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Mattering

Feminism, Science, and Corporeal Politics

VICTORIA PITTS-TAYLOR

Attention to matter, and *mattering*—matter's ongoing processes of self-generation—is transforming feminist thought. The urgency of attending to matter and *mattering* springs from multiple fronts, three of which I will address here. First, it is stimulated by transformations in the sciences, and importantly, the concomitant naturalization of other fields, where dualisms between the social and the biological are being supplanted by the more monist notion of the "biocultural." Second, attention to *mattering* is made crucial by recognition of contemporary modes of power, including those rendering biological data, matter, and processes into capital, resulting in the production of new kinds of populations and forms of life. Finally, it arises from internal debates in feminist scholarship, where the sustained theorization of the body has come up against the limits of representational paradigms, and where the onto-epistemological questions posed by feminist scientists and in feminist science studies now appear more relevant than ever. In the following discussion, I briefly situate feminist work on matter and *mattering* in its larger intellectual and biopolitical context, and also highlight some of the endogenous concerns feminists bring to the consideration of matter. My primary aim is not to persuade feminist scholars to take a more material or ontological approach to the body, subject, and power. This case has been made elsewhere, sometimes at the expense of recognizing the multiple ways feminists have, in fact, been concerned with materiality. I am more pressed to highlight the utility of feminist (and queer, anti-racist, postcolonial) approaches that take matter seriously in light of broader investments in matter, nature, and bioculture. Many disciplines and fields have newly embraced materialism and ontology, but

a sustained focus of feminist inquiry is power. Feminist orientations demand we ask certain questions of matter/ing and its interlocation. In what ways is matter involved in, or shot through with, sex/gender, class, race, nation, citizenship, and other stratifications? How are these power relations involved in the understanding and management of biology or “life itself,” and how do they materialize in bodies, corporeal processes, and environments? What sorts of theoretical and methodological innovations are required to address matter as thusly situating and situated?

Nature's Becoming

Feminist concerns with matter take place in the context of a much broader intellectual shift that has emerged in the wake of humanism, structuralism, and poststructuralism. This transdisciplinary movement, being described as new or “neo-” materialism, simultaneously naturalizes social thought and redresses modernist ideas about nature. Reacting to the linguistic emphases of much twentieth-century thought, the movement rejects wholly or primarily representationalist accounts of the self and social world, and disallows the strict demarcation of the “social” from the biological. Social theory long defined itself through its investments in the human subject, in symbolic culture, and in representation or discourse. The notions of the mind as intellectualist or abstract, of the subject as built by representational processes, of culture as purely symbolic, and of the body as inscribed through social institutions or power/knowledge give agency to language and culture over nature. These investments may be necessary, *in the face of a fixed understanding of the physical world*, to account for human historicity and diversity, allow for novelty and unpredictability, address inequality and power relations, and envision possibilities for change. Yet, they can also result in an elusory grasp of humans’ fleshly and embodied character, ecological and evolutionary situatedness, biological capacities and non-human entanglements. Representational paradigms, if they exclude matter or render it passive, also preserve the binaries of nature and culture, body and mind, and animality and humanness—dualisms which, it must be noted, feminists, postcolonial scholars, and others have long linked to harms against women and people of color.

If there is a crisis around representation in feminist thought, it emerges specifically out of the project of articulating sex and gender. Even the briefest sketch of this would have to cite *The Second Sex*, where Simone de Beauvoir (1953) details “woman” as a creature who shares physical commonalities—indeed, physical burdens—with other female mammals. However, as she famously insists, biology is not destiny; woman’s character and situation are social products. For de Beauvoir, the specifically human capacity to transcend the (fixed, biological) demands of the species both renders her alienated and also allows her *becoming*. Gayle Rubin (1975) describes a “sex/gender system” that confers social meanings onto biological sex, and later argues the biological body does not establish for sexuality “its content, its experiences, or its institutional forms” (Rubin 1984, 10). Beyond merely transcending the body, Rubin gives culture the capacity to make and remake embodied experience. Poststructuralist feminism offered the more radical claim that the material body, rather than a pre-discursive ground for culture, is in fact produced within and through it. In Judith Butler’s theory of performativity (1990, 1993), biological sex is enacted and stylized through its cultural intelligibility, via the continually repeating performance of gender. Butler re-conceptualizes the material (sexed) body from a fixed entity to an ongoing process animated by signification. This move opens up the problem of how the body itself matters—if, indeed, there *is* a body “itself,” which Butler’s (early) work seems to throw into question.

