

Forums

Ghosts and Things: Agriculture and Animal Life

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Abstract

This article makes a case for centering animal life in conceptions of environmental, agrarian, and dietary change. It begins with a brief discussion of the extinction spasm and defaunation and suggests that envisaging landscapes of animal “ghosts” might help to evoke the ecological impoverishment this entails. Landscapes of ghosts are then set against the soaring populations of animals in industrial livestock production, stressing both the extensive biophysical implications and the intensive interspecies relations of these systems, in which individual animals can be seen to be reduced to little more than fungible “things.” The core argument is that the fast-changing conditions of both wild and domesticated animals, and their interrelationships, are an important and often underappreciated aspect of global agrarian, and efforts to confront this course are fundamental to prospects for a more sustainable world.

Centuries from now the present era may well be remembered for the way in which social relations came to be dominated by the institution of commodity exchange, and for the concomitant destruction of many of the species and landscapes with which we share this planet.

—Jack Kloppenborg (2000, 509–510)

Although they are a pervasive part of modern societies, the dynamics of commodification and biodiversity loss can be hard for people to see and process. This article argues that the fast-changing conditions facing nonhuman animals are at once a crucial aspect of these dynamics and a potentially powerful way of illuminating them, presenting a way to think about two of the defining trajectories of animal life. The article starts by considering the biodiversity crisis in terms of endangerment and population declines among nonhuman animals and suggests that envisaging landscapes of animal “ghosts” might help to evoke this widespread impoverishment of ecosystems. It then considers the role of industrial livestock production as a force both in habitat degradation and in reshaping the conditions of life for a large and growing share of the world’s mammal and bird populations, which can be seen to be reduced to little more than fungible “things,” hidden

within agricultural landscapes and complex, long-distance supply chains as their lives go disregarded in consumption.

Taken together, the lens of animal ghosts and things attempts to draw the acceleration of commodification and the violence of biological simplification into focus in a persuasive new way that compels attention to the growing exploitation of animals—in both its sprawling implications and in the intensive interspecies violence. To appreciate how interspecies relations are being shaped and concealed in modern agro-food systems also reflects how immense power imbalances distort narratives about sustainability, limiting what counts and what does not and what is seen to be contestable. The ultimate aim is to highlight why the challenge of reducing animal production and consumption on a world scale should be a central subject in conversations about the global environmental politics of food.

Landscapes of Ghosts: Animals in an Age of Biological Annihilation

The *sixth extinction spasm* has been recognized by evolutionary biologists for some time and has recently begun to receive much popular attention (Kolbert 2013; Leakey and Lewin 1995; Schlossberg 2017; Vaughan 2015). While debates swirl around its precise pace and magnitude, and there is tremendous complexity in understanding species interrelationships and responses to habitat loss, modification, and fragmentation, the core elements of the extinction spasm are clear to such an extent that normally restrained scientists are describing it with loud, desperate terms like “biological annihilation” (Ceballos et al. 2017). Yet, with a few exceptions (Crist et al. 2017; Machovina et al. 2015; Ripple et al. 2015), desperate calls about the biodiversity crisis tend to underplay or evade a powerful correlation: the exploding livestock production and consumption.

Plants and invertebrates make up the bulk of species going extinct each year, but the biodiversity crisis resonates most powerfully through the threats to animals, birds, and amphibians, where species numbers are much smaller. The Millennium Ecosystem Assessment (2005) projected that, on the current course, more than 12 percent of all birds, 25 percent of all mammals, and 32 percent of all fish will be pushed to extinction over the coming century, and the IUCN Red List indicates similar levels of endangerment (International Union for Conservation of Nature and Natural Resources 2017; Monastersky 2014). The reduction and fragmentation of habitats are at the heart of most assessments of extinction risk, compounded by other stresses, such as invasive species and pollution, but climate change is increasingly recognized as a threat of similar magnitude that interacts dangerously with habitat loss. For many terrestrial animals, the physiological strain posed by new temperature and moisture patterns and extremes is expected to exceed the pace of evolutionary adaptation, with migration across fragmented landscapes often difficult or impossible,

compounded by the probability of shifting distributions of pests, pathogens, and invasive species. There is considerable evidence that animal migration poleward and upward in elevation is speeding up, but landscapes are filled with barriers, and there are no guarantees that new niches will be there to accommodate them (Ceballos et al. 2017; Dirzo et al. 2014; WWF 2016). For animals in marine environments, the threats from climate change are ever more linked to the growing understanding of the peril of changing ocean chemistry (Hofmann and Schellnhuber 2010; Sale 2011; WWF 2016).

