Plasmodial Improprieties

Octavia E. Butler, Slime Molds, and Imagining a Femi-Queer Commons

AIMEE BAHNG

> I consider myself a creature of the mud, not the sky.
>
> DONNA HARAWAY

WHEN FEMINIST-QUEER SCIENCE STUDIES LOOKS FOR ALTERNATIVE models for being in the world that move beyond the human, we would do well to consider the work of African American science fiction writer Octavia E. Butler,[1] who dedicated her life to imagining worlds otherwise through the generic medium of science fiction.[2] This paper posits Butler as a black feminist philosopher of science, who used the genre of speculative fiction to formulate nonhierarchical socialities and even more radical onto-epistemological modes of living in common, often through feminist ideas of collaborative praxis and queer notions of kinship.

Drawing on my archival research of Octavia Butler's collected papers at the Huntington Library, I point to Butler's unpublished research notes on slime molds and other nonhuman organisms as an example of thinking beyond the human prior to the more recent turn to new materialisms. Butler's approach to slime molds and what she learns from them, I argue, model modes of engagement with other life-forms that come from practiced thinking with alien-human entanglements. While Butler has emerged as one of the most celebrated black feminist science fiction writers in the world, in this paper I argue that the imaginative possibilities her writing and research practices engender constitute an example of feminist scientific inquiry we could call speculative fabulation. Fabulation spans

the space between what speculative realists tend to position diametrically as the sheer ideation of the linguistic turn and the realism of matter (Bryant, Srnicek, and Harman 2011, 3; Meillassoux 2008, 5). It demands of its practitioners what Sara Ahmed might characterize as queer disorientation (2006). I interject Butler as a thinker who anticipates many of the recent critical moves beyond the human in feminist and queer theory, and I posit her literary works as theoretical interventions to these conversations that take into consideration histories of empire and slavery as phenomena at the planetary scale.

To begin, I focus on Butler's encounter with slime molds and how she begins to think about alternative ontologies and systems of organizing. Highlighting Butler's extrapolations from slime mold behavior to explore alien, human, and alien-human relations in her speculative fiction, I argue that Butler's fabulation of "xenogenesis" in her eponymous trilogy models an openness to the uncertain movements beyond the human that nonetheless foreground and stay attuned to power imbalances that too often narrow the possibilities of becoming. While Butler's thought experiment could be put into conversation with what Donna Haraway (2016) and Karen Barad (2007) respectively call "sympoiesis" or "intra-action," Butler's tale of xenogenesis suggests a deep imbrication of colonial modes of acquisition and genetic engineering as a science we have come to know in the US within the context of a capitalist, entrepreneurial mode of scientific research. Through a reading of Butler's fictional construct, I chase the implicit question: What would a feminist, decolonial genomics look like? Situating slime mold as a recurring player in feminist-queer science studies, I put Butler's research in conversation with Evelyn Fox Keller's work on slime mold reproduction and movement from the late 1960s through 1983. Together, Butler's notes and fiction provide a rich, alternative archive for feminist-queer science studies to examine as the field continues to focalize collaborative and collectivist frameworks for conducting science queerly.

But it won't all be utopian praise for slime mold. Starting from a moment of archival discovery, of thinking across time and space with Octavia Butler, this essay moves through some initial excitement about Butler's interspecies thinking to consider the more recent hype around and instrumentalization of slime mold in popular science as well as in speculative realist scholarship. While Butler's research into slime mold