In his 1996 essay “Mattering,” which inspires this volume’s title, Pheng Cheah responds by asking whether the body has any endogenous quality of dynamism, or if it is only culture that holds the capacity to instantiate its materialization. He contrasts Butler’s view with Elizabeth Grosz’s (1994) account of biology as a source of action, movement, and potential. For Grosz, “Biology cannot be understood as a form whose contents are historically provided, nor as a base on which cultural constructs are founded, nor indeed as a container for a mixture of culturally or individually specific ingredients.” Rather, it is “an open materiality,” but one “whose developments will necessarily hinder or induce other developments and other trajectories.” Like Donna Haraway (1991), who insists on the inseparability or intra-action of these realms, Cheah questions the stability between the oppositions of nature and culture. He de-

mands we “unlearn the distinctions between form and matter, history and nature, the active and the passive that come to us by reflex” (36–37). Echoing Haraway’s notion of the “material-semiotic” and anticipating the work of Karen Barad (2007), Cheah looks to an “as yet unexplored causal relation between intelligibility and matter in general.” Two decades on, this has become a key problematic of feminist thought.

Most broadly, new materialism aims to rethink the terms of social theory, such that the *social* is seen as a part of, rather than distinct from, the natural, an undertaking that requires a rethinking of the natural too. New materialists are interested in exposing the movement, vitality, morphogenesis, and *becoming* of the material world, its dynamic processes, as opposed to discovery of immutable truths. New materialism sees a physical and biological world operating not according to fixed laws and blueprints, but rather one teeming with dynamism, flexibility, and novelty. Such a world is not determined; rather, it is constantly in the processes of its making. The paradigm draws from process philosophy, pragmatism, phenomenology, and other schools, and from figures such as Henri Bergson, William James, Alfred North Whitehead, and Gilles Deleuze, who “resist a simple functionalist reading of evolution” and “oppose strong theories of genetic determination” (Connolly 2011, 792). Although evolution is commonly invoked to defend universal principles of fitness or to justify the status quo, it can be understood as an open, dynamic process. Rather than deterministic, linear, or unidirectional, natural selection can be said to demonstrate the value of mutation, diversity, and deviation in a constantly changing environment. For example, in Grosz’s reading of Darwin, “Beings are impelled forward to a future that is unknowable and relatively uncontained by the past; they are directed into a future for which they cannot prepare and where their bodies and capacities will be open to recontextualization and re-evaluation. It is only retrospection that can determine what direction the paths of development, of evolution or transformation, have taken” (2008, 42). As Janet Wirth-Cauchon examines in this volume, Grosz’s adherence to binary sexual difference and her emphasis on sexual selection limits her account of evolution’s *becoming*. Nonetheless, Grosz’s insistence on the dynamism of evolution means organisms are historicized, not simply in abstract, symbolic, or discursive ways, but in their physical, material, biological existence in space and time. It also points

to the intra-being of humans, non-human animals, and things, their co-becoming within ecological contexts.

