

Dinesh Wadiwel

Chicken Harvesting Machine:  
Animal Labor, Resistance,  
and the Time of Production

Chicken catching in the context of industrialized animal agriculture is usually dangerous for both animals and humans.<sup>1</sup> Routinely, chicken catching is performed by human hands; many chickens will sustain injuries in the process (see Langkabel et al. 2015), and many will be “dead on arrival” when they finally reach the slaughterhouse (see Nijdam et al. 2004). Human workers, too, will sustain injuries as a result of the repetitive work of engaging with struggling chickens (see Quandt et al. 2012; HRW 2004; Stuesse 2016: 120–46). Partly due to the intensity of human labor involved in chicken catching, there has been a steady introduction of automated chicken “harvesting” machines into production processes. Capitalism, after all, always searches for new ways to extract surplus and, at least in the terms laid out by Karl Marx (1986: 432) in *Capital*, volume 1, has led to developments in technologies that seek to increase “relative” surplus value by reducing human labor time.<sup>2</sup> But beyond simply making chicken catching labor performed by humans more productive, the automation of the chicken harvesting machine also holds the promise of almost completely displacing the need for human labor itself. As such, chickens increasingly no longer confront humans

*The South Atlantic Quarterly* 117:3, July 2018

DOI 10.1215/00382876-6942135 © 2018 Duke University Press

in production processes, but instead almost always encounter machines. The “harvesting” machine takes different forms: some look like wide-mouthed vacuum cleaners, larger than a motor vehicle; while another variation uses “foam paddles to place birds on inclined conveyor belts that carry the birds into crates” (Schilling et al. 2008: 163–64). This device is usually rolled over a darkened compound containing thousands of chickens, who desperately climb over each other to escape. The speed of capture is dizzying. As the chickens succumb to the machine, they are sucked into its internality, whisked away almost seamlessly, and thrust into crates.

Jack Halberstam has proposed “wildness” as a kind of anarchy or chaos in the midst of solidified structure and production (material, normative, symbolic), one that betrays a political potentiality: for Halberstam (2013: 127), the new conceptualization here (i.e., the use of the term *wild*) is important in moving “toward languages of unpredictability, breakdown, disorder, and shifting forms of signification.”<sup>3</sup> In this view, it is because the objects of norms, disciplines, controls, and violence always resist complete capture that implicit with stabilized systems is a play or instability that undermines assumed forms of domestication or docility. Importantly, the idea of “wildness” attempts to track the continuing failure of attempts to subvert, which nonetheless point to a pervasive and pressing vitality in resistant energies, something Halberstam (2014: 147) links with the utopian queer politics of José Esteban Muñoz (2009).

The frame of wildness is potentially useful in highlighting the instability in how we understand “domesticated” animals in a variety of production processes. Although industry nomenclature—such as the word *harvest*—would suggest the relative docility and compliance of animals being caught, the use of chicken catching machines only demonstrates the implicit resistance of chickens to human subordination: that is, the reality that chickens are “wild” in the face of machines that seek to make them docile. There is thus a curious instability in how we understand the concept of the “domesticated animal” who, it is assumed through generations of training, habituation, body modification, reproductive controls, and enclosure, occupies some sort of position of docility or beneficent relationality with respect to humans and thus, through a kind of failure of resistance, is imagined as “not wild” or “not belonging in the wild.” However, even domesticated animals are always already “wild,” since the continuing technologies used to ensure compliance, and extract labor, betray the reality that animals press against, disrupt, and leak value from even the most apparently complete and relentless models of authoritarian subordination that we can devise.

An important consideration for me here is the kind of “work” animals do in these processes and how machines are deployed to both respond to resistance and simultaneously “save” human, and importantly, *nonhuman* labor. As I discuss below, the idea that animals labor in productive processes is contentious. However, if we can imagine animal labor as having a use value to capitalism, then this allows us to understand the mechanization of productive processes in a different way. In a sense, the chicken harvesting machine seeks to save on one kind of labor (i.e., human labor involved in countering animal resistance) to maximize the effectiveness of another labor time: that is, the labor time required from animals to produce themselves as commodities within the production process. The chicken harvesting machine thus reallocates labor time between species. It aims to save on the human labor costs to productive processes involved in trying to contain outbreaks, disequilibriums, and leakages. It also seeks to maximize animal labor time by disciplining the untamed rhythms of chickens who would prefer not to be caught. Production aims at subordinating the rhythms of animal labor time, and this means finding the most efficient ways to counter resistance in order to maximize value extracted.

In this essay, I explore the relationship between animal labor under capitalism, its relationship to resistance, and the potential offered by contemplation of resistance to capitalist time. First, I examine animal labor, focusing particularly on animals used for food, and attempt to untangle the complexity of their structural place within systems of value under capitalism. Second, I discuss the specific antagonism that shapes the work of food animals, one that is less about “contact zones” — in the way described by Donna Haraway (2008: 206–46) — and more about “conflict zones,” where animals confront humans, and increasingly machines, in relations of hostility. My aim here is to show the way that resistance is tied to the structural position of food animals as laboring subjects. As I discuss, the refinement of technologies of domination, and their response to the “wild” resistances of animals, aims at bringing animal labor time in sync with the rhythms of productive processes. This perspective highlights the politics of time involved with animal subordination to capital, but perhaps also connects with a utopian imagining of life for animals outside of this time.

### What Use Are Animals to Capitalism?

It is well known that Marx (1978: 70–81) was largely antagonistic toward the idea that animals labored in a meaningful way (see Johnson 2017: 278–83).<sup>4</sup>

It is true that a growing scholarship has gone some way toward addressing Marx's anthropocentric response to the problem of animal labor: for example, putting forward views that animals labor in ways that resemble the creative labor of humans (see, e.g., Benton 1993), or that animals are "alienated" in specific ways when they labor under capitalism (see, e.g., Noske 1997: 12–21; Painter 2016; Stuart, Schewe, and Gunderson 2013), or that animals might be said to be "part of the working class" (see, e.g., Hribal 2003; see also Perlo 2002: 306–7), or that animals are owed rights as laborers (see Coulter 2016; see also Cochrane 2016). While all this scholarship has laid useful foundations for thinking about the place of animals under capitalism, it shares a tendency to associate by comparison, or analogy, the structural condition of animals in production processes with those of humans, rather than seek to understand what is distinctive about animal labor. This inevitably leads to difficulties in analysis, particularly when we move the analytic frame to animals used for food, since the labor of food animals looks very different from the labor of draft animals (see, e.g., Coulter 2016: 90). For food animals, the object of production is their own body; this appears to differ dramatically from much human waged labor, as well as forms of draft animal labor, such as a donkey working a mine.