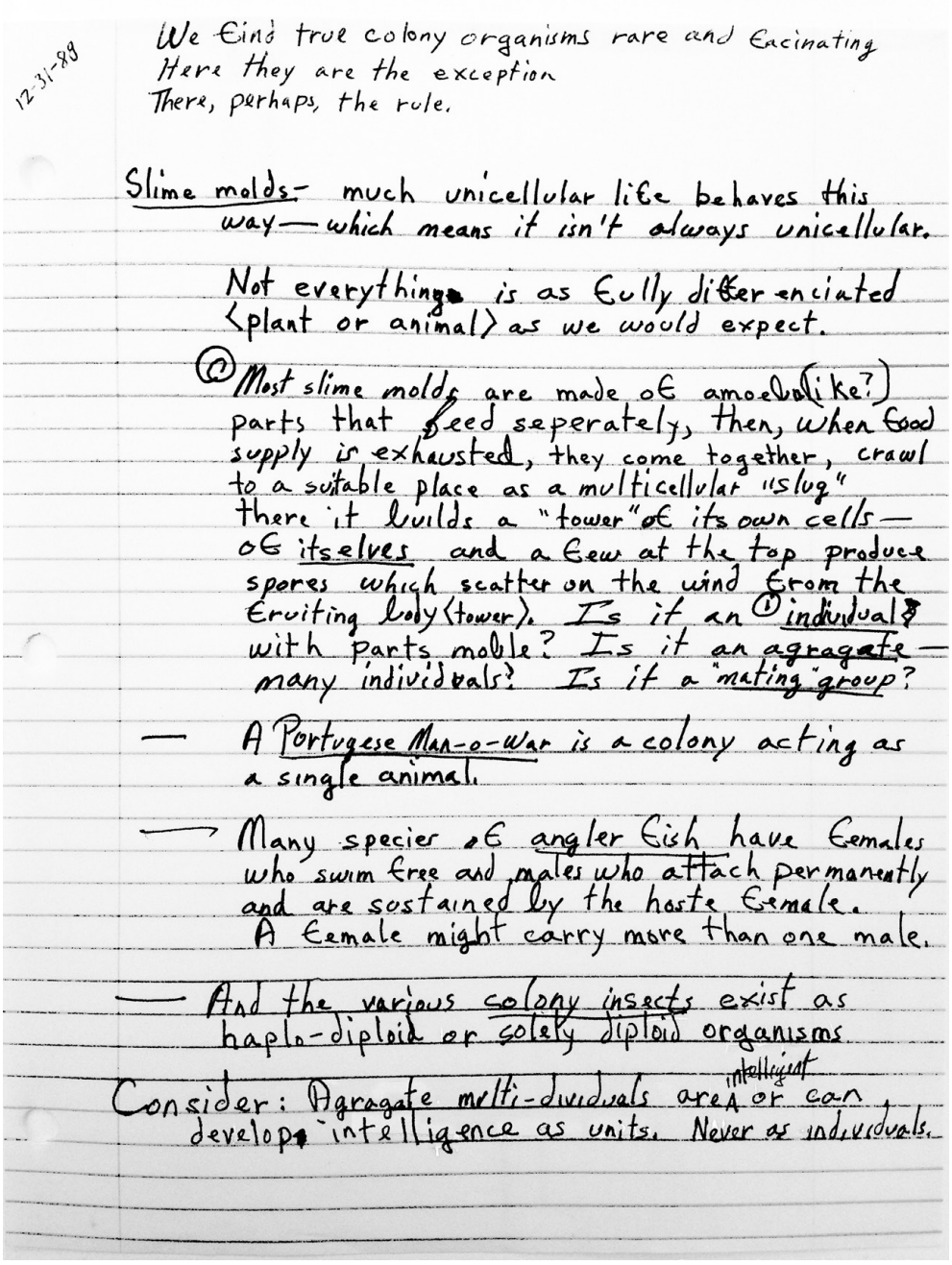
and other colony organisms indicates her interest in models of collective action, decentered modes of self-organizing, and systems of collaborative production, slime mold becomes, in the era of financialization and its attendant fields of probabilization and preemption, subject to more predatory forms of speculation. Swept up into a culture of optimization and risk aversion that celebrates its efficiency rather than its queerer characteristics, slime mold gets oriented toward models of competition when entrepreneurial technoscience asks it to perform spectacularized performances of problem-solving efficiency and adaptability.

In the final moves of the paper, I return to Butler and the slime mold, demonstrating how, despite her interest in its resistance to the atomizing proclivities of property, propriety, and privatization, she curbs her enthusiasm for colony organisms with a wariness around all-too-human systems of power that might confuse "emergence" for "colonization." Out of Butler's trepidation, I argue for the importance of keeping decolonial thought a part of feminist new materialist inquiry. Butler understands, on the one hand, that differentiation can fuel capitalist operations by cultivating the conditions for competition, and yet, on the other hand, that complete disregard for difference too often obfuscates power dynamics already in play even in the sympoietic moment. But first, let's join Octavia at the moment when she begins thinking about slime molds and other colony organisms.

The Impropriety of Social Amoebae

In Box 83, Folder 1625 of the Octavia E. Butler papers, housed at the Huntington Library in San Marino, California, a single note about slime molds surfaces (see opposite). Dated December 31, 1988, the note generally catalogs a number of colony organisms, such as the Portuguese man-o-war and the anglerfish. In multicolored pen on a lined index card, Butler has written: "We find true colony organisms rare and facinating [sic]. Here they are the exception[.] There, perhaps, the rule."