As important as extinction threats and events are, Dirzo et al. (2014, 401) stress that this is “only a small part of the actual loss of biodiversity,” and they advocate the concept of *defaunation* “to denote the loss of both species and populations of wildlife, as well as local declines in abundance of individuals” and to signify its disruptive effect on ecosystem functioning. Metasurveys and projections present a range of challenges, such as estimating many past and present animal populations; understanding how shrinking and fragmenting habitats interact with multiple other stressors to affect the population health of various species; and analyzing how changing animal populations might reverberate on ecological dynamics, such as predator–prey relations. Still, as with extinctions and endangerment, the broad course of defaunation is clear enough, as mounting evidence points to precipitous population declines occurring across a wide range of nondomesticated animals (Dirzo et al. 2014; Ripple et al. 2015). The biannual Living Planet Index (WWF 2016) has done much to widen the profile of the problem, with estimates appearing in a stream of eye-popping headlines like “World Wildlife ‘Falls by 58% in 40 years’” (Morelle 2016) and “World on Track to Lose Two-Thirds of Wild Animals by 2020” (Carrington 2016).¹

Leading scholars of defaunation stress that ongoing research into the “life history characteristics” of animals will help to better understand the dynamics of population declines and inform conservation agendas (Dirzo et al. 2014), but already the concept of defaunation has much pedagogical value—most of all propelling a wider recognition of the biodiversity crisis beyond extinctions and endangerment. The term itself, however, is perhaps too esoteric to fire the popular imagination, and more intuitive language could help its essential message reach beyond the scientific literature. Conservation biologists have already provided some good possibilities, with images of “empty forests” (Redford 1992) and landscapes haunted by “ghosts,” the latter given by Grumbine (1992), to describe the extirpation of large mammals (grizzly bears) in a specific context (the Pacific Northwest). This notion of animal ghosts expresses a profound sense of devitalization—not only of ecosystem dynamics but of the spirit of landscapes—and could help spark new consciousness about the scope of biodiversity loss. But another step is needed to yield a fuller picture of the centrality of animals in ecological change.

1. The index is based on an assessment of nearly 4,000 representative vertebrate species since 1970, though there is some concern about data quality and extrapolations.

Unseen Things: The Extensive and Intensive Relations of Industrial Livestock Production

The imagery of animal ghosts haunting impoverished landscapes becomes more compelling when it is set against the fact that fast-rising livestock populations occupy a large share of all land, are a key factor in the biological simplification and standardization of agricultural landscapes, and bear significantly on climate change. This makes the growth of livestock populations an important dimension of habitat threats facing nondomesticated animals, which is interwoven with a momentous shift in consumption: the “meatification” of diets. Meatification is encapsulated in the fact that the average person in the world now eats nearly twice as much meat annually (43 kg/yr in 2014) as only two generations ago (23 kg/yr in 1961), amid human population growth from roughly 3 billion to more than 7 billion (Food and Agriculture Organization Statistics Division 2017).

In the early 1960s, there were roughly 7 billion livestock animals on earth at a given point in time, and roughly 8 billion animals were killed for food each year. Today, the livestock population is nearly four times larger (more than 25 billion), and eight times as many livestock animals are killed on an annual basis (more than 70 billion), reflecting the quickening turnover time from birth to slaughter (Food and Agriculture Organization Statistics Division 2017). Another helpful way of appreciating this growth is to recognize that these populations constitute by far the largest part of terrestrial mammalian and bird biomass (Crist et al. 2017; Machovina et al. 2015; Ripple et al. 2015; Smil 2013). Extensive herding and ranching cover 22–25 percent of all land, principally for cattle, followed by sheep and goats. Permanent crops cover 10–12 percent of all land, roughly one-third of which is in feed monocultures devoted to industrial livestock production (Ramankutty et al. 2008; Steinfeld et al. 2006). Poultry and pigs are at the forefront of growth in terms of both the volume of production and individual animal lives, accounting for over 70 percent of global meat production by volume and the vast majority of animals killed for food every year, and their industrial production is expected to drive nearly all further increases (D’Silva and Webster 2010; Steinfeld et al. 2006; Weis 2016).