The problematic of animal labor also highlights a related difficulty with respect to the limits of comparisons to human labor: namely, the unclear relationship of animal labor to (human) forms of forced or coerced work (see, e.g., Torres 2007: 38, 60; Painter 2016: 8; Collard and Dempsey 2017: 86). For example, the comparisons of the conditions of animal labor to racial slavery made within some pro-animal scholarship (e.g., see Spiegel 1996; see also Francione 2007: 110–11) fails to disentangle abstract concepts of coerced labor from the specific dynamics of racial slavery; the latter aimed at the production of a racialized subject or, in the rendering by Frank B. Wilderson III (2010: 22–23), generated an "ontological" political status and continues to inform present-day antiblack violence and racism (see also Sexton 2010, 2011). Indeed, the tendency to imagine animal labor as equivalent to human slavery produces an analysis that potentially obscures crucial characteristics and histories of violence experienced by human subjects; as Zakiyyah Iman Jackson (2016: 108) has urged, we must consider "New World slavery as an ever-present mode of violent ontologizing that includes but exceeds the animalization of the slave, as blackness was always subject to something more" (see also Kim 2016: 46–47).

Perhaps part of the problem here is that we are asking the wrong question when we ask, do animals labor? Instead, a different question is,

what is the specific use value of animals to capital?<sup>5</sup> Or, do animals in productive processes produce value in a way that is different from that accounted for by Marx? For example, Haraway (2008: 46) has argued for the modification of Marx's value theory, inserting a concept of "encounter value" alongside the concepts of "use value" and "exchange value." Here Haraway elucidates the idea of "encounter value" to deal with the effect of cross-species interaction with "a motley array of lively beings, in which commerce and consciousness, evolution and bioengineering, and ethics and utilities are all in play" (46). There have been attempts to extend Haraway's concepts in ways that inform an augmentation of Marx's value theory so that it might concretely account for animals. Maan Barua (2017: 284), for example, has provided a significant extension of Haraway's concept of "encounter value," suggesting that it "is a process of value-generation where lively potentials and nonhuman labours of an organism constitute and make a difference to those very historical and material relations that render or transact it as a commodity." In this understanding of encounter value, Barua (2016: 728) illustrates that generation of use values in production requires a grappling between human and nonhuman (including a nonhuman labor) that helps to produce the animal as a commodity. Here encounters between human and nonhuman natures simultaneously make the value process fraught or potentially valuable. These uncertain (or "wild") encounters disturb the process of extracting value: production will have to deal with a being who is slippery, who develops coshaping relations with others in the production process, and who actively resists complete subordination by production. We might read this sort of engagement or encounter, in a relatively benign way, as mutually productive. However, as I argue below, such "encounters" are sites of antagonism or conflict; they represent a messy grappling with potentially noncompliant natures that will have to be "tamed" or subordinated, including through coercive means, into the rhythms of production in order to generate value. As such, animal labor is tied to the process of resistance to that labor.

A different refraction of Haraway's approach is provided by Rosemary-Claire Collard and Jessica Dempsey (2013: 2684), who focus on a notion of "lively commodities," which they argue "produce capitalist value as long as they remain alive and/or promise future life." Here a biopolitical process of making life / keeping alive is central to value production (Collard 2014: 152).<sup>6</sup> Collard and Dempsey's approach strongly resonates with the perspective of Melinda Cooper (2008: 148), who explores the processes of the biological body as sources for "a self-regenerative surplus value, a biological promise

whose future self-valorizations cannot be predetermined or calculated in advance” (see also Cooper and Waldby 2014: 230–3110). This idea of self-generative or metabolic processes as value bends how we might understand labor, offering useful ways to think about the labor of animals used for food, whose bodily processes are transformed into value.<sup>7</sup> Indeed, Les Beldo (2017), examining chicken production, offers a similar view of life as a vital self-generating force that produces value through “metabolic labor.” For Beldo, “labor” offers an opportunity for an affirmative and active rendering of animals within production that is a counterpoint to the accounts that offer a “negative” perspective of systems of domination over animals. Against these negative readings, Beldo suggests that the ever-present vitality of animal life, that which produces value, confirms an affirmative force that animals possess that is relied on by systems of production (110). I note that this means that Beldo’s analysis deliberately distances itself from a theory of resistance (110), even though, as Beldo acknowledges, the sort of labor performed by animals in production systems makes the category of “labor” (at least in the sense of labor as a consensual process) fraught (124–25). As I argue below, there is no reason to imagine that animal labor and resistance are not interconnected: indeed, animal resistance to systems is intrinsic to the character of this labor, and the adaption of human and machinic labor processes to this resistance is precisely what produces value.

### Conflict Zones

In a remarkable 2003 essay, economic historian Jason Hribal observed the centrality of animal resistance to the history of the development of productive processes in animal agriculture, where efficiency gains have been driven by attempts to overcome animal resistance to utilization.

Hedges and fences were erected to hinder escapes. Wooden triangular-shaped yokes would be fitted around necks to hinder movement. Wooden clogs would be fastened around back legs to hinder jumping or running. Some farmers would actually cut the leg tendons of their workers. Others clipped the wings of chickens, turkeys, and geese to prevent flight, and still others would blind animals by using a “red hot knitting needle.” If these measures failed, there were additional implementations. Local pounds were built for the captured. Ear-marks and brands were increasingly used as a means of identification, and nose-ringing prevented the maroons, especially pigs, from digging into the local fields. (Hribal 2003: 449; see also Hribal 2007, 2010, 2012)

Hribal's unique innovation was to notice the way that technical developments in human labor practices and implementations in control and enclosure responded to animal resistance. I have since developed this approach further in my own work, arguing for an "autonomous" or *operaist* model of resistance (see Wadiwel 2015: 10–16; 2016).<sup>8</sup> Here capitalism is rendered as essentially a parasitic formation that compels labor and sucks value. Resistance to this relationship of subordination is intrinsic to systems; however, the tendency of productive systems will be to deploy techniques and rationalities in order to continually counter resistance to work and establish new forms of value capture. For example, as Michael Hardt and Antonio Negri (2000: 272–76) have explained, the forms of work flexibilities that are associated with post-Fordist production (flexible work hours, work from home arrangements, teleworking, etc.) are a product of capitalism countering and adapting to the resistance of workers to Fordist modes of production and work itself, resistance that included strategies of absenteeism, slow work, and sabotage. This autonomous- or operaist-inspired analysis of resistance relies on tracking the dynamics of the "real subsumption" of labor within productive systems: the character of labor is fundamentally shaped by the rhythms of production, and insubordination to these rhythms is constantly countered with innovation in order to outflank this resistance.

In my view, this conceptualization of resistance can be applied to a range of animal production systems to track the way that animal insubordination drives the development of new techniques and technologies to counter that resistance. For example, I have argued that the development of aquaculture — or fish farms — has been in part a technological and organizational solution to the problem of fish resistance (see Wadiwel 2016: 217–18). Globally, wild fish capture has proved an environmental disaster, with strong suggestions that the oceans are "running out of fish" (see Vince 2012).<sup>9</sup> However, fish are hard to catch not simply because humans have destroyed their populations; on the contrary, fish are hard to catch because they evade capture, hence the need for a range of technological solutions in wild fish capture (e.g., hooks and nets) and aggressive industrialized techniques (trawling, use of sonar detection, etc.) to overcome creatures who would prefer not to be caught. Aquaculture provided a unique solution to these interconnected problems (fish population destruction, human labor costs, and fish resistance): the short history of the emergence of large-scale aquaculture today — where fish farms now account for 40 percent of the world's fish supply — is essentially a story of domestication (enclosure and controls over

movement, nutrition, and reproduction) to overcome resistance, by applying extensive technical and organizational controls to fish populations.