What is the "there" to which she refers? Not the soil through which slime molds travel (up to one centimeter per hour!), nor the sea depths where the female anglerfish "might carry more than one male" on her back. It is an elsewhere, a speculative space where someone—in this case, perhaps the most treasured black feminist speculative fiction writer of all time—can begin to imagine an otherwise. If "here" references a world


12-31-88

We find true colony organisms rare and fascinating
Here they are the exception
There, perhaps, the rule.

Slime molds- much unicellular life behaves this way—which means it isn't always unicellular.

Not everything is as fully differenciated (plant or animal) as we would expect.

@ Most slime molds are made of amoeba(like?) parts that feed seperately, then, when food supply is exhausted, they come together, crawl to a suitable place as a multicellular "slug" there it builds a "tower" of its own cells—of itselves and a few at the top produce spores which scatter on the wind from the fruiting body (tower). Is it an ① individual? with parts mobile? Is it an agragate—many individuals? Is it a "mating group?

— A Portugese Man-o-War is a colony acting as a single animal.

— Many species of angler fish have females who swim free and males who attach permanently and are sustained by the host female. A female might carry more than one male.

— And the various colony insects exist as haplo-diploid or solely diploid organisms

Consider: Agragate multi-duviduals are intelligent or can develop intelligence as units. Never as individuals.

Slime mold speculations. "Notes on Organisms," December 31, 1988. Box 83, Folder 1625, Octavia E. Butler Papers, Huntington Library, San Marino, California.

processed through the hegemonic filters of what some may call human civilization, Butler's "there" gestures toward other worlds: of slime molds and anglerfish, of organisms that belie taxonomic kingdoms, of life-forms and lifeways that elude our current frameworks. This note on slime molds, I contend, documents queer feminist science (fiction) in the making.

On slime molds specifically, Butler's note focuses on their queerness:

> Slime molds– much unicellular life behaves this way—which means it isn't always unicellular. . . .
>
> Most slime molds are made of amoeba(like?) parts that feed seperately [sic], then, when food supply is exhausted, they come together, crawl to a suitable place as a multicellular "slug[.]" [T]here it builds a "tower" of its own cells—of itselves[—]and a few at the top produce spores which scatter on the wind from the fruiting body <tower>. Is it an agragate [sic]—many individuals? Is it a "mating" group? (Butler 1988, emphasis in original)

Essentially an undifferentiated sack of multinucleated protoplasm, the cellular slime mold *Dictyostelium discoideum* has no brain, no central nervous system—and yet, in conditions of scarcity, it will swarm, intelligently reconfiguring itself into multicellular masses, working in tandem temporarily to proliferate, spread, and relocate to more generative sites. The slime mold defies Linnean taxonomization, as it cannot be easily categorized as animal, plant, mineral, or even fungi, leaving contemporary scientists to relegate the hundreds of species of slime molds to kingdom Protista, a kind of catchall kingdom of "others." Unsettling scientific classification, the slime mold even belies strict adherence to grammatical rules. In writing about slime mold, one can slip between singular and plural forms at every reference with due cause, as both cellular and plasmodial slime molds exist alternately as singular and plural, depending on how and when you're counting. Wondering whether slime mold is best characterized as an aggregate of individuals, a mating group, a swarm, or a single organism, Butler meets the question of pronouns with an admirable openness, queering and querying the limiting politics of either individualism or collective action. Describing the fruiting body as "a 'tower' of its own cells—of itselves," Butler bends grammar to accommodate this alien ontology, asserting the organism's nonconforming, decentralized organization. Butler's methods constitute queer science studies approaches. By fully recognizing the alien possibilities of this life-form—by insisting that not all unicellular life is always unicellular, and by meeting slime mold morphology in between singular and plural in its grammar—Butler demonstrates a remarkable openness to non-normative biological

organization. She does not look to figure the slime mold out. She seems excited to follow it off the script of 1980s evolutionary biology to other possibilities. In slime, she looks for a model of life that could be, rather than life that already is. It is a speculative fabulation, drawn from life unruly.