The term “new materialism,” as Stephanie Clare notes here, is not adopted by many of the authors whose work is central to articulating matter as such. In the feminist context, the term might even obscure longstanding feminist efforts to theorize materiality, such as work on embodied knowledge and perception, the malleability of biology in response to experience, and the modification of bodies and biological processes in technology and global biocapitalism. (Among the authors in this volume, Sigrid Vertommen, Julian Gill-Peterson, and Lisa Weasel emphasize the limits of feminism’s engagement with matter, while Meißner and Clare underscore the continuities between “old” and “new” materialisms.) The new is best understood to signal not a wholly novel moment for feminism or social theory, but rather a fresh vision of the physical and biological world, engendered through engagement with contemporary scientific fields such as quantum physics, epigenetics, and neuroscience. In quantum physics, for example, elementary entities do not have fixed properties. They can behave as either particles or waves, and they actively take part in their materialization, through their intra-action with (specifically, measurement of) other entities, gaining their characteristics in this process. Thus, “there are no inherently bounded and propertied things that precede their intra-action with particular apparatuses” (Barad in Kleinman, 80). For Karen Barad (2007, 2010), quantum insights inform an onto-epistemology in which the measurement of a thing is inseparable from its ontology—where, in other words, meaning *literally* matters. Barad’s agential realist perspective, discussed below, informs and provokes many of the authors of this volume. (Most of the chapters here began as papers presented at an international conference on the new materialisms, for which Barad offered the keynote address.)¹

New materialism is also animated by research programs in epigenetics and neural plasticity, which stress organisms’ experiences in the present as much as the genetic past. Epigenetics, the study of how gene expression is modulated by interaction with the internal and external environment, is conceived as a bridge between nature and nurture, a medium through which social and environmental experiences materialize at the molecular level. Lisa Weasel argues in her chapter here that epigenetics might be understood in intersectional terms—linked to race, class, and

gender—and claims that its study can help to ground feminist theories of intersectionality. Neural plasticity also suggests biological malleability in response to environmental changes. While the human brain's development was once considered complete in childhood, according to the contemporary view, experience changes the wiring of neuronal circuits as well as the strength of neuronal connection. Collections of neural pathways in specific brain areas can switch tasks. Grey matter in particular areas of the brain can increase in thickness or density in response to learning and repetitive action. Studies of experience-dependent plasticity are interpreted to suggest “the continuous formation and reconstruction of the brain via subjective experience” (Fuchs 2002, 262). This view supplants neuroreductionism and biological determinism with a sense of “the continual, dynamic, dialectical interpenetration of organisms and their environment” (Cromby 2007, 166).

The depiction of brain matter as constantly self-organizing and transformed by experience has been tremendously influential across the disciplines. For example, in analytic philosophy, mind and consciousness are being described as both inescapably neurobiological and radically embodied. Some proponents of “neurophilosophy” are reductionist, defining mind wholly in terms of neurons and neural networks, but others describe the mind as non-reductively physical, comprised of embodied, bodily experience and modified by its environment (Damasio 1996; Fuchs 2002; Prinz 2005, 2008; Clark 2007; Solomon 2007). In cultural studies, theories of synaptic plasticity, via Deleuze, underpin the study of affect, thought not merely as emotion but as the capacity to affect and be affected before and below consciousness, and theorized also as a material force extending beyond the human, circulating between the human, non-human animals, things, and capital (Connolly 2002, 2011; Massumi 2002; Protevi 2009, 2013; Clough 2010). In feminist thought, as Anelis Kaiser's chapter in this volume demonstrates, the brain's plasticity is explicitly positioned to contest theories of innate sex difference and to address the interface of the body, culture, and psyche (Wilson 2004, 2010; Malabou 2008, 2012; Jordan-Young 2010; Fine et al., 2013). This considerably varied literature shares a conception of neurobiological matter as dynamically situated in and entangled with the world.

Contemporary scholarship on matter and mattering enacts multiple shifts in philosophy and social theory. The materialization of social