But even in the total environment of aquaculture, the problem of fish resistance does not go away; on the contrary, resistance and the process of countering it is central to continuing production efficiencies, since the drive for increasing productivity (in this case, animal labor productivity) will impel systems to continue to counter the slippages of production and exert stronger controls over animals, including, for example, by improving sea cages to prevent escape (see Naylor et al. 2005; Jensen et al. 2010) or techniques to influence fish movements within sea cages to reduce abrasion and therefore maintain value in the end product (see Wadiwel 2016: 218–20). Even domesticated animals here remain “wild” in this sense: the imperative for the productive system will be to compel compliance with the rhythms of production at the most minute level to extract maximum surplus from this labor. When animals confront the production processes we expose them to, they arrive as resistive agents. As we seek to bend them to the rhythms of production, our grappling with them produces a need to labor.

Insofar as the lives of animals are almost completely subordinated by these processes, this resistance is equivalent to a will to live in the face of an aversive environment where all time is labor time, and the final product of labor is the animal’s own body itself. To make sense of this, I would like to return to Marx to consider the structural position of this unique form of labor. In a section of *Capital*, volume I, Marx (1986: 314–15) provides an account of the microdynamics of labor’s role in creating value:

While productive labour is changing the means of production into constituent elements of a new product, their value undergoes a metempsychosis [*Seelenwanderung*]. It deserts the consumed body, to occupy the newly created one. But this transmigration [*Seelenwanderung*] takes place, as it were, behind the back of the actual labour in progress. The worker is unable to add new labour, to create new value, without at the same time preserving old values, because the labour he adds must be of a specific useful kind, and he cannot do work of a useful kind without employing products as the means of production of a new product, and thereby transferring their value to the new product. The property therefore which labour-power in action, living labour, possesses of preserving value, at the same time as it adds it, is a gift of nature which costs the worker nothing, but is very advantageous to the capitalist since it preserves the existing value of his capital.

For human labor, this means that labor works on an object of production that is distinct from one's own body, and this process "consumes" a use value and, simultaneously through labor, produces a new use value that contains the old use value within it: "What is produced is a new use-value in which the old exchange-value re-appears" (316). In this view, the worker, for example, sands a table but must in the process of sanding the table maintain the old value in the table (i.e., not destroy the table) while simultaneously adding value through the sanding work. Here the money owner "trusts" the worker with the object of production; the worker faithfully does not damage the value of the object of production while at the same time transforming it into something with a new use value that does not resemble the old. The "soul" of the object of production moves, as it were, seamlessly to a new object with a new use value, even if this "object" itself (i.e., the table) appears as one and the same.

As I have discussed above, this narrative that Marx offers is highly "disembodied": it fails to account for labor where the object of production is the body of the laborers themselves. This means that it is not immediately useful for thinking about the labor of food animals, since for food animals it is their own bodies that are created as the product of processes through production. However, we might apply some flexibility to the rigid categories that Marx imposes on the labor value process. For Marx (1986: 317), capital enters the production process either as constant capital, that is, "raw material, the auxiliary material and the instruments of labour," or as variable capital, that is, labor power that "both reproduces the equivalent of its own value and produces an excess, a surplus value." Against Marx's presumption of an absolute separation between the value forms of constant and variable capital, we can suggest that food animals enter the production process as a hybrid of both constant and variable capital. Food animals are deployed as both a raw material that will be "finished" as a product by the production process and simultaneously labor that must work on itself through a "metabolic" self-generative production. The primary alienation from the means of production that Marx describes as part of the process of value transmigration for the human wage laborer (behind the worker's back) is actually located in close proximity to the laboring animal: in this case, animals work on their own bodies, consuming old use values and producing new use values seamlessly in their bodies' own materiality. For the economics of food production, it is vital that these animals reproduce their own value in themselves (as a raw material) and simultaneously labor, without injuring the original raw material, so as

to ensure their transformation into a new use value. This is the specific use value of food animals for capitalism: they exist as a raw material that seamlessly produces a new use value in their own bodies, which are destined to become products of the production process.<sup>10</sup> 

Resistance fundamentally shapes the above positionality of food animals in production in at least two ways. First, as Collard and Dempsey (2013: 2684) have suggested, the role of animals as “lively commodities” is one where being alive is central to the production process. However, we can expand on this to note the overt sense in which life and death mark the production process in a fundamental way. Within the value chains of animal food production, death is configured as a value-producing moment (see Dutkiewicz 2013: 303): it is when death arrives that the living commodity ceases existence as a raw material and attains a use value. This means that, in essence, the production process is equivalent to life: for food animals, the whole of life is subsumed within production, so that all labor time is equivalent to the fact of living and will only reach its completion at slaughter. For food animals, labor time is not regulated by the normative limits imposed by the “working day” (see Marx 1986: 340–44). Instead, labor time equals life.  Chicken labor time equals the time the chicken is alive: this is exactly how much labor time is required from the chicken to produce “the chicken” as a product. This shapes the nature of attempts to wrest more value from this labor. The tendency of productive processes toward increasing “relative surplus value” is to reduce labor time for the production of the same use value. On the one hand, for humans, this means that average labor time to produce consumption items such as food, televisions, and automobiles has progressively been reduced through the introduction of machines, technologies, and techniques. On the other hand, for food animals, since labor time equals life, increasing relative surplus value has been accompanied by the shortening of life: for example, over the past fifty years broiler chickens have been genetically selected to effectively halve “growing” time (see Petracci et al. 2015: 364; Tallentire, Leinonen, and Kyriazakis 2016: 65–66; see also Moore 2015: 232). That has led to the perverse situation where animals are bred to grow faster in order to die quicker, reducing the production phase: therefore, literally, through the shortening of life it is possible to shorten animal labor time.

I want to stress here that the violence experienced by animals in this production process is shaped by this mix of imperatives to both make life endure in such a way as to maximally congeal value and *simultaneously shorten life* in order to reduce animal labor time (and the production cycle itself). Human control in animal agriculture aims at both of these things.

On the one hand, production innovation relies on the use of the beneficent techniques of welfare and regulation to make life endure toward the production of a final product. Thus the production and reproduction of animals within animal agriculture conforms to a biopolitical form of violence, insofar as it involves the scrupulous and infinite management of life, with deep controls over nutrition, movement, and reproduction (see Wadiwel 2015: 65–86; Wolfe 2012). On the other hand, production processes deploy practices and technological innovations designed to hasten life to its death: whether through the use of devices and techniques to expedite the transfer of living assets between phases of production (using cattle prods and other means of coercion) or whether through the use of genetic selection or hormones to progressively increase growth rates and therefore reduce the animal labor time between birth and death. There is here the economic reality of disposability that accompanies this production, which means that unplanned early death is part and parcel of the life cycle, whether in the form of attrition rates within the production system (see Tabler, Berry, and Mendenhall 2004; see also Stokholm et al. 2010) or mortality in transport (Jacobs et al. 2017; see also Weeks 2007). Insofar as these techniques of violence tend toward making living things die, they conform to Achille Mbembe's (2003: 12) understanding of *necropolitics*, as the "subjugation of life to the power of death" (see also Stanescu 2013; Wadiwel 2015: 87–96). The food animal is caught in the terrain between these two forces of life and death, as if the dream of these production processes is to bring animals to life on mass, only to "depopulate" them in the shortest possible time. Within this intoxicating intersection of hostile force, resistance for the food animal becomes equivalent to the will to persevere despite the aversive environment around them. Insofar as these animals can at least be said to prefer to live, against production systems that aim to make them die ever more quickly, life is experienced as essentially resistant, against an apparatus that looms with the continued and actualized threat of life extinguishment in the name of value.