Butler's inquiries into slime molds and what she calls "multi-dividual units" coincide with some of the key questions she raises around human-alien relations as well as nonhierarchical social structures in her three novels *Dawn* (1987), *Adulthood Rites* (1988), and *Imago* (1989), which comprise the so-called Xenogenesis trilogy, collected in 2000 in a single volume titled *Lilith's Brood*. Descriptions of slime mold behavior often focus on its anomalous self-organizing, which requires systemic morphing between single-celled and multicellular forms:

> *Dictyostylium* has the remarkable property of existing alternatively as single cells or as a multicellular organism. As long as there is enough food around, the single cells are self-sufficient, growing and dividing by binary fission. But, when starved, these cells undergo internal changes that lead to their aggregation into clumps which, as they grow bigger, topple over and crawl off as slugs. (Keller 1983, 516)

The transformation of "self-sufficient" cells into aggregated clumps and slugs could well describe the bodies of the Oankali, the alien species depicted in Octavia Butler's Xenogenesis series. The Oankali, who arrive at a postapocalyptic Earth and "save" a small group of humans for the potential of their genetic material, are covered in head and body tentacles that function as sensory organs. In times of stress, they knot up into clumps. One might also recognize slime mold chemotaxis in the walls and floors of the Oankali ship, which Butler describes as a living organism that digests and recycles its inhabitants' waste and communicates with them through biochemical signatures and feedback loops. Indeed, Butler has often fabulated species that embody symbiogenesis, which highlights cooperation rather than competition in describing the organization and evolution of complex life (Ferreira 2010; Vint 2010).

In Butler's fictional world, acclimating to this alien ontology requires an active queering of human sexuality vis-à-vis the third-gender "ooloi" of the Oankali. The ooloi anchor the mating ecologies among male, female, and non-Oankali participants who enjoy the benefits of genetic therapy

and chemically stimulated pleasure. Lilith, who joins an Oankali family with an ooloi named Nikanj, helps Nikanj undergo the "internal changes" that humans might associate with puberty. Like a slime mold undergoing its transformation from unicellular to multicellular organism in a time of stress, Nikanj finds temporary relief in foraged food: "It drew its head and body tentacles into knots," Butler writes. "'Give me something else to eat.' [Lilith] gave it a papaya and all the nuts she had brought in. It ate them quickly. 'Better,' it said. 'Eating dulls the feeling sometimes'" (Butler [1987] 1997, 103). In fabulating the Oankali, Butler has drawn much from what could be considered slime mold's queerest properties: nondimorphic sexuality, trans-species chemo-tactile communication, and nonhierarchical sociality. In these ways, slime mold behavior itself speaks to femi-queer notions of collectivity and nonhierarchical social formations. Remarkably, researching slime mold behavior also leads directly to the very heart of feminist science studies in its emergence as a field.

In 1969, feminist physicist Evelyn Fox Keller, along with mathematician Lee Segel, looked to the slime mold as a demonstrable example of spontaneously emergent, self-organizing principles. Their preliminary research, though, was largely abandoned by the scientific brotherhood in favor of the so-called "pacemaker hypothesis," which suggested that a centralized authority, composed of special pacemaker or "founder cells," ordered other cells to aggregate. Despite the complete lack of evidence for the existence of such cells, the pacemaker hypothesis was upheld as conventional scientific knowledge throughout the sixties and seventies. In 1983, though, Keller definitively overturned this hypothesis with the help of developments in mathematical biology, including the study of nonlinear reaction-diffusion equations, which provided a means of understanding the interaction between the production and diffusion of acrasin and cellular chemotaxis. Chemotaxis, Keller revealed, *not* special founder cells, directs slime mold aggregation and movement. In her article, Keller exposes the extent to which scientists had imposed hierarchical and ultimately patriarchal structures of thinking onto cellular slime mold. To "posit a single central governor," she writes, was to subject scientific inquiry to a "zealous desire for familiar models of explanation, . . . imposing on nature the very stories we like to hear" (1983, 521).

Though many scientists sheepishly admit enjoying science fiction, many often disavow any significant influence cultural texts might have on

the work they do in the laboratory, despite the common emphases on speculation and experimentation shared by scientists and science fiction writers alike (Haraway 1991; Milburn 2010; Shaviro 2016; Bahng 2017). Feminist science studies scholar Banu Subramaniam has called for "more engaging plots and stories that are located in the interdisciplinary fissures of the sciences and the humanities" (2014, 72).

At the conjuncture of science and fiction, Octavia Butler's speculative fabulation instantiates just such an assemblage of transdisciplinary knowledge making. Reading Butler's speculative fiction alongside scientific research on slime molds, one can begin to trace the entangled fictional and nonfictional stories of how human and nonhuman species organize themselves. One can begin to track the narrativization of human exceptionalism in the conventional story of life itself. And because slime molds lead us away from systems of hierarchical ordering, the story of how humans have tried to shoehorn slime into a more familiar form reveals how storytellers of science become susceptible to their own frameworks. In other words, while there may very well be a slime mold ontology beyond human understanding, one ethical way to reach across to that speculative reality might be to *wonder with* it, rather than *marvel at* it from a distance. In this way, considering Butler's work moves the new materialist conversation from trans-species allyship to multispecies solidarity, and in so doing, advances a feminist queer materialism as threaded through cross-ethnic antiracist work. Such consideration puts Butler's fabulations and Evelyn Fox Keller's research on slime mold aggregation in a more capacious feminist genealogy of nonhierarchical organizing that might include, for example, Jasbir Puar's theorization of political assemblage (2007), or Occupy, or #BlackLivesMatter theories of decentralized and nonhierarchical organizing.