thought—in the context of a vitalized and dynamic nature—potentially allows the thinking of the social in fleshly, biological and ecological terms, and allows the human (and non-human animal) to be considered in her physical, embodied, and experiential realities. Conversely, it makes possible the consideration of nature and biology as processes of intra-action and relationality, which can take on the unpredictability, novelty, and contingencies once reserved for culture. It reframes the relationship between corporeality and experience. New materialist thought decenters the intellectualist and discursive subject, linking the mind to the experiential, affective, phenomenological, and neurophysiological body. It rethinks the boundary of the human/non-human, and proposes the agentic potential of things, objects, and physical processes. It demands the theorization of Haraway's *natureculture*, where neither part of the term retains its modernist singularity. Ultimately, it also casts doubt on some of the strategies of critical social thought. For instance, social constructionist theories arguably fail to fully address the stakes of contemporary biopolitics and necropolitics, where bodies and biological processes are materially transformed through the capital and state production of populations. So might poststructural approaches, if they limit the analysis of power to questions of intelligibility or the production of the subject (Barad 2007; Bennett 2010; Clough 2012; Puar 2012). However, as Clare explicates, the turn to matter/ing raises a host of new questions for feminists and others concerned with politics, or power, inequality, and suffering.

Mediated Bodies and Onto-Epistemology

While scientific data are sometimes treated as a more or less neutral resource for theorists, for feminists, attention to matter must reckon with its scientific mediation. Critics complain that enthusiasm for the “new sciences” ignores their contradictions and incompatibilities. For instance, in an exchange with William Connolly in *Critical Inquiry*, Ruth Leys protests that affect theorists draw liberally from neuroscience without confronting its reductionist assumptions. In one of her examples, she notes that Connolly, working with Antonio Damasio's neurobiological account of emotions, understands laughter as a “complex, social-cognitive phenomenon” (Leys 2011, 460). Yet for Damasio, laughter is an “automatic

[biological] response to stimuli without regard to the meaning those stimuli might have for us" (*ibid.*).² I make a similar case regarding neuroscientific accounts of mirror neurons, which are widely touted as evidence of the inherent sociality of the brain (Pitts-Taylor 2013). Even while it opens up neural processes to intercorporeality, the strong view of mirroring favored in the neuroscientific literature is reductionist and essentialist, attributing complex phenomena such as empathy to mirror neurons (or mirror systems) alone, and fixing the functions they are thought to support. With respect to genetics, Susan Oyama argues in this volume, "despite much critique, even dismissal, of nature-nurture dualisms, despite increasingly nuanced scientific reports and ever-greater public sophistication about genes, the old queries about the relative importance of biological or cultural causes abound." Meanwhile, feminists are combating overt displays of heteronormative bias in brain studies, where "sex difference" researchers newly armed with neuroimaging technologies are delimiting masculine and feminine traits (understood in binary terms) as the effects of prenatal brain organization (Fine 2010; Jordan-Young 2011; Fine et al. 2013).³ Despite all the talk of neural plasticity, it appears to some neurocognitive scientists that biology is destiny after all.

Feminists have insisted that these incompatibilities and paradoxes be confronted, but even more fundamentally, have cast doubt on ontological claims about biology. While second-wave theorists warned, "we never encounter the body unmediated by the meanings that cultures give to it" (Rubin 1984, 10), feminists working in and observing the lab since the 1980s demystified science as a set of culturally contextualized practices. Feminist accounts of scientific practice underscore the heteronormative and racial biases of researchers, demonstrate the embeddedness of scientific practices in histories of gender and racial oppression, and articulate alternatives to scientific empiricism (e.g., Sayers 1982; Harding 1986; Fausto-Sterling 1992; Birke 1999; Asberg and Birke 2001; Roy 2004; Fujimura 2006; Stengers 2010; Longino 2010). In response to scientific aims of neutrality and objectivity, some feminists, many trained in the sciences, have proposed a more critical empiricism that would include self-reflexivity and accountability to the subjects of research. Feminist empiricism "deeply undercuts assumptions of traditional empiricism," while still maintaining that some kind of truth about the world can be discerned using the scientific method (Harding 1986,

183). Others more thoroughly question the "pre-existence of specific objects before they have been delimited by science in precisely the way they are delimited by science" (Knorr-Cetina 1992, 557). This constructivism does not strictly disallow a material view of the world, but often effectively places ontology outside the reach of critical thought (Latour 2004; Kirby 2008; Wilson 2010).