Second, and relevant to the intensification that has accompanied mechanized industrial animal agriculture, the character of resistive encounters with animals shifts away from engagements between humans and animals toward encounters purely between animals and the instruments of mechanized production. This is, after all, the peculiar horror associated with the intensified animal agriculture of the factory farm: that is, not only the increasing massification of production, but also the progressive displacement of human labor from the production process itself, which disrupts all nostalgic imaginings of a "pastoral" relation between humans and animals.

At their most extensive, today we are seeing dramatic progress toward fully automated systems of animal agriculture, such as the chicken harvesting machines I described at the beginning of this essay, or the implementation of robotic dairy farms (see Holloway, Bear, and Wilkinson 2014; Rodenburg 2016), or the use of automation in aquaculture, such as the development of processes to sort fish by size so they are suitable for other automated processes within the value chain (see Costa et al. 2013).

In Marx's (1986: 762–81) view, such developments would highlight a changing “technical composition of capital”—that is, the increasing mass of constant capital (machines, raw materials, fixed assets) in contrast to a reduced variable “mass of labour-power”—where, increasingly, human labor appears to be supplanted by machines and raw commodities. However, the above description I have provided of the labor power of animals complicates Marx's anthropocentric view. This is partly because we can no longer maintain Marx's strict division between constant and variable capital, since in the case of contemporary industrialized agriculture, animals arrive as both. As such, as human labor appears to vacate animal agriculture in the process of its capital intensification, animals increasingly arrive as both a mass of raw materials and a mass of laborers (in the hybrid form I described above). In other words, if we take a nonanthropocentric perspective of labor, Marx's (1986: 78) view that relative capital intensity would rise—that “a smaller quantity of labour will suffice to set in motion a larger quantity of machinery and raw material”—becomes unstable within the context of live animal-based industries. Automation in animal agriculture is as much a story about the replacement of human labor with machines as it is simultaneously the story of the expansion of the mass of animal labor, which now confronts machines in a relation of domination.

Here we once again find a story of resistance that is central to animal labor within intensive mechanized (and increasingly automated) agriculture. For Marx (1986: 558–59), the fundamental antagonisms that developed in early capitalism between human workers and machines arose as a result of the sense that machines were replacing the labor and livelihoods of workers: “Since machinery is continually seizing on new fields of production, its ‘temporary’ effect is really permanent. Hence the character of independence from and estrangement towards the worker, which the capitalist mode of production gives to the conditions of labour and the product of labour, develops into a complete and total antagonism with the advent of machinery. It is therefore when machinery arrives on the scene that the worker for the first time revolts savagely against the instruments of labour.” For Marx (1993:

704; 1986: 557), the machine was the product of past human labor: the machine absorbs labor in a “coarsely sensuous form” and immediately in its deployment supplants the labor of the worker. As such, the antagonism between the human worker and the machine is one of “competition.”

For animals, however, the antagonism takes on a completely different character. Food animal labor cannot be replaced by inorganic machines, since these animals are not only labor power, but they are also raw material and finished product. Instead, the arrival of machines is in this production process merely the replacement of the antagonistic relationality between humans and animals with a new hostility: this time between animals and machines. Where animal resistance might have been previously directed against human workers whose labor power aimed at making animals productive (i.e., making animals labor), intensified production instead shifts this relation to the technologies of control: it is the machine that now confronts the animal as a force of domination aimed at compelling labor, right up until that point where value can be realized through death. The increasing intensification of animal agriculture, including progress toward full automation, means that animal labor now increasingly faces an environment where capital everywhere dominates: patterns of reproduction are completely overcome by mechanized processes; every aspect of the environment becomes enclosed within weaponized aversive living spaces determined by economic necessity; and animals are moved between phases in the value chain, including to death, through automated processes that chase them down, shackle them, and drive them toward value realization.

Within posthumanist theory, Haraway (2008: 205–46) has deployed the concept of the “contact zone” to account for material co-shaping encounters between humans and nonhumans. Haraway (2008: 216) draws this term from Mary Louise Pratt but redeploys it to account for human-animal relations. In Pratt’s (1991: 34) view, contact zones represent “social spaces where cultures meet, clash, and grapple with each other, often in contexts of highly asymmetrical relations of power, such as colonialism, slavery, or their aftermaths as they are lived out in many parts of the world today.” Pratt’s (2008: 8) interest is in trying to describe complex interactions between agents, where exchanges (such as linguistic adaption) are co-shaped despite entrenched inequalities in power. As such the “contact zone” for Pratt (2008: 8) is something of a methodological tool in enabling an analysis of fine-grained, mutually evolving interactions in the midst of deeply structured violence: “A ‘contact’ perspective emphasizes how subjects get constituted in and by their relations to each other. It treats the relations among colonizers and colonized,

or travelers and ‘travelees,’ not in terms of separateness, but in terms of co-presence, interaction, interlocking understandings and practices, and often within radically asymmetrical relations of power.” Haraway (2008: 205) deploys this concept in potentially productive ways to examine the interaction between dogs and humans in agility training, highlighting that this training enables a “chance for joint, cross-species invention that is simultaneously work and play.”

However, whether this method of analysis—where a sole focus on overarching modalities of structural domination is suspended to enable a more fine-grained examination of co-shaping relations—is useful for understanding the “contacts” between humans and animals (or machines and animals) in the context of industrial animal agriculture remains for me an unsettling question (see Wadiwel 2015: 202–20). Part of the challenge here is that while it is true that the interactions among humans, animals, machines, and institutional environments in animal agriculture are co-evolving—as I have described above, forms of animal resistance inform the modalities of violence and control that are deployed—it seems difficult to disentangle the ethics of these encounters from the broader structural domination that characterizes our mainstay relations with animals. The “contact zone” risks forgetting this overarching reality and risks also forgetting the structural differences between humans, animals, and machines within productive processes, in particular, glossing over fundamental antagonism.

