cultural, and political contexts. There is no neutral "Science" that escapes

being implicated in various political and social projects; a myth Haraway calls the "God Trick" (Haraway 1988). By the same token, there is no unmediated "nature" out there. Anything we might say about the stuff of the world is mediated by observation, interpretation, and language and other mechanisms of representation. These assumptions are a starting place for this volume—we believe these are well-established claims by now. We have asked all the authors not to rehearse these arguments again. In particular, we shared with authors our conviction that we do need more accounts about "how" science is implicated in various projects, but not *that* it is.

Second, we noticed that different authors used the terms "Science," "science," "biology," "body/ies," "matter," and "materiality" differently. To aid the reader, and in the hopes of forging a more precise working lexicon that might inform methodologies for thinking science out of feminist theory, we developed suggestions for a consistent usage of these terms. We have found Sandra Harding's distinction between "Science" (capital S) and the world of sciences (lower case s) excluded from its definition so fruitful ourselves for imagining science out of feminist theory, we would like to extend that logic here to other frequently-used terms implicated in this same epistemological re-signifying tension. Thus, when we use the words "Science" or phrases like "the biosciences," we mean knowledge that is produced through the legitimizing apparatus of various institutions, approved by reviewers and published (or legitimated by patents), i.e., this is "official" knowledge. Someone can produce scientific knowledge in their garage or kitchen, but not "Scientific" knowledge. For the latter, we use "sciences"—small s, and plural—to mean knowledges that are scientific by all measures except that they are not authenticated by the official apparatus of science. In other words, sciences refers to vast and diverse disciplinary and extra-disciplinary contributions to knowing our worlds. We aim to avoid slippages among Scientific disciplines, methods, and practices and science's proper objects: i.e. bodies, matter, nature, etc. We can make these efforts visible by extending the use of capital and lowercase to

these other terms. Biology is an especially slippery one, as it refers both to a discipline (hence the "-ology") and to the "stuff" itself. In our writing, we suggest that we use the capital-B Biology to refer to the disciplinary field of Science. Use lowercase-b biology/biological to refer to the processes of bodily and natural explications. Similarly, "Nature" and "The Body" refer to hegemonic accounts of particular objects of Science. In contrast "bodies" and "nature" can be sites that are opened up to more natureculture understandings. We seek specificity when naming the stuff of our worlds—from the molecular to the epi-phenomenal—and try to avoid the disciplining disciplinary traps in which the historic and persistent division of nature and culture has left us moored. This might mean extending these logics further to make visible the distance between the objects as imagined by Science and as opened up by science out of feminist theory (e.g. "Climate Change," "The Fetus," etc.). If authors invent additional terms, they have defined them in the piece. If they have used these terms in some other specified way, they have explained carefully the terms' referent and the logics behind their usage.

And on the matter of matter/the material/materialism: "Matter" has emerged as an object for feminist thought in ways that often take for granted what types of representations give us access to it. Scientific ways of knowing are consistently presumed to offer more direct and reliable access to matter, or materiality, than other ways of knowing. Hence feminist materialism is sometimes undertheorized, presumptively meaning feminism as a beneficiary of Scientific Data. We resist this *a priori* assumption, and encouraged all authors to be specific about what sort of evidence they are drawing on to invoke matter or to articulate a materialist approach, and to steer clear of vague claims about Matter's importance or marginalization in feminist or critical theory, etc. These types of claims, we believe, reinforce a hierarchy of disciplinary knowledge-making practices antithetical to the project of imaging science out of feminist theory. In keeping with the capital/lowercase strategy, we use "Matter" if we are referring to the "stuff" as mediated/represented by Scientific Data and "matter" if we are

advancing some other more capacious definition.

Our aim, we hope it is clear, was not to prohibit nor prescribe, but to make visible our collective processes in order to generate and proliferate methodological possibilities for science out of feminist theory. We see feminist thought as ripe with under-theorized, under-utilized concepts, lexicons, archives, data, etc. Each of the authors in the two special issues contributes something valuable to the project of culling resources that might enable our imagining of new accounts of our naturecultural worlds and new ways of describing and understanding those knowledge projects. We—feminist science studies scholars—must learn to think of ourselves not only as critics or students of science, but as makers of scientific knowledge. In response to our call, the authors of these essays do this in diverse ways, opening up new questions, epistemologies, and methods for doing science and, in so doing, troubling the concept itself. Out of their combined efforts, we can begin to imagine feminist studies as a site for kinds of scientific knowledge production that can transform the political and epistemological landscapes of debates about a monolithic "science." What sciences would we put on our proverbial boots to march for? What worlds do their varied knowledge projects come out of and lend themselves to materializing?