I will not rehearse the limitations of social constructionism here, except to say that contemporary biopolitics crosses "the epistemic threshold" (Vatter 2009, n.p.); it involves not just the representation but also the government and management of biological life (Foucault 2009). In biopower, matter is meaningful, and meanings are materialized in matter. Not merely inscribed, bodies, organic parts, and biological processes reconfigure themselves in intra-action with institutional forces, such as biocapitalism and securitization. The contributions collected here explore how such forces are racialized, classed, and gendered. They are, for example, entangled with the global structuring of bodies as biocapitalist resources, and with institutional forms of governmentality and control, such as national border policing or the techno prison industrial complex. These forces do not overwrite biological bodies, but they intra-act with them in ways that both reflect and generate power and privilege.

How to reconcile the insights of constructionism with the need to take up the "real," fleshly body, nature, and ontology? This requires modes of seeing the relation between knowledge of matter and matter itself. Barad, like Haraway before her, refuses to demarcate epistemology and ontology. She shows that matter all the way down to the subatomic intra-acts in agentic ways, taking measure and affecting simultaneously. For Barad, reality is the material configuration of *phenomena*. A phenomenon includes not only the object or entity of interest, but also the observer, the measuring apparatuses and the "conceptual-discursive normativity" that shapes the looking. All practices do not equally participate in material configurations, and all accounts do not equally capture a phenomenon. This isn't a slippery slope to relativism. Instead her realism is "reformulated in terms of the goal of providing accurate descriptions of that reality of which we are a part and with which we intra-act, rather than some imagined and idealized human-independent reality" (Barad 2007, 207). Reality for Barad, as Donna Haraway observes, is "not a matter of opinion but of the material consequences of constructing

particular apparatuses of bodily production” (1997, 116). Agentic realism accepts the reality of biological facts without presuming that those facts are simply transparent reflections of the world; on the contrary, facts are certain materialization of matter, against other possibilities or potential facts, and they carry ethical and practical implications (Rouse 2004).

Mattering Now

The problematic of mattering may still need elucidation, but it is by now a powerful thematic of contemporary feminist scholarship. At the close of the first decade of this century, feminist interest in materialism coalesced in the publication of two groundbreaking anthologies (Alaimo and Hekman 2008; Coole and Frost 2010). These volumes engender a critique of dematerialized treatments of the body in feminist thought, on the one hand, and propose alternative models of feminist engagement with biology, corporeality, science, and matter, on the other. The editors make the case for a “renewed” materialist feminism (Coole and Frost) or a “material” feminism (Alaimo and Hekman), distinct from historical materialism, that takes up materiality not simply in social-structural but also in physical, biological, and natural terms. The collected authors variously reflect on the “exhaustion and limits of the linguistic turn” (Colebrook 2008, 52) and identify what is at risk of being obscured or ignored in the focus on representation. In conversation with social constructionist critiques of science (Wilson 2008), and with feminist poststructuralism (Barad 2008), they articulate the need for new orientations toward nature, biology, evolution (Grosz 2008), and physical processes. Some writers also explore the entanglements of power, identity, and the self with the material body, the physical environment, and the ecological world, especially in relation to physical suffering and vulnerability, pain, or loss (Bost 2008; Mortimer-Sandilands 2008; Siebers 2008). The gaps between what are experienced as bodily realities and representations of them in both feminism and science beg for a rapprochement between physical and cultural accounts of the body.

If those volumes aimed to define and justify a new intellectual movement, the task has already matured to some degree. Materialism is pervading many realms, and the question now is not whether feminists should take it up in some way, but how they are doing so, and with what implica-

tions. While the case for an ontological turn, an embrace of matter, a material grasp of the body, and a post-humanist orientation have each been vigorously championed, the implications of these for feminist knowledge, theory, and praxis—and engagements with science—are not yet fully realized. How relevant are hard-fought critical frameworks and conceptual resources—the emancipatory aims of historical materialism, the theory of situated knowledge, or the feminist conception of intersectionality, for example—in the study of matter? Does the turn toward molecules and atoms, non-human animals and objects, and away from the human subject, render them less tenable? What kinds of politics are enabled (or disabled) in posthumanist thought? What sorts of methodological challenges are raised by attention to *phenomena*, rather than objects, and by human and non-human assemblages such as multi-species entanglements?