Certainly, within animal agriculture, food animals have a unique position: unique because the constellation of violence that is directed toward them, and the forms of resistance they deploy, is structurally positioned in a way that is potentially quite different from other agents. Would it be better to talk about “conflict zones” rather than “contact zones”? After all a conflict zone is also a space where agents interact and co-shape each other, but the idea of a “conflict zone” highlights the ever presence of violence in shaping relations and stresses the structural antagonism between combatants. In the conflict zone of intensified animal agriculture, violence is everywhere, and it blends with the rationalities of capitalist production to produce patterned deployments of capital and (human and nonhuman) labor power. In this conflict zone, humans labor to coerce animals to work to produce themselves as commodities. As production intensifies, technological innovation and the deployment of fixed capital displace human labor power and confront animal labor power in an antagonistic relation: the aim of these deployments is to overcome the resistance of animals, bending wills toward human prerogatives. This is indeed “contact” between material bodies that press and shape

each other, but its character is all-out conflict, antagonism, and asymmetry, **living resistance only interrupted by slaughter.**

As I have argued elsewhere, humans and animals co-shape each other, but within a context of overarching domination, where deep hostility and violence shapes almost all relations (see Wadiwel 2015). Indeed, as I have also argued, this context of hostility does not necessarily stop at the borders on animal agriculture, but includes relations we might imagine as relatively benign, such as human relations with companion animals. While companion animals are not routinely exposed to the life-and-death scenario of food production, the overt domination directed toward companion animals in urban societies is suggestive of different conflict zones: these sites of friction include routine controls over reproduction and sexuality; the use of forced bodily modification (such as microchipping), discipline, and training; total controls over diet, movement, living spaces, and sociality; and quite arbitrary regimes of disposability that accompany the politics of pet industries. In these contexts, again the idea of the “domesticated” animal remains unstable: instead, “wild” resistant beings continually prompt innovation in new techniques of compliance. Conflict and antagonism mark these encounters, even if we would prefer to imagine otherwise.

### Conclusion: Resistant Time

In *Marx beyond Marx*, Negri (1991) offers an analysis of capitalism as a particular mode of political domination, one that aims at compelling work. Negri notes in particular that the development of capitalism eventually meant the subsumption of all of social life into the rhythms of production:

Society appears to us as capital's society. It is through this passage that all social conditions are subsumed by capital, that is, they become part of its “organic composition.” And besides the social conditions—which present themselves in their immediacy—capital progressively subsumes all the elements and materials of the process of circulation (money and exchange in the first place, as functions of mediation) and, thereafter, all those pertaining to the process of production, so that herein lies the foundation for the passage from manufacture to big industry to social factory. (114)

Here liberation from the rhythms of capital, that is, revolting against capital's time, becomes part of Negri's political argument for a new society. Negri exclaims: “What does it mean to struggle against capital when capital has subjugated all of lived time, not only that of the working day, but all of it.

Reproduction is like production, life is like work. At this level, to break with capital is to make a prison break” (xvi; see also Cooper 2011).

How might we interpret capital’s time? Is the domination of capital’s time the only formation that seeks to regulate life and its normative rhythm? And is capital’s time experienced differently by different collectivities? Certainly, as Halberstam (2005: 10) notes, time as a “natural” duration is also constructed by intersecting relations of gender, race, and sexuality: “Reproductive time and family time are, above all, heteronormative time/space constructs. . . . All kinds of people, especially in postmodernity, will and do opt to live outside of reproductive and familial time as well as on the edges of logics of labor and production.” In a sense here, telling the story of capital’s time is also telling the story of nonconformance with this time and understanding different forms of temporal asymmetries that shape collective resistances. As Muñoz argues, displacement from a hegemonic conception of time is what perhaps marks the subjective experience of those who are outcast by a range of different modalities of domination. Responding to the work of Tavia Nyong’o, Muñoz (2009: 182–83) reflects: “There is something black about waiting. And there is something queer, Latino, and transgender about waiting. Furthermore, there is something disabled, Indigenous, Asian, poor, and so forth about waiting. . . . The essential point here is that our temporalities are different and outside. They are practiced failure and virtuosic.”<sup>11</sup>

I am curious here how the animals we press into production are shaped by its rhythms but simultaneously placed outside of time. How do animals experience capital’s time? One important thing to note—and this responds to Negri—is that the anthropocentrism of many accounts of capital’s time misses that, long before the arrival of post-Taylorist regimes of production, animals experienced a world where capital had “subjugated all of lived time, not only that of the working day, but all, all of it. Reproduction is like production, life is like work.” Long before the “post-Taylorist” period, animals experienced the immersion of their whole lives into the productive rhythms of capitalism, in such a way that every moment of life became a value-producing moment for capital; indeed, as in the case of industrially produced chickens, the life of the chicken is equivalent to the production cycle itself. And this is a life of waiting: waiting for the next meal to be delivered, waiting for the next phase of production, waiting for the day when the harvesting machine arrives, waiting for the automated cutting blade that will shorten life.

But as I have described in this essay, the time of animals is also a time that resists the rhythms imposed by the productive processes around. This

collective resistance has produced the means used to quell nonconsent: large-scale chicken resistance has produced the nightmare reality of the chicken harvesting machine. While a lot of work in animal rights theory has attempted to elucidate the “intrinsic value” of animals in order to recognize moral worth, might a focus on labor (and resistance) give advocates different tools?<sup>12</sup> In particular, what would it mean to give animals time, that is, recognize their resistance to capital’s time? Would this politics seek to disrupt the rhythms of production and the incessant drive toward value extraction? And does this project resonate with different “utopian” political projects that similarly aim to intervene in the politics of time?

### Notes

The ideas in this essay have received a lot of generous feedback and discussion by a range of scholars. I would like to particularly acknowledge Eliza Littleton, Nekeisha Alayna Alexis, and the Past and Present Reading Group in the Department of Political Economy, University of Sydney.

- 1 Humans killed approximately 62 billion chickens in 2014 for meat (FAO 2017). Such large-scale slaughter requires mechanized forms of production. However, even in capital-intensive forms of killing, the business of making chickens available for slaughter typically involves the mass deployment of human labor at crucial points in the value chain. For example, chicken catching prior to transport or slaughter is usually performed by human hands. This process is intensely frictional and involves a tussle between human workers and the chickens who would prefer not to be caught. As a result, the resistance of chickens necessitates the deployment of tactics and subterfuge to counter it: hence the need for human workers to work in collectives and use dimmed lighting. A 2017 exposé in *The New Yorker* documents this intersection between low-paid human labor and chickens in this production stage: “At night, when the chickens are sleeping, crews of chicken catchers round them up, grabbing four in each hand and caging them as the birds peck and scratch and defecate. Workers told me that they are paid around \$2.25 for every thousand chickens. Two crews of nine catchers can bring in about seventy-five thousand chickens a night” (Grabell 2017).
- 2 I shall return in this essay to the difference between Marx’s concept of “absolute” and “relative” surplus value; however, Marx’s (1986: 432) definition in *Capital*, volume 1, is instructive: “I call surplus-value which is produced by the lengthening of the working day, *absolute surplus-value*. In contrast to this, I call that surplus-value which arises from the curtailment of the necessary labour time, and from the corresponding alteration in the respective lengths of the two components of the working day, *relative surplus-value*.” Note here, and relevant to my discussion, that necessary labor time in Marx’s formulation refers explicitly to human labor time.
- 3 In relation to chickens in production and resistance, see Halberstam’s (2011: 29) analysis of the film *Chicken Run* as a “Marxist allegory . . . of resistance, revolt, and utopia pitted against new waves of industrialization and featuring claymation birds in the role of the revolutionary subject.”