Butler's study of the slime mold's transversal movement across and through single- and multicellular identities challenges notions of propriety, the proper, and the proper noun: She crafts the particularly queer pronoun "itselves" to describe slime mold differential collectivity. Slime molds organize themselves somewhat spontaneously and collectively. As Steven Shaviro describes it, the slime mold is "a *collective* without individuals, without any specialized parts, and without any sort of articulated (or hierarchical) structure" (2016, 195). Also called "social amoebae," slime molds, with their distributed modes of organization, constitute a radical

departure from hierarchical organizational systems and also confound notions of privatization. Butler spent most of her time in public spaces—in public libraries and on public transportation. Indeed, her dyslexia made her nervous about driving, so the bus became a way for her to navigate the LA sprawl while also affording her the time-space in which to imagine the world in ways that transected the rather segregated neighborhoods and logics of privatization rapidly engulfing much of the Southland into racial and class enclaves.[3] Most of Butler's scientific research and thinking happened during her hours commuting on the bus to her various factory and temp jobs, or during her frequent trips to the Central Library. Even in 1988, at the accelerated turn of science into private funding, Butler was taking science back to public spaces.

Written on New Year's Eve, Butler's slime mold note falls at the cusp of multiple transitions. For one, 1988 is when she was wrapping up the Xenogenesis series and moving her thinking toward the Parable series and what would become a religious fabulation called Earthseed. The plasmodial improprieties that slime molds enact through channels of connectivity might also remind readers of Butler's grappling with notions of private gated communities and alternative possibilities for communal living, as well as Lauren Olamina's hyperempathy syndrome, from the Parable series. The timing of Octavia Butler's research on slime molds also coincides with the pinnacle of Reagan- and Thatcher-era financialization, deregulation, and privatization. The late '80s is precisely the era in which we see the financialization of science in particular, when, as Melinda Cooper has demonstrated, venture capitalists started funding scientific research largely based on its promise of deliverable goods that could be sold to a consumer culture being trained toward constantly upgradeable selves (2011). This form of speculation produces probable states as calculable outcomes in investment contracts (futures, options, swaps) and choices for individual portfolios (Bahng 2017). Such packaging *forecloses* alternative possibilities in the interests of a precise rate of return. Butler's speculations are more creative (Bahng 2017). They learn to learn from other human and nonhuman actors. They don't abide the proprietary norms of intellectual production in the era of the corporate university. No silos. No atomization. Just concatenation.

In slime mold–Oankali-Earthseed aggregation, I contend, Butler begins to experiment with forms of communing perhaps most akin to

feminist Marxist formulations. Silvia Federici, for example, proposes a commons that exceeds human social sortings: "Indeed, if communing has any meaning, it must be the production of ourselves as a common subject [itselves]. This is how we must understand the slogan 'no commons without community.' But 'community' has to be intended not as a gated reality, a grouping of people joined by exclusive interests separating them from others, as with communities formed on the basis of religion or ethnicity, but rather as a quality of relations, a principle of cooperation and responsibility to each other and to the earth, the forests, the seas, the animals" (2012). But Federici's move away from communities of humans toward a set of relations among humans, animals, and the environment seems to propose a moving beyond "the subject" that fails to consider processes of subjection. In Butler's *Parable of the Sower* (1993), the gated community to which Federici gestures in this quotation clearly does have its limitations. In the near-future world in which Lauren Olamina founds Earthseed, the gated community is a failed remnant of private interests, but Earthseed, which replaces it, remains conflicted with very human forms of power. It is no utopia.