One line of inquiry, explored here in part I, *Probing New Theories of Matter*, furthers the discussion begun in the aforementioned volumes of the intellectual stakes of the new materialist turn. To begin, Roy and Subramaniam question the novelty of materialism in feminist thought. Far from ignoring or dismissing biology, they argue that feminists in science studies have long invested in the “bios,” even as they have questioned the “logos.” They also interrogate what sort of matter is reclaimed in new materialist thought—is it abstract, generic, and universalizing, or particular and situated? Drawing from postcolonial theory as well as science studies, they argue for seeing materiality as utterly inextricable from power and privilege, and as specifically enacted in actual and differentiating conditions and contexts. They write: “if there is no generic ‘universal woman, then there can also be no universal or generic ‘body’ or ‘matter.’” The other chapters in this section also critically assess the materialist turn and look to expand its foundational literatures. Stephanie Clare’s chapter, discussed below, compares the works of Barad and Jane Bennett, and Wirth-Cauchon’s chapter asks how much is achieved by Grosz’s reworkings of evolutionary theory. Finding the latter’s reading of Darwin to be both enormously fruitful and stubbornly heteronormative, Wirth-Cauchon turns to Luciana Parisi, who places evolutionary thought in the context of technological transformations, including those that destabilize binary sex difference and reproduction (see also Clough 2012).

The shift toward matter and ontology allows a decentering of the human subject and her epistemic capacities, in favor of recognizing the

material agency of things, non-human animals, systems, networks, molecules, and atoms. What happens to conceptions of power and agency in this shift? Hanna Meißner explores the relation between “old” and “new” materialisms, and asks after the emancipatory ideals of the former in light of the post-humanism of the latter. She notes with reference to Marx that “to question something is not to fundamentally do away with it,” and envisions the lessons of new materialism as expanding rather than restricting emancipatory aims. In her chapter found in part III of this volume, Sigrid Vertommen applies such a cross-materialist approach to examining female tissue donations in the stem cell industry. The new materialist approach would cite not only the female body of the donor but also the researcher, the embryo, the laboratory tools, and other non-human actants as co-producers of stem cell lines, whereas the Marxist feminist approach would look to the gendered, classed, and racialized stratifications of biocapitalism to address the production of new forms of biovalue. Vertommen offers a sustained comparison of the two paradigms and comes to a proposal similar to Meißner’s, “to pro-ductively and diffractively use the permanent tension between these two ostensibly contradictory feminist materialist paradigms.” Clare also addresses the stakes of post-humanism, specifically its treatment of things and non-human animals as agentic actors. She proposes that some ver-sions of post-humanism are more hospitable than others to a political framing. Clare favors a view of politics as distinctly human, but suggests that new materialism forces a rethinking of what the human is, and her autonomy from the non-human. In various ways, the chapters in this section engage in diffractive readings of theory in order to confront the political implications of materialism.

A second line of inquiry explores the relevance of feminist theories to the scientific study of biological bodies and vice-versa. Do contemporary modes of scientific inquiry, such as evolutionary biology, genetics, epigenetics, and neuroscience, really foster nuanced understandings of matter/ing as multiple, dynamic, and open? Further, are they compatible with feminist models of gender/race/class and other stratifications, and if so, how are these revealed at the level of biological systems, genes, or molecules? If not, what innovations are needed in both scientific practice and feminism to think power and ontology together? Part II, *Nature/Culture in the Twenty-First Century Sciences*, engages with spe-

cific research programs in the sciences, beginning with Susan Oyama’s discussion of genetics. Somewhat ironically, Oyama describes how the treatment of biological processes as information in the biological sciences enacts their de-materialization. In contrast to a view of development as driven by information, she champions its contextual, emergent materiality, a view better afforded by developmental systems theory. Lisa Weasel highlights epigenetics as a field amenable to material feminist theorization, and more specifically, proposes reading epigenetics through an intersectional feminist lens. The modifiability of gene action in response to experience suggests embodied intersectionality—“the ways in which multiple, simultaneous social constructions feed off of and into material networks and be-comings, collaboratively back and forth again.” However, she argues that we have yet to see many practical, materially grounded explorations of intersectionality, and asks whether epigenetics can “enact an intersectional sociomaterial politics consistent with feminist goals and experience.”