- 4 Certainly, the assumption that animals *do not* labor is a materially enacted reality within economic systems globally: animals are simply treated as circulating capital or raw assets on the balance sheets of international agribusiness. But it is curious that the idea that animals do not labor continues to shape even contemporary critical perspectives on capitalism, where animals are either ignored as laboring subjects or dismissed in some way. For example, while Jason W. Moore's (2015: 65) recent and influential *Capitalism in the Web of Life* offers a highly useful reading of Marx's value theory without Marx's anthropocentrism, it is notable that Moore explicitly rejects the idea that animals labor in a "valuable" way (93n9).
- 5 Louis Althusser reminds us that the key to Marx's approach as a philosopher was not simply to ask the same question and provide a different answer but to re-pose the question in a way that unveils what was unaccounted for or assumed in the original question: "That is why Marx can pose the unuttered *question*, simply by uttering the concept present in the unuttered form in the emptiness in the *answer*, sufficiently present in this answer to produce and reveal these emptinesses as the emptinesses of a presence" (Althusser et al. 2015: 21). Thus Althusser points out that Marx offers innovation not simply in asking, "What is the value of labour?" but instead in asking, "What is the value of labour power?" (Althusser et al. 2015: 22). The latter question allows Marx to treat labor power as distinct from the laborer, as something that is structurally and historically positioned, as something that is sought after and commanded by capital: in other words, by drawing attention to how wage labor under capitalism differed in character, Marx's formulation of the question ("What is labour power?") allowed for a critical problematic that had evaded classical economics. In a similar sense, it is for me less useful to ask, do animals labor? than it is to ask, what is the value of animal labor power? Or perhaps a different question is, what is the use value of animals to capital? This question is potentially differentiated from the question of what makes animals attractive as final salable products (e.g., are animals good to eat?), which deals only with the fetishization of commodities in the consumption circulation of capital and not the production circulation. Instead, asking, what is the use value of animals to capital? deliberately forces us to consider the value role of animals within the production side of capitalism, that is, the place of animals within the exchange of money for capital (and capital for money), which relies on a productive process where labor is deployed in concert with fixed and circulating capital in order to produce value.
- 6 The need to stay alive is also a biopolitical reality for human labor power used in production processes. However, this requirement characteristic for animal labor seems to be highly relevant to understanding what is distinctive about the food animal, where the "mere" or "bare" fact of living, in the biopolitical sense described by Giorgio Agamben (1998; see also Wadiwel 2015: 70–80)—that is, being housed, constrained, and fed in an intensive environment during the predetermined production cycle—is what is required for the generation of value.
- 7 I note here a resonance between this conceptualization of the self-generative work of the body and feminist theorization of labor practices such as commercial surrogacy (see Pande 2014: 89–91; see also Anderson 1990). This theorization is also broadly resonant with Marxist and heterodox economic conceptualizations of housework (see Federici 2014) and care labor (see Folbre 2008).

- 8 In this view I have been directly influenced by the Italian Marxist operaist tendency (see Mezzadra 2009) and the work of Fahim Amir (2013a, 2013b), who explores opera-  
 9 ism as a way to explain animal subordination in systems of production (see also Kowalczyk 2014; Read 2017).
- 9 In addition, there is increasing awareness of the disturbing realities of this globalized industry, which has increasingly sought to squeeze human labor costs, including through the use of forced labor in capture and processing industries (see Chantavanich, Laodumrongchai, and Stringer 2016).
- 10 For Marx, the product comes about by bringing together fixed capital (machines, tools) with circulating capital (raw materials) and labor time. This might be represented as  $P = FC + CC + LT$ . We can augment this to represent animals in their status as a hybrid of labor and circulating capital: for example,  $P = FC + (CC + CCA) + (LT + LTA)$ , where  $CCA$  equals animals as circulating commodities and  $LTA$  equals animal labor time. Naturally, this formula is complicated when we apply prices, since human labor time is purchased with wages, while the price of animal labor time (time of life) must be sustained through raw materials (feed, medication, water, etc.), and it is worth stressing that there are complex problems here, including how Marx's values transform to prices (see Marx 1991: 254–72; Shaikh 1977). However, note that the revised formula that includes animal labor time offers us a stark illustration of the effect of capital intensification in production: as human labor time ( $LT$ ) diminishes, animal labor time remains and potentially expands ( $LTA$ ), and simultaneously animals expand as both raw materials and consumers of other raw materials (feed, medications, etc.), tending toward  $P = FC + (CC + CCA) + LTA$ . This illustrates why the imperative will be to reduce animal labor time in the form of length of life as a variable. However, this labor time cannot be completely eliminated: animals are raw materials, so they have to be present in production and will expand in number as raw materials expand, and thus assuming labor time remains constant, labor time must expand. But life can be shortened and thus reduce the length of this production phase.
- 11 Muñoz (2009: 206n12) refers to a conference presentation Nyong'o made in 2008. However, the context of the citation, I believe, can be found in a later published essay, where Nyong'o (2010: 83) asks: "Is there anything black about waiting? It is certainly familiar enough, even in an era whose enigma is the arrival of the first US black president. The pedagogic time of the nation imposes a different imperative upon black freedom dreams than those available from radical traditions of black performativity."
- 12 I leave aside the complex question of how animals themselves materialize collective political resistance as a "movement" and, indeed, whether this can be conceptualized. On this point, see Hardt's (2015) conversation with Massimo Filippi (see also Reggio 2016).

## References

- Agamben, Giorgio. 1998. *Homo Sacer: Sovereign Power and Bare Life*. Translated by Daniel Heller-Roazen. Stanford, CA: Stanford University Press.
- Althusser, Louis. 1977. *For Marx*. Translated by Ben Brewster. London: New Left Books.
- Althusser, Louis, et al. 2015. *Reading Capital: The Complete Edition*. Translated by Ben Brewster and David Fernbach. London: Verso.