Decolonizing *Physarum polycephalum*

Slime molds have been made much of in recent popular science news headlines, as everyone from computer scientists to city planners began modeling the adaptive behavior of *Physarum polycephalum*—not a cellular but a plasmodial slime mold (aka myxomycete)—as part of a turn toward more complex, algorithmic methods for prediction and speculation. When presented with oat flakes arranged in the pattern of Japanese cities around Tokyo, *Physarum polycephalum* constructed networks of nutrient-channeling tubes that were strikingly similar to the layout of the Japanese rail system (Sanders 2010).[4] The telecom industry, which increasingly relies on so-called "emergent software" to plan how to lay down subterranean cable infrastructures most efficiently and with minimal disruption, has also turned to slime mold–based modeling, as the plasmodial organism lays down not only efficient pathways but also networks that stand the least chance of disruption should one strand be compromised or temporarily severed (Gorby 2009; Keim 2008). The plasmodial slime mold has become such a key modeling agent in commercial and scientific research

that it has been used to "grow a computer" and was part of an experiment to predict Mexican migration patterns across the US (Adamatzky and Martinez 2013). As of 2014, slime molds are even now being bred and raced for entertainment (Hotz 2014).

While slime molds may offer some alternative to ways of organizing, there is reason to pause the celebration of the liberatory potential of the social amoebae. Innovators and entrepreneurs have folded slime molds into the workforce as experimental bodies, picked up for their efficiency and utility, but not for their queerness. If we hear an echo of the Oankali collective in Butler's note on slime molds, we would do well to remember that the Oankali, though far advanced in communicating across species lines and pushing beyond human notions of individuality and collectivity, were not without their coercive aspects. As "gene traders," the Oankali roamed the universe as scientific prospectors, mining for genetically valuable material. One of them, Jdahya, explains: "We do what you would call genetic engineering. . . . We *must* do it. . . . It is part of our reproduction, but it's much more deliberate than what any mated pair of humans have managed so far. . . . We're not hierarchical, you see. We never were. But we are powerfully acquisitive. We acquire new life—seek it, investigate it, manipulate it, sort it, use it" (Butler [1987] 1997, 39). The Oankali may claim to be nonhierarchical, but they approach the universe through frameworks of usability. As gene traders, they inhabit a capitalist, colonialist mindset of mergers and acquisitions in which "the merge" never quite takes place across even footing.

Butler's nuanced depiction of the Oankali as nonhierarchical but powerfully acquisitive is indicative of how her interest in the slime mold differs from that of entrepreneurial technoscience. Slime mold modeling in the service of capitalist technological innovation emphasizes efficiency, and its promise as projected by popular science media marvels at the alien intelligence of such a "primitive" species. The novelty of the story lies in the surprise humans have at nonhuman intelligence and how that intelligence can be harnessed to serve human interests. Such a relation reproduces a colonialist version of trans-species exchange and sustains fascination as a means of reinforcing human supremacy in species hierarchy.

At a moment when state and corporate project managers are looking to slime molds for direction in constructing self-organizing and cost-efficient networks in the real world, what can we learn differently from these

problem-solving experimental subjects? Reading Butler's work through black, queer, decolonial studies provides a way to interrogate the processes of subjection into which slime molds have been called. There's a long history of scientific experimentation on people of color, and Butler's awareness of this racialized history leads her to a consideration of a trans-species set of solidarities. Lilith, the black protagonist of *Dawn*, understands this when she contemplates how the Oankali have subjected humans to a form of genetic experimentation:

> This was one more thing they had done to her body without her consent and supposedly for her own good. "We used to treat animals that way," she muttered bitterly. . . . "We did things to them—inoculations, surgery, isolation—all for their own good. We wanted them healthy and protected—sometimes so we could eat them later." (Butler [1987] 1997, 31)

Through Lilith's reflection on animal experimentation in the medical and meat industries, Butler asks us to consider what it means to rethink futurity from a multispecies undercommons. After all, Lilith likens Oankali gene trading not only to the meat industry but also to slave history: "Humans had done these things to captive breeders—all for a higher good, of course" (Butler [1987] 1997, 62). In slime mold, Butler may see a model for collective politics rather than merely problem-solving potentiality,[5] but she stops short of suggesting any sort of inherently liberatory ethos in collectivity. Though she takes interest in slime mold's plasmodial improprieties that confound hierarchical taxonomies, her characterization of the Oankali as "powerfully acquisitive" demonstrates the colonialist potentiality of collectivity, too. Perhaps Butler was also thinking of the 1958 film *The Blob*, which is to say communism,[6] though of course it's capitalism, too. We have witnessed how readily the World Bank has adapted the idea of the commons to suit global markets that actually serve private interests (Federici 2012).