The other two chapters in this section take up neuroscience, particularly with respect to the problems and promises of neural plasticity. An-elis Kaiser examines neuroimaging research as a contested site for the exploration of sex/gender in material terms. In challenging empirical accounts of dichotomous sex in the brain, Kaiser finds in Butler and Barad resources for considering brain matter “in its active-agential and performative doing”—that is, in its sex/gendered becoming. Neural plasticity, she argues, can be seen as a neuroscientific equivalent of performativity, a continual enactment of becoming that depends upon repetition for its appearance of stability. Kaiser questions Barad’s agential realism for its refusal to distinguish between living and non-living matter. Does the theory work equally well for neuro-matter as for subatomic particles? Is it problematic to give independent agency to “subcortical matter itself”? Despite her misgivings, Kaiser draws from Barad’s ethical onto-epistemology to address the making of gender as a biomaterial reality in the neuroscience lab. In contrast to Kaiser’s treatment of neural plasticity as a resource for queer theorizing of the brain, for Schmitz, plasticity is a double-edged sword. On the one hand, it enables a view of the body as biologically malleable and historicized in response to experience; this is the plasticity embraced by feminists. On the other, it fosters the cerebral subject, understood as driven by and reducible to brain

processes, and underpins neuro-governmentality; this is what Schmitz understands as “modern neurobiological determinism.” The paradox of plasticity—the malleable cerebral subject reduced to the brain—plays out in the brain/body’s intra-action with technical apparatuses, examined here with reference to Brain-Computer-Interfaces (BCI). Schmitz identifies the multiple agencies at work in the realization of neurally transformed “brainbodies” through BCI. “Who decides,” she asks, “on intelligible codes, on form, content and processes of these communications? Who has the power to define which information processing is more favorable than others?”

Schmitz’s chapter segues the volume into part III, *Biopolitics and Neopoltitics*. The chapters in this section examine the material stakes of scientific and technological practices, their complex entanglements, and their differential and differentiating effects on the lives and prospects of living beings. Josef Barla looks at the use of biometrical identification technologies for transnational border policing and identity control in the UK Border Agency’s Human Provenance Pilot Project. This ill-fated national security project, begun in 2009, attempted to find markers in DNA and isotopes from mouth swabs, hair, and nail samples to verify the ethnicity and nationality of asylum seekers. Rather than viewing the biotechnologies as either neutral resources or singular instruments of control, Barla sees them as intra-acting with biological processes and sociopolitical forces that work to racialize and nationalize bodies. Together, these constitute what Haraway (1991) and Barad (2007) call apparatuses of bodily production, within which, he argues, bodies behave as “potentially unruly actors” that are not passively inscribed, but rather take part in their own materialization. Just as Barla is interested in the “differently configured bodies” emerging out of such intra-actions, Teena Gabrielson argues for the plurality of bodies in the history and practices of toxicology. She traces a shift from investigation into the nature of substances (as poisons) to effects of toxins (as degrees of harm), and ultimately to assemblages of people, workplaces (factories and farms), animals, chemicals, machinery, legislation, and public health. The apparatuses of the contemporary toxic body, she argues, work to mask the uneven distribution of toxic exposure and harm to the detriment of poor communities most affected.