- Amir, Fahim. 2013a. "Rats with Wings." *Eurozine*, August 30. [www.eurozine.com/rats-with-wings/](http://www.eurozine.com/rats-with-wings/).
- Amir, Fahim. 2013b. "Zooperasmus: 'Über den Tod hinaus leisteten die Schweine Widerstand . . .'" ("Zooperatism: 'The Pigs' Resistance Went beyond Death . . ."). Presentation at the "Critique of Political Zoology" conference, Hamburg, June 14–15.
- Anderson, Elizabeth S. 1990. "Is Women's Labor a Commodity?" *Philosophy and Public Affairs* 19, no. 1: 71–92.
- Barua, Maan. 2016. "Lively Commodities and Encounter Value." *Environment and Planning D: Society and Space* 34, no. 4: 725–44.
- Barua, Maan. 2017. "Nonhuman Labour, Encounter Value, Spectacular Accumulation: The Geographies of a Lively Commodity." *Transactions of the Institute of British Geographers* 42, no. 2: 274–88.
- Beldo, Les. 2017. "Metabolic Labor: Broiler Chickens and the Exploitation of Vitality." *Environmental Humanities* 9, no. 1: 108–28. doi:10.1215/22011919-3829154.
- Benton, Ted. 1993. *Natural Relations: Ecology, Animal Rights, and Social Justice*. London: Verso.
- Chantavanich, Supang, Samarn Laodumrongchai, and Christina Stringer. 2016. "Under the Shadow: Forced Labour among Sea Fishers in Thailand." *Marine Policy* 68: 1–7. doi:10.1016/j.marpol.2015.12.015.
- Cochrane, Alasdair. 2016. "Labour Rights for Animals." In *The Political Turn in Animal Ethics*, edited by Robert Garner and Siobhan O'Sullivan, 15–32. London: Rowman and Littlefield International.
- Collard, Rosemary-Claire. 2014. "Putting Animals Back Together, Taking Commodities Apart." *Annals of the Association of American Geographers* 104, no. 1: 151–65.
- Collard, Rosemary-Claire, and Jessica Dempsey. 2013. "Life for Sale? The Politics of Lively Commodities." *Environment and Planning A* 45, no. 11: 2682–99.
- Collard, Rosemary-Claire, and Jessica Dempsey. 2017. "Capitalist Natures in Five Orientations." *Capitalism Nature Socialism* 28, no. 1: 78–97.
- Cooper, Melinda. 2008. *Life as Surplus: Biotechnology and Capitalism in the Neoliberal Era*. Seattle: University of Washington Press.
- Cooper, Melinda. 2011. "Marx beyond Marx, Marx before Marx." In *Reading Negri: Marxism in the Age of Empire*, edited by Pierre Lamarche, Max Rosenkrantz, and David Sherman, 127–47. Chicago: Open Court.
- Cooper, Melinda, and Catherine Waldby. 2014. *Clinical Labor: Tissue Donors and Research Subjects in the Global Bioeconomy*. Durham, NC: Duke University Press.
- Costa, Corrado, et al. 2013. "Automated Sorting for Size, Sex, and Skeletal Anomalies of Cultured Seabass Using External Shape Analysis." *Aquacultural Engineering* 52: 58–64. doi:10.1016/j.aquaeng.2012.09.001.
- Coulter, Kendra. 2016. *Animals, Work, and the Promise of Interspecies Solidarity*. New York: Palgrave Macmillan.
- Dutkiewicz, Jan. 2013. "'Postmodernism,' Politics, and Pigs." *PhaenEx* 8, no. 2: 296–307.
- FAO (Food and Agriculture Organization of the United Nations). 2017. FAOSTAT. Data update, May. [www.fao.org/faostat/en/#home](http://www.fao.org/faostat/en/#home).
- Federici, Silvia. 2014. *Caliban and the Witch: Women, the Body, and Primitive Accumulation*. Brooklyn, NY: Autonomedia.
- Folbre, Nancy. 2008. *Valuing Children: Rethinking the Economics of the Family*. Cambridge, MA: Harvard University Press.

- Francione, Gary L. 2007. *Animals, Property, and the Law*. Philadelphia: Temple University Press.
- Grabell, Michael. 2017. "Exploitation and Abuse at the Chicken Plant." *New Yorker*, May 8. [www.newyorker.com/magazine/2017/05/08/exploitation-and-abuse-at-the-chicken-plant](http://www.newyorker.com/magazine/2017/05/08/exploitation-and-abuse-at-the-chicken-plant).
- Halberstam, Jack. 2005. *In a Queer Time and Place: Transgender Bodies, Subcultural Lives*. New York: New York University Press.
- Halberstam, Jack. 2011. *The Queer Art of Failure*. Durham, NC: Duke University Press.
- Halberstam, Jack. 2013. "Go Gaga: Anarchy, Chaos, and the Wild." *Social Text* 31, no. 3: 123–34.
- Halberstam, Jack. 2014. "Wildness, Loss, Death." *Social Text* 32, no. 4: 137–48.
- Haraway, Donna. 2008. *When Species Meet*. Minneapolis: University of Minnesota Press.
- Hardt, Michael. 2015. "Not in Your Name: Interview with Michael Hardt." By Massimo Filippi. *Liberazioni—Rivista di critica antispeticista*, no. 20. [www.liberazioni.org/articoli/Lib20-Hardt-Filippi.pdf](http://www.liberazioni.org/articoli/Lib20-Hardt-Filippi.pdf).
- Hardt, Michael, and Antonio Negri. 2000. *Empire*. Cambridge, MA: Harvard University Press.
- Holloway, Lewis, Christopher Bear, and Katy Wilkinson. 2014. "Robotic Milking Technologies and Renegotiating Situated Ethical Relationships on UK Dairy Farms." *Agriculture and Human Values* 31, no. 2: 185–99. doi:10.1007/s10460-013-9473-3.
- Hribal, Jason. 2003. "'Animals Are Part of the Working Class': A Challenge to Labor History." *Labor History* 44, no. 4: 435–53.
- Hribal, Jason. 2007. "Animals, Agency and Class: Writing the History of Animals from Below." *Human Ecology Forum*. 14: 101–12.
- Hribal, Jason. 2010. *Fear of the Animal Planet: The Hidden History of Animal Resistance*. Petrolia, CA: CounterPunch; Oakland, CA: AK Press.
- Hribal, Jason. 2012. "Animals Are Part of the Working Class Reviewed." *Borderlands* 11, no. 2. [www.borderlands.net.au/vol11no2\\_2012/hribal\\_animals.htm](http://www.borderlands.net.au/vol11no2_2012/hribal_animals.htm).
- HRW (Human Rights Watch). 2004. *Blood, Sweat, and Fear: Worker's Rights in U.S. Meat and Poultry Plants*. New York: HRW.
- Jackson, Zakiyyah Iman. 2016. "Losing Manhood: Animality and Plasticity in the (Neo)Slave Narrative." *Qui Parle: Critical Humanities and Social Sciences* 25, nos. 1–2: 95–136.
- Jacobs, Leonie, et al. 2017. "Broiler Chickens Dead on Arrival: Associated Risk Factors and Welfare Indicators." *Poultry Science* 96, no. 2: 259–65. doi:10.3382/ps/pew353.
- Jensen, Østen, et al. 2010. "Escapes of Fishes from Norwegian Sea-Cage Aquaculture: Causes, Consequences, and Prevention." *Aquaculture Environment Interactions* 1, no. 1: 71–83. doi:10.3354/aei00008.
- Johnson, Elizabeth R. 2017. "At the Limits of Species Being: Sensing the Anthropocene." *South Atlantic Quarterly* 116, no. 2: 275–92. doi:10.1215/00382876-3829401.
- Kim, Claire Jean. 2016. "Murder and Mattering in Harambe's House." *Politics and Animals* 2, no. 1: 37–51. <http://journals.lub.lu.se/index.php/pa/article/view/16274/14916>.
- Kowalczyk, Agnieszka. 2014. "Mapping Non-human Resistance in the Age of Biocapital." In *The Rise of Critical Animal Studies: From Margins to Centre*, edited by Nik Taylor and Richard Twine, 183–200. London: Routledge.
- Langkabel, Nina, et al. 2015. "Influence of Two Catching Methods on the Occurrence of Lesions in Broilers." *Poultry Science* 94, no. 8: 1735–41. doi:10.3382/ps/pevi64.
- Marx, Karl. 1978. "Economic and Philosophic Manuscripts of 1844." In *The Marx-Engels Reader*, 2nd ed., edited by Robert C. Tucker, 66–125. New York: Norton.
- Marx, Karl. 1986. *Capital*. Vol. 1. London: Penguin.
- Marx, Karl. 1991. *Capital*. Vol. 3. London: Penguin.