In the Xenogenesis series, Butler's interest in the plasmodial improprieties of slime mold bump up against the matter of slavery—the rendering of human flesh as property. Reading Butler's *Dawn* as subaltern literature, Eva Cherniavsky invokes Hortense Spillers's theorization of the "theft of the body itself" to articulate the process by which "a body [is] rendered absolutely and impossibly improper insofar as it becomes

(another's) property" (Cherniavsky 1996, 107). Oankali reproductive practice thoroughly sees dialectical relations of master/slave, self/other, and alien/human to their enmeshed ends. The Oankali, Cherniavsky continues, "practice reproduction as a form of corporate/corporeal impropriety, in which they perpetuate 'their' identity and agency by displacing themselves across the historical and territorial limits of Oankali culture" (1996, 108). In conversations about human and nonhuman ontologies, about intra-action and sympoiesis, black studies and decolonial theory offer much-needed reminders of how the category of the human even comes to be.

With this essay I mean to interject Butler's thinking beyond the human into a recent flurry of critical interest in Sylvia Wynter's interventions into Enlightenment humanism (Hantel 2015; Jackson 2013; McKittrick 2014). The category of the human, according to Wynter, catalyzed its liberation as a rights-bearing subject on the backs of slaves and many others relegated to the nonhuman. At a moment when the slime mold presents itself as a new material to think with, Butler's archive offers up another way to think beyond the human without flattening that concept into a universal given.

Conclusion: The Alien within the Human

I met my first slime mold not too long ago when it was time to put some mulch down in the northern woodlands of Vermont. I recoiled from its gelatinous movements, creeped out by its "dog vomit" masquerade and alien presentation. It may have been of this earth but it felt as though I were encountering an extraterrestrial, and I needed to unlearn the visceral disgust that came with this interspecies contact. Several months later, I made my first trip to the Octavia Butler papers, where I came across the note that launched this essay. The surprise I felt upon encountering the slime mold in the yard and the slime mold in the archive was quite similar. I have always understood the practice of reading science fiction as an exercise in thinking beyond the self. As a woman of color brought up in fairly conventional reading environments (at least in the classroom), I was asked constantly to understand from perspectives that were alien to me though they were often assumed to be universal.

This case study of the slime mold begins to reroute "the primacy of matter" in feminist theory through decolonial thought and queer-of-color

critique (Coole and Frost 2010, 1).[7] If the turn to matter in philosophy asserts a realism beyond human ken, it engages a speculative realism that would have thinkers taking up slime mold as an object through which to imagine another ontology, beyond the human. Butler manages to do so without dissolving the human into the object—even as she wants to get to know it better. What she does is speculative fabulation, and I offer it up as a feminist queer science studies methodology.

Notes

1 I would like to thank the inspiring audience and participants at University of California San Diego's "Shaping Change: Remembering Octavia E. Butler" conference in June 2016.

2 At a moment when many in the humanities and social sciences are taking a turn to the nonhuman, I am not alone in looking to science fiction as a site of inquiry that has long been thinking beyond the human. Donna Haraway was the person who first articulated this connection in my own reading trajectory, but I also join Colin Milburn, Steven Shaviro, Rebekah Sheldon, McKenzie Wark, and several others in bringing together science fiction studies and conversations in the recent critical moves beyond the human.

3 Thanks to Sami Schalk, who brought this point to my attention during a June 4 Q&A session at the UCSD "Shaping Change" conference.

4 See also Tero et al. (2010), whose research on *Physarum polycephalum* led to the project featured in Sanders's *Wired* magazine article.

5 Indeed, the Oankali attribute the destruction of the human species to "two incompatible characteristics": Humans are intelligent, but we are also deeply hierarchical (Butler [1987] 1997, 37).

6 For a stunning account of the 1957 presidential prayer breakfast at which *The Blob* was conceived, see Jeff Sharlet's *The Family* (2008, 181).

7 Coole and Frost ask: "How could we ignore the power of matter and the ways it materializes in our ordinary experiences or fail to acknowledge the primacy of matter in our theories?"

Works Cited

Adamatzky, Andrew, and Genaro J. Martinez. 2013. "Bio-imitation of Mexican Migration Routes to the USA with Slime Mould on 3D Terrains." *Journal of Bionic Engineering* 10 (2): 242–250.

Ahmed, Sara. 2006. *Queer Phenomenology: Orientations, Objects, Others*. Durham: Duke University Press.

Bahng, Aimee. 2017. *Migrant Futures: Decolonizing Speculation in Financial Times*. Durham: Duke University Press.