The next two chapters extend Schmitz’s discussion of neuro-governmentality with attention to psychopharmaceuticals. These insinuate the molecular both into “technologies of human development” via the treatment of childhood ADHD and into technocorrections via the drugging of prisoners. The “mass medication” of children for ADHD, Julian Gill-Peterson argues, opens bodies up to constant augmentation and bio-mining for “infinitely extractable future value through overlapping fields of modulation.” Gill-Peterson links the neurobiological modulation of attention both to neoliberal norms of performance and to “sexed and racialized standards of plasticity, eugenically eligible for improvement.” Rather than reject brain-based or material accounts of cognition and attention, as some critics of medicalization do, he argues for a neurofeminist, eco-pharmacological approach that can trace the differential distribution of neurobiological capacities and affects. In their discussion of psychotropic use in prisons, Anthony Hatch and Kym Bradley demonstrate the close proximity of bio- and necropolitics. The administering of psychotropics as chemical restraints signals “new relations of biopower that have turned against life.” The practices, they argue, call into question not only the political rationale of mental health treatment in correctional institutions, but also the “ontological space that separates waking life from certain death.” These and other chapters in this section demonstrate the urgency of a specifically feminist, anti-racist materialism.

In the final section, *New Materialism and Research Practices*, three chapters address the methodological challenges raised by attention to matter/ing; they echo and extend methodological innovations in feminist science studies that distribute agency across the human and non-human. Mary Kosut and Lisa Jean Moore’s api-ethnography, for example, recalls Evelyn Fox Keller’s account of Barbara McClintock’s “feeling for the organism.” Kosut and Moore conduct a study of urban beekeeping, a trend that has emerged as a response to the crisis of widespread colony collapse created by industrial agriculture, monocropping, genetic modification, pollution, and global trade. Recognizing their existing entanglements, Kosut and Moore use ethnography to grasp the embodied, material transformations created in api-human contact. They attempt to know and feel, without anthropomorphizing, the non-human, high-

lighting the ways “hive-minds” challenge human-centered, individualist ideas of agency. The final two chapters address methods, following Haraway and Barad, as material-discursive practices that are part of the phenomenon they appear to merely observe. Natasha Mauthner shows how the feminist method of narrative analysis does not merely represent but rather enacts the realities under investigation. Mauthner undertakes a “diffractive genealogy” of the method to imagine its posthumanist performative possibilities. Marsha Rosengarten utilizes the apparatus of bodily production to explain how body-subjects of research actively participate in their own materialization. Rosengarten addresses randomized control trials of HIV prophylactic drugs. In these experimental studies of vulnerable populations, “failures” are attributed to recalcitrant subjects who refuse to adhere to trial protocols. Rosengarten argues instead that research practices utilizing biomedical interventions co-produce their own experimental subjects who “kick back.”

While feminism’s turn to matter has necessarily generated a state of reflexive retrospection about its theories of sex/gender, the biological body, and the mediations of science, the aim is not really more nuanced, abstract theoretical perspectives, the overcoming of epistemic impediments to grasping nature, nor even the ontology of matter per se. Rather, it is the concrete, particular, and situated lives of beings as they are caught up in the workings of power/knowledge/ontology. The authors here expose mattering’s differential distributions and its confluences within bio- and necropolitical forces. The complex relations of technological research and global capitalism, biosecurity, technocorrections, governmentality, pharmacology, toxicology, global health and environmental crises, and racialized, sex/gendered relations of power comprise just some of the situations in which matter becomes itself, while also playing roles as actants that co-produce it. As opposed to a universalized or generic mattering, feminists can help to elucidate its specificity and particularity, and to reveal the stakes of doing so.

NOTES

- 1 The *Mattering: Feminism, Science and Materialism Conference* was held at the Graduate Center of the City University of New York, February 14–15, 2013. This conference, organized jointly by the Center for the Study of Women and Society, the Committee on Interdisciplinary Science Studies, and the Advanced Research

Collaborative at the Graduate Center, addressed feminist perspectives on the onto-epistemological questions raised by the materialist turn.

- 2 In response, Connolly advocates positive engagement with neuroscientists whose work is generally amenable to cultural theorizing.
- 3 The absorption of gender into the brain does not, in this instance, suggest its material performativity (Dussauge and Kaiser 2012; Kaiser this volume; Pitts-Taylor 2016), but rather reverts to a modernist idea of sex/gender as fixed in nature.

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PART I

Probing New Theories of Matter