- Marx, Karl. 1993. *Grundrisse*. London: Penguin.
- Mbembe, Achille. 2003. "Necropolitics." Translated by Libby Meintjes. *Public Culture* 15, no. 1: 11–40.
- Mezzadra, Sandro. 2009. "Italy, Operaism, and Post-Operaism." In *International Encyclopedia of Revolution and Protest*, edited by Immanuel Ness, 1841–45. Oxford, UK: Blackwell.
- Moore, Jason W. 2015. *Capitalism in the Web of Life: Ecology and the Accumulation of Capital*. London: Verso.
- Muñoz, José Esteban. 2009. *Cruising Utopia: The Then and There of Queer Futurity*. New York: New York University Press.
- Naylor, Rosamond, et al. 2005. "Fugitive Salmon: Assessing the Risks of Escaped Fish from Net-Pen Aquaculture." *BioScience* 55, no. 5: 427–37. doi:10.1641/0006-3568(2005)055[0427:fsat0]2.0.co;2.
- Negri, Antonio. 1991. *Marx beyond Marx: Lessons on the Grundrisse*. Translated by Harry Cleaver, Michael Ryan, and Maurizio Viano. Edited by Jim Fleming. Brooklyn, NY: Autonomedia.
- Nijdam, Edwin, et al. 2004. "Factors Influencing Bruises and Mortality of Broilers during Catching, Transport, and Lairage." *Poultry Science* 83, no. 9: 1610–15. doi:10.1093/ps/83.9.1610.
- Noske, Barbara. 1997. *Beyond Boundaries: Humans and Animals*. Montreal: Black Rose Books.
- Nyong'o, Tavia. 2010. "Brown Punk: Kalup Linzy's Musical Anticipations." *TDR: The Drama Review* 54, no. 3: 71–86.
- Painter, Corinne. 2016. "Non-human Animals within Contemporary Capitalism: A Marxist Account of Non-human Animal Liberation." *Capital and Class* 40, no. 2: 1–19.
- Pande, Amrita. 2014. *Wombs in Labor: Transnational Commercial Surrogacy in India*. New York: Columbia University Press.
- Perlo, Katherine. 2002. "Marxism and the Underdog." *Society and Animals* 10, no. 3: 303–18. doi:10.1163/156853002320770092.
- Petracci, Massimiliano, et al. 2015. "Meat Quality in Fast-Growing Broiler Chickens." *World's Poultry Science Journal* 71, no. 2: 363–74. doi:10.1017/S0043933915000367.
- Pratt, Mary Louise. 1991. "Arts of the Contact Zone." *Profession*, 33–40. www.jstor.org/stable/25595469.
- Pratt, Mary Louise. 2008. *Imperial Eyes: Travel Writing and Transculturation*. Abingdon, UK: Routledge.
- Quandt, Sara A., et al. 2012. "3-D Jobs and Health Disparities: The Health Implications of Latino Chicken Catchers' Working Conditions." *American Journal of Industrial Medicine* 56, no. 2: 206–15. doi:10.1002/ajim.22072.
- Read, Jason. 2017. "Anthropocene and Anthropogenesis: Philosophical Anthropology and the Ends of Man." *South Atlantic Quarterly* 116, no. 2: 257–73. doi:10.1215/00382876-3829390.
- Reggio, Marco. 2016. "La resistenza viene prima: Gli animali di Michael Hardt" ("The Resistance Comes First: The Animals of Michael Hardt"). *Resistenza Animale* (blog), October 3. resistenzanimale.noblogs.org/post/2016/10/03/la-resistenza-viene-prima-gli-animale-di-michael-hardt.
- Rodenburg, Jack. 2016. "Changes in Dairy Farm Management Strategies with the Adoption of Robotic Milking." *Journal of Animal Science* 94, no. S5: S16. doi:10.2527/jam2016-0033.

- Schilling, M. W., et al. 2008. "The Effects of Chicken Catching on Broiler Breast Meat Quality." *Meat Science* 79, no. 1: 163–71.
- Sexton, Jared. 2010. "People-of-Color-Blindness: Notes on the Afterlife of Slavery." *Social Text* 28, no. 2: 31–56. doi.org/10.1215/01642472-2009-066.
- Sexton, Jared. 2011. "The Social Life of Social Death: On Afro-Pessimism and Black Optimism." *InTensions*, no. 5. www.yorku.ca/intent/issue5/articles/jaredsexton.php.
- Shaikh, Anwar. 1977. "Marx's Theory of Value and the 'Transformation Problem.'" In *The Subtle Anatomy of Capitalism*, edited by Jesse Schwartz, 106–39. Santa Monica, CA: Good-year Publishing.
- Spiegel, Marjorie. 1996. *The Dreaded Comparison: Human and Animal Slavery*. New York: Mirror Books.
- Stanescu, James. 2013. "Beyond Biopolitics: Animal Studies, Factory Farms, and the Advent of Deading Life." *PhaenEx* 8, no. 2: 135–60.
- Stokholm, N. M., et al. 2010. "Causes of Mortality in Commercial Organic Layers in Denmark." *Avian Diseases* 54, no. 4: 1241–50.
- Stuart, Diana, Rebecca L. Schewe, and Ryan Gunderson. 2013. "Extending Social Theory to Farm Animals: Addressing Alienation in the Dairy Sector." *Sociologia Ruralis* 53, no. 2: 201–22. doi:10.1111/soru.12005.
- Stuesse, Angela. 2016. *Scratching out a Living: Latinos, Race, and Work in the Deep South*. Berkeley: University of California Press.
- Tabler, G. T., I. L. Berry, and A. M. Mendenhall. 2004. "Mortality Patterns Associated with Commercial Broiler Production." The Poultry Site, December 13. www.thepoultrysite.com/articles/253/mortality-patterns-associated-with-commercial-broiler-production.
- Tallentire, Craig, W., Ilkka Leinonen, and Ilias Kyriazakis. 2016. "Breeding for Efficiency in the Broiler Chicken: A Review." *Agronomy for Sustainable Development* 36: 66. doi.org/10.1007/s13593-016-0398-2.
- Torres, Bob. 2007. *Making a Killing: The Political Economy of Animal Rights*. Oakland, CA: AK Press.
- Vince, Gaia. 2012. "How the World's Oceans Could Be Running out of Fish." BBC, September 21. www.bbc.com/future/story/20120920-are-we-running-out-of-fish.
- Wadiwel, Dinesh. 2015. *The War against Animals*. Leiden: Koninklijke Brill.
- Wadiwel, Dinesh. 2016. "Do Fish Resist?" *Cultural Studies Review* 22, no. 1: 196–242.
- Weeks, Claire A. 2007. "Poultry Handling and Transport." In *Livestock Handling and Transport*, 3rd ed., edited by Temple Grandin, 295–311. Wallingford, UK: CAB Publishers.
- Wilderson, Frank B., III. 2010. *Red, White, and Black: Cinema and the Structure of U.S. Antagonisms*. Durham, NC: Duke University Press.
- Wolfe, Cary. 2012. *Before the Law: Human and Other Animals in a Biopolitical Frame*. Chicago: Chicago University Press.