This first of our two special issues suggests that something we might call "Feminism's Sciences" exist and are ripe to be reckoned with. Venla Oikkonen's essay makes a profound contribution to thinking about the methodological possibilities of feminism's sciences as experiments in transdisciplinarity. By reading population genetics alongside queer theorizations of temporality, she demonstrates how temporality and belonging can help us to rethink the *Genographic Project.* Importantly, in putting these concepts forth as transdisciplinary objects, Oikkonen models a strategy for putting two epistemologically incommensurate approaches into dialogue to rethink the *a priori* assumptions embedded in each and to yield new natureculture insights. Such an approach contributes both to "harm reduction" given the pervasiveness of

appropriations of a neo-Darwinian evolutionism and to the proliferation of queerer stories about what we are.

Pratistha Bhattarai interrogates what "source code" actually is, demonstrating how racial and colonial imaginaries are intricately bound into the logics of algorithms. Her essay follows in the long tradition of looking behind the numbers and reinforces a central insight of feminist STS that there is no neutral position, all science, especially and including numbers are bound within matrices of power. Thinking from feminist theory, Bhattarai offers a Spivakian lens that allows us to see a path to developing more deliberative, antiracist algorithms that challenge racist policies in the guise of neutral science. Bhattarai provides us with a detailed case study for operationalizing the critical insight that values are embedded in modes and means of measurement. That feminism's sciences might code for our own values is both a literal and metaphorical provocation.

Chikako Takeshita beautifully weaves in a naturecultural vision by bringing together feminist critique of representations of reproductive bodies with recent scientific work on pregnancy and multispecies thinking. Disrupting the pervasiveness of mother/fetus binary logics, and at the same time unsettling the a priori gendering of the pregnant body, Takeshita suggests the model of holobiant creating holobiant as a way of rethinking pregnancy and upsetting the parameters of feminist debate on fetal politics. Her contribution powerfully demonstrates how bringing a feminist lens to scientific data can enable us to develop frameworks to produce not a normative body but more words, richer vocabularies, manifold sciences, and thus more capacious forms and understandings of embodiment.

Harlan Weaver's essay demonstrates how sites of "science" function—drawing together bioscientific knowledge alongside thick descriptions and hands-on affective relationships with pets. Drawing on theories of intersectionalities, Weaver unpacks the "fuzzy" science of dog training to reveal racialized dimensions of human/animal interactions. Locating these interactions within racialized histories of dog-care, Weaver

reminds us that paying attention to histories and sociologies of the "objects" of science can help us produce a more reflexive, ethical, and deliberative feminist science. Weaver's account of the fuzzy sciences of feminist shelter work also provides a model for thinking about "fuzzying" as a way we engage and transform Scientific knowledges in our everyday lives. This lens opens up space for reading dogs and the humans with whom they interact as participants in the making of knowledges about their own nature.

Thinking the "fuzzy" science of the dog training world of Weaver alongside Sharra Vostral's historical account of the Science of menstruation demonstrates the elisions and erasures that render one unscientific and the second scientific. Vostral describes the campaign of *Our Bodies Ourselves* to standardize absorbency rates in tampons in the aftermath of Toxic Shock Syndrome. Vostral ably demonstrates the systematic ways that feminists developed innovative scientific techniques to better measure tampon absorbency to provide data for tampon labeling. Yet, the total resistance of the tampon industry to these innovations has resulted in continued imprecision and potentially harmful practices. This episode demonstrates the continued privileging of profits over safety. A recent campaign points out that we still do not know the materials in tampons, and tampon makers continue to resist any accountability (Rabin 2017). Vostral cautions us to continue to monitor the many potentially harmful products that continue to shape our lives, and the importance of feminist STS in recovering these histories. The piece provides a powerful reminder that it is not accountability to a Truth ideal, but rather to communities, that renders more reliable empirical data. Such histories help us to understand not only why Science cannot be trusted out of hand, but why we need feminist sciences that don't "leave biology to scientists" who are not held accountable (Birke 2000).

Sara Giordano challenges feminists to develop a more nuanced and principled position in challenges to Science. If feminist STS has revealed anything, it is that that the apparatus of science has been nourished and shaped by its colonial, imperialist, racist, sexist, ableist

and heterosexist legacies. She urges us to develop a richer vocabulary for telling stories of our engagements with science and our affective relationships to it, accounts that do not succumb to the romance of an overdetermined privileged Science. Rather, feminists must continue to build spaces and imaginaries of the sciences. Giordano challenges feminists to revalue feminist teaching and to approach the work of critical science literacy as a "re-writing" project that is itself productive of new scientific knowledges.

Finally, one of the critical insights of feminist science studies is that genres of writing are epistemological tools themselves and enable and disable particular kinds of learning and understanding (Subramaniam 2014). To this end, we have embraced *Catalyst's* multiple formats to strengthen the special issues by inviting and incorporating additional pieces. Through these pieces, we hope to animate the generativity of the larger project of "Science out of Feminist Theory."