To appreciate the implications of industrial livestock production for biodiversity, it must be understood at once as a spatially expansive enterprise, commanding “oceans” of monocultures, and a highly concentrated one, with animals packed densely into resource- and pollution-intensive “islands.” The fundamental organizing imperative in both these oceans and islands is the pursuit of economies of scale, which depends on the radical biological simplification and standardization of productive environments (and which impels the physical disarticulation of fields and animals). In sweeping aside attention to diversity, crop complementarity, and regenerative cycles—the historic basis of any durable agricultural system through history—the pursuit of scale in agriculture creates or worsens a series of biological and physical problems that must be continually overridden through an array of external inputs (Weis 2010),

a transformation that is in turn entwined with the consolidation of power in seeds, chemicals, animal breeding, pharmaceuticals, and grain and livestock processing (IPES-Food 2017).

In polarized narratives of agricultural sustainability, champions of high-input monocultures portray yield gains as the key to reducing the environmental impacts of agriculture. High yields, it is claimed, enable “land sparing” because they have the potential to reduce the amount of land that needs to be cultivated to meet food needs, thereby freeing it for other uses. This has become a prominent narrative, though it is very dubious for many reasons.

First, all agricultural systems are not equally damaging for biodiversity. In addition to being veritable wastelands for most animals, industrial monocultures contribute to a range of ecological problems beyond the farm, including (1) nutrient loading from fertilizers, which is a major factor in algal blooms in many freshwater and nearshore marine environments; (2) proliferating toxicity associated with the perpetual chemical war on insects, weeds, and fungi; (3) both established and unpredictable risks associated with increasing use of genetically modified organisms; (4) prodigious freshwater diversions (and associated long-term risks of salinization); and (5) greenhouse gas emissions from large machines, the manufacture and movement of inputs (fertilizers, pesticides, and seeds), irrigation pumping, and the additional distances agro-food products must move across specialized landscapes (McIntyre et al. 2009; Sage 2012; Weis 2010).

Second, even if the many un- or underaccounted ecological costs of industrial monocultures are set aside, the definition of land-use efficiency is not reducible to yield increases. Multicropped systems with lower yields and external inputs, but much more labor intensity, planting density, and mutually beneficial crop associations, can achieve more net nutritional output per land area than industrial monocultures (Koochafkan et al. 2012; McIntyre et al. 2009).

Third, it is disingenuous to assume that pressures to cultivate land would subside if only there were more total agricultural production on existing cropland, even if through industrial monocultures that shed labor and displace small farms. This illusion washes over the problem that many people are too poor to purchase all their food needs—a basic reason why industrial monocultures can never feed the whole world no matter how great their productivity.

The matter of unequal effective demand also relates to a fourth point that itself obliterates the portrayal of industrial monocultures as land sparing. As indicated, nearly one-third of the world’s cropland is devoted to livestock feed, and much of the useable nutrition contained in crops is burned in the metabolic processes of animals. This nutritional wastage compels the occupation of more land than is necessary for agriculture, along with more water withdrawals, GHG emissions, and pollution loads, and hence more lost and despoiled habitats for other species (Crist et al. 2017; Machovina et al. 2015; Pimentel and Pimentel 2003; Weis 2013).

The ecological burden grows further with the resource and pollution intensity of factory farms, feedlots, and slaughterhouses (D’Silva and Webster

2010; Imhoff 2011; Weis 2013). As with industrial monocultures, extraordinary productivity gains have been achieved with livestock through innovations in industrial design and biogenetics, led by chickens and pigs, while the failure to account for many costs partly obscures their unsustainable foundation. Confinement at great densities simultaneously eliminates much of the human labor of animal rearing and reduces the energy that animals can exert, or “waste,” on nonproductive metabolic processes (anything other than weight gain, laying, lactation), complemented in many instances by the manipulation of temperatures and diurnal rhythms in factory farms, part of the energy budget of these spaces. Animal genetics have been radically altered to grow, lay, and lactate faster while tolerating confinement, which ties to the design of patentable traits, the decline of genetic diversity, and the establishment of specialized subpopulations for breeding.²