Barad, Karen. 2007. *Meeting the Universe Halfway: Quantum Physics and the Entanglement of Matter and Meaning*. Durham: Duke University Press.
Bryant, Levi R., Nick Srnicek, and Graham Harman. 2011. "Towards a Speculative Philosophy." In *The Speculative Turn: Continental Materialism and Realism*, edited by Levi R. Bryant, Nick Srnicek, and Graham Harman, 1–18. Victoria: re.press.
Butler, Octavia E. 1988. "Notes on Organisms." December 31. Box 83, Folder 1625. Octavia E. Butler Papers. Huntington Library, San Marino, CA.
———. [1987] 1997. *Dawn*. New York: Warner Books.
———. 1993. *Parable of the Sower*. New York: Warner Books.
———. 2000. *Lilith's Brood*. New York: Aspect/Warner Books.
Cherniavsky, Eva. 1996. "Subaltern Studies in a US Frame." *boundary 2* 23 (2): 85–110.
Coole, Diana, and Samantha Frost. 2010. *New Materialisms: Ontology, Agency, and Politics*. Durham: Duke University Press.
Cooper, Melinda. 2011. *Life as Surplus: Biotechnology and Capitalism in the Neoliberal Era*. Seattle: University of Washington Press.
Federici, Silvia. 2012. "Feminism and the Politics of the Commons." In *The Wealth of the Commons: A World Beyond Market and State*, edited by David Bollier and Silke Helfrich. Amherst: Levellers Press.
Ferreira, Maria Aline. 2010. "Symbiotic Bodies and Evolutionary Tropes in the Work of Octavia Butler." *Science Fiction Studies* 37 (3): 401–415.
Gorby, Yuri. 2009. "Op-Ed: Microbes May Be More Networked than You Are." *Wired,* June 16. Accessed June 28, 2016. www.wired.com/2009/06/ftf-gorby/.
Hantel, Adam Maxlind. 2015. "Intergenerational Geographies of Race and Gender: Tracing the Confluence of Afro-Caribbean and Feminist Thought Beyond the Word of Man." PhD thesis, Rutgers. doi:10.7282/T3057HXS.
Haraway, Donna. 1991. *Simians, Cyborgs, and Women: The Reinvention of Nature*. New York: Routledge.
———. 2016. *Staying with the Trouble: Making Kin in the Chthulucene*. Durham: Duke University Press.
Hotz, Robert Lee. 2014. "Off the Wall: Scientists Get Prepped for Slime Mold Racing." *Wall Street Journal,* March 12. Accessed July 22, 2016.
Jackson, Zakiyyah Iman. 2013. "Animal: New Directions in the Theorization of Race and Posthumanism." *Feminist Studies* 39 (3): 669–685.
Keim, Brandon. 2008. "Complexity Theory in Icky Action: Meet the Slime Mold." *Wired,* February 15. Accessed June 28, 2016. www.wired.com/2008/02/complexity-th-1/.
Keller, Evelyn Fox. 1983. "The Force of the Pacemaker Concept in Theories of Aggregation in Cellular Slime Mold." *Perspectives in Biology and Medicine* 26 (4): 515–521.
McKittrick, Katherine. 2014. *Sylvia Wynter: On Being Human as Praxis*. Durham: Duke University Press.

Meillassoux, Quentin. 2008. *After Finitude: An Essay on the Necessity of Contingency*. New York: Continuum.
Milburn, Colin. 2010. "Modifiable Futures: Science Fiction at the Bench." *Isis* 101 (3): 560–569.
Puar, Jasbir. 2007. *Terrorist Assemblages: Homonationalism in Queer Times*. Durham: Duke University Press.
Sanders, Laura. 2010. "Slime Mold Grows Network Just Like Tokyo Rail System." *Wired*, January 22. Accessed June 28, 2016. www.wired.com/2010/01/slime-mold-grows-network-just-like-tokyo-rail-system/.
Sharlet, Jeff. 2008. *The Family: Power, Politics and Fundamentalism's Shadow Elite*. New York: HarperCollins.
Shaviro, Steven. 2016. *Discognition*. London: Repeater.
Subramaniam, Banu. 2014. *Ghost Stories for Darwin: The Science of Variation and the Politics of Diversity*. Urbana-Champaign: University of Illinois Press.
Tero, Atsushi, Seiji Takagi, Tetsu Saigusa, Kentaro Ito, Dan P. Bebber, Mark D. Fricker, Kenji Yumiki, Ryo Kobayashi, and Toshiyuki Nakagaki. 2010. "Rules for Biologically Inspired Adaptive Network Design." *Science* 327 (5964): 439–442.
Vint, Sherryl. 2010. "Animal Studies in the Era of Biopower." *Science Fiction Studies* 37 (3): 444–455.