Michelle Murphy's splendid plenary lecture at the 4S meetings in Barcelona in 2016 speaks directly to the larger theme of science out of feminist theory in asking to what extent embodied knowledge can be "a form of science and technology by other means?" In chronicling the cycles of chemical violence, Murphy explores alter embodiment, *Alterlife* that is both a site already severely damaged by the ravages of environmental toxicity but also one with the potential for other possibilities and futures. As Murphy argues, "Alterlife, as potential, challenges us to learn with a thick archive and dense present of projects of resistance and resurgence. It is also an invitation to consider what infrastructures and concepts have to be *dismantled* to make room for another way of being and knowing to emerge."

In the Interview section, Rachel Lee introduces and curates a wonderful set of four interviews with scientists doing field and bench science. Lee's interviews are encouraging and hopeful about the legacies of feminist science and technology studies, as well as thoughtful about the challenges on how to foster greater diversity of personnel and interdisciplinarity in the sciences. In the interviews, scientists show us

that some of the key questions that have animated feminists, such as the importance of interrogating a binary sex/gender system, incorporating ethics and social justice as an important and legitimate part of science and scientific thinking, and nurturing a new generation of more diverse scientists - are all elements that are embraced by some scientists as an important part of the scientific endeavor. The narratives are rich, complex and nuanced giving us a window into the challenges of the working lives of scientists today.

The Lab Meeting format brings together individuals to informally discuss a common question or project. Here, an interdisciplinary group of scholars reflect on the Black Lives Matter Movement. The collection is a wonderful display of the diversity, at times even incommensurable and contradictory impulses of various (inter)discplines. For example, some of the scientists in this section use feminism to promote an equity project focused on the need to recruit and retain more black scientists in the scientific enterprise. Yet others use their standpoint to critique Science, and the lack of support for and attention to Scientific investigations into questions and foci that impact black lives. Yet others take on a more radical suggestion that living in and understanding black communities should be central to anti-racist investigations of science. Some of the authors argue that one cannot just produce health variables, diagnoses, protocols or solutions based on the experiences of elite white populations and expect them to serve everyone. There are no unmediated "variables"— the science/medicine that we need has to emerge from and ultimately help a diverse groups of populations. Indeed, the scientists and health activists speak powerfully to how the questions they believe should be important, are not questions that they can possibly study as tenure track academics who need funding for their work. The "silences" as these scholars describe them are chilling. The diverse voices in these Lab meetings also highlight feminists' varying trust in the biosciences and the scientific method to solve "our" problems. For some it is a question of more resources, asking different questions, and for yet others nothing short of a thorough rethinking of the biosciences will suffice.

In the Critical Perspectives section, six scholars offer us a rich collection of commentaries on decolonization and decoloniality. In their wonderful introduction to the collection, Kristina Lyons, Juno Salazar Parreñas, and Noah Tamarkin insightfully remark that "working against colonialism, imperialism, and white heteropatriarchal supremacy takes many languages and vocabularies." Of particular importance, all the authors remind us that understanding colonialism was/is not a singular project. Rather, different continents and countries have very different histories and it is important that we recognize this heterogeneity in our theorizing colonial and postcolonial projects. They reinforce the idea of "interface" as a critical term that allows us to "teeter" on the boundaries of STS, inside and outside, belonging and not. These analyses coming out of investigations on the decolonial and decoloniality very much reinforces the "fuzziness," the contingency, the partiality, the multiplicity, the heterogeneity that emerge in the rest of the essays. The importance of porous borders and boundaries is an important thread that runs through this collection.

Finally, in the News in Focus section, Mitali Thakor and Stephen Molldrem reflect on the emerging field of Queer Feminist Science Studies (see Cipolla *et al* 2017). Their commentary reminds us of the multiple rich genealogies by which we could construct a QFSS. Newly emerging fields are ripe for understanding the complex and fortuitous paths through which fields emerge, the "thinkers" that come to be celebrated as the "core," and the canon that emerges as key. Official histories and genealogies eventually follow. Claire Hemming's (2010) wonderful *Why Stories Matter* is an important reminder of the importance of the stories we tell about our disciplines. We would do well to heed Thakor and Molldrem to develop and teach more rich genealogies for feminist science studies as well. Rebecah Pulsifer's book review of *Teaching with Feminist Materialisms* explores some of the contours of the debates on feminism and new materialism.

Fuzzying the line between critiquing and researching/experimenting, asking better questions and posing new

"experiments"—thought experiments and wet ones—based on what we know is wrong, being willing to take risks and be accountable to the critiques of our peers: this is the work of feminism's sciences being done and heralded here. Even as FSTS has developed such a rich understanding of science as text, we have struggled to read the textual approaches of critical theory as science. We think there is much potential here and we invite you to read these two special issues together as a collective ensemble of scientific theories, interventions, claims and quandaries. We invite you to mine them for conceptual and methodological tools to extend the projects of science out of feminist theory.

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Notes

[1] See Willey (forthcoming) section titled "A Tale of Two Paradigm Shifts: Or, the Romance of Anti-Essentialist Science and Science-Friendly Feminism"

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