But yield gains and speeding turnover time belie the fact that animals do not fit easily into the pursuit of economies of scale. Enormous accumulations of biowastes and heightened disease risks necessitate elaborate sewage and ventilation systems and chronic antibiotic use, which lead to GHG emissions, localized airborne pollutants, excessive nutrient loads, and public health risks, most notably the risk that antibiotics will become less effective and pathogens more virulent over time. Pathological behaviors (both self-harm and aggression toward neighbors) induced by crowding, immobility, monotony, and stifled desires are managed through systematic physical mutilations, cutting off such things as beaks, tails, needle teeth, and testicles. The pressure to both speed up and standardize reproduction hinges on artificial insemination, better understood as the relentless sexual assault of animals (Davis 2017). The pursuit of scale also manifests in fewer and bigger slaughterhouses and packing plants, which means longer average transport and greater mechanization of killing and processing animals, though human dexterity and reactivity are still needed—at least until artificial intelligence is integrated into assembly-line robotics. For the time being, the violence of work rings out in various job names: “kill men, sticker-bleeders, tail-rippers, leggers, butters, flankers, head-skinners, head-chisellers, gutters, and back-splitters” (Foer 2009, 103).

Much as better understanding the life history characteristics of wild animals can shed new light on *defaunation*, bearing in mind the life history characteristics of animals in industrial livestock production points to how animals are conceived as little more than commodities, or what could be called *commodi-faunation*, in that the design of productive environments is geared toward overwhelming the entirety of each animal’s being, depriving individuals of movement, play, mental stimulation, maternal bonds, and maturation (nearly all are killed as juveniles). The process of *commodi-faunation* is braced by a combination of physical and *cognitive* distance. That is, even as interspecies violence is expanding, it is

2. Following the course of seeds, animal reproduction is progressively moving away from farms and toward specialized breeding sites from which infants are purchased.

becoming increasingly invisible, buried in inconspicuous factory farms, feedlots, and slaughterhouses, enabling people to ethically detach their consumption of animals from the suffering with which it is entangled.

As with defaunation, there is a possibility that commodi-faunation sounds too obscure, and insofar as plainer language might resonate better, another way to describe this trajectory is that a growing share of the world's mammalian and bird populations is being reduced to little more than fungible "things."

Conclusions

Industrial monocultures and livestock operations have enabled extremely unequal and unsustainable patterns of dietary change. These systems entail biological simplification and standardization on a vast scale, along with wide-ranging resource budgets and pollution loads. Together, they are a major force in the loss and despoliation of habitats, especially through the expanded land and water needed for agriculture and the impact on climate change. Yet, despite their magnitude, these implications can be difficult to fathom, in part because of how the complexity and distance of agro-food commodity chains impede consciousness about productive environments at the point of consumption.

This article makes a case for clearer thinking about animal life in conceptions of sustainability and as an underappreciated facet of the deep power imbalances that prevail in agro-food systems. It suggests that centering attention to animals in the twin dynamics of biodiversity loss and commodification has the potential to make the huge but hazy course of agrarian and dietary change more visible—and the need to confront it more urgent. The imagery of landscapes haunted by animal ghosts seeks to convey a sense of the extensive interspecies violence of biological simplification and standardization, and to do so in a way that extends the realm of concern from a focus on extinctions and endangerment to pervasive population declines among nonthreatened species. At the same time as many animal species are declining and at risk of disappearing altogether, agricultural landscapes increasingly conceal massive populations of a small number of livestock animals, reared in radically different ways and consumed at much higher per capita levels than ever before. The imagery of animals as unseen things in industrial livestock seeks to convey the intensive interspecies violence of these systems, signaling the total domination of animal lives and disregard for their anguish. It also suggests magnitude and how these systems contain a rising magnitude of total animal biomass on earth with far-reaching influence.

To see a world of animal ghosts and things unfolding together is to insist that dramatic population changes—many crashing and a few spiking—cannot be separated from the nature of interspecies relations in industrial production. This is ultimately meant to accentuate the destructive connection between agrarian and dietary change and why reducing animal production and consumption must be a key object of environmental and food policy and activism.

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