Neoliberalism's Climate

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"The climate system is natural capital … capital created by nature, not us … an asset that is … valuable because it generates a flow of services over time." - Geoffrey Heal (2015)

Is it useful to label the current political era "neoliberal"? Those of us who think that it is are in roughly the same predicament as periodizing historians of music. We have to explain not only what is importantly new about the period we single out as significant, but also how it grew out of what went before. This chapter defends the term "neoliberal" as a significant category of historical analysis by arguing that what has been made of climate through a range of practices to which the label is attached is deeply novel, yet also multiply dependent on the ways in which climate has been co-constructed during preceding eras of imperialism and regulated industrial capitalism. Just as important musical eras reconstruct what music is in terms of, for example, its tonal organization or social embeddedness, so neoliberalism creatively reworks the capitalistic organizations of climate that it has inherited. Conversely, the construction of a planetary ecosystem service economy that includes climate plays a part in constituting and developing neoliberalism (see also Collard et al. 2016).

In investigating what count as climate and climate change for neoliberalism, then, a first step is to consider what they mean for capital. A crude, oversimplified analogy may help pave the way for a more extended analysis: capital tends to experience deleterious climate change in somewhat the same way that it experiences the degraded well-being of workers. What is this well-being, how much is really needed and by whom, and how might it be secured? That is, when, where, how, and to what degree must capital be restrained from "externalizing" costs onto the bodies and subsistence activities of workers? As negotiations unfold amid conflicting traditions of well-being and diverse medical transformations, new varieties of health become defined and entrenched in countless bureaucratic and regulatory actions and reactions. It is objects such as these that are subsequently privatized and converted into standardized, appropriable, deliverable 'units' under neoliberalism.

This chapter will begin its own particular tale of continuity in change by touching on various inherited aspects of neoliberalism's climate. In particular, it will review some of the circumstances in which, since colonial times, climate and society have been made to seem external to each other as part of larger movements toward organizing nature/human binaries and a "global environment" (Ingold 2000). Concrete ways of externalizing climate, it will suggest, have provided materials for the neoliberal innovations of climate rent and climate commodities in much the same way that concrete ways of externalizing land from human activities have played a part in widening land and labor markets. Climate as object of colonial management; as external determinant of or limit to human activities and biotic systems; as average weather which is nevertheless subject to change; as molecules and radiation; as chaotic but modellable global circulation system capable of independent agency – all have all been enlisted as material for characteristic neoliberal operations. Among the end results have been the following:

- Regulatory "boundaries" limiting the excesses of the accumulation process have been globalized, pollution made more abstract, and an expanded palette of compensations and equivalences pressed into service to help override local barriers to extraction, production and circulation.
- Climate change action has been transformed, largely through the agency of the state, into the

generation of tradable, priced and ownable units of molecular "mitigation".
- New forms of territory and rent have been created by the state and distributed to assorted elites.
- Industrial and financial powers have been both deresponsibilized and handed extended powers to define social choices.
- Meteorological forces have been enlisted in exploitation, oppression and capital accumulation in fresh ways.

Persisting histories of conflict

It has only been through discontinuous, varied, contested and fairly recent historical processes that some intellectual classes have come to be able to conceive of and propose climate as an internally-coherent worldwide physical system impinging on separately-constituted societies, economies and ecosystems and susceptible to being changed globally through external "forcings" or external technocratic management. The climate that many elites talk about today has been "extracted from the matrix of interdependencies that shape human life within the physical world, then, once isolated, elevated to the role of dominant predictor variable" (Hulme 2011: 247).

At most times in the past – as in most places today – what is currently referred to as "the climate" by environmentalists, national states, the UN and climatologists as a whole would likely have been regarded as an aspect of an exotic, newly exploitative kind of politics. From this point of view, climate is neither natural nor social nor a hybrid of the two, but bound up into "substantial, living forms" and part of the "active formation of the lived environment" (Taylor 2015: 39). For example, in Tibet, when weather, there regarded as part of a complex of specific qualitative relations among humans and nonhumans, encountered postwar Euro-American climatology (Huber and Pedersen 1997), what resulted was not an adversarial "politics of knowledge" or disagreement about how to interpret an external world, but rather a "staggered transformation of the socio-ecology of the Tibetan plateau in which lives and livelihoods were slowly drawn into a new field of relations with different forms of political authority, organizations of labor, changing social hierarchies and new means of ordering the landscape" (Taylor 2015: 39).

Such encounters are emblems of a persisting history of friction over the complex nets of relationships that influence what weather or climate are supposed to be. This history is extremely heterogeneous and contingent. Even within the relatively small world of climate science, for example, huge shifts have taken place over the past 150 years. At first, climate science was a geographically-oriented study "describing the collective effect of local atmospheric phenomena on human senses" (Fleming and Jankovic 2011). To describe "climate" *was* to describe differences among different locations; "global climate" would have been close to a contradiction in terms (Heymann 2011). Later on, in part through the varied and idiosyncratic agencies of globally-linked measurement bureaucracies, flight and space technologies, and computers, climatology became almost exclusively a physically-oriented study treating not only large-scale weather systems, but also oceans, mountain uplift, photosynthesis and the rest of a unified "earth system" considered as an isolatable mechanism. Focusing less on variations across space, it concentrated increasingly on variations over time.

Such changes – and there are many more in the history of climate – are resistant to having any simple pattern imposed on them. Yet, over the long term, numerous processes of externalization and abstraction of climate and society from each other are discernible. These processes have both reflected and helped to constitute capitalist and colonialist interests. They have also played a deep role in political conflict. For example, the earlier view that climates and latitude zones were

interchangeable – ultimately traceable at least as far back as Hippocrates – became by the 18th century a tool that, from a distance, "enabled an entrepreneur to wield expertise in the geography of colonial investment" (Jankovic 2010: 204) and comparative advantage by explaining the different kinds of "productiveness" or profitability of different regions – in addition to justifying the dominance of imperialist societies through an association of climate with social attributes ("heat encourages laziness and backwardness") that has survived down to the present even among liberal thinkers (e.g., Galbraith 1979). Through fitful processes involving globalization and "real subsumption" of space and time, climate was gradually becoming one of the so-called "abstract" natures characteristic of societies dominated by the imperatives of capital accumulation (Moore 2015).

Early colonial discussions and actions on observed *changes* in climate can also be seen as important steps in the abstraction of climate from culture that has provided a foundation for neoliberalism's innovations, whether climatic shifts were seen as potentially manageable threats to colonial production (as on various island colonies and in India) (Grove 1997); the benign result of civilizing European influence and the displacement of indigenous peoples (as in North America) (Vogel 2011); or the dire outcome of a Spanish imperialism insensitive to the balance of nature (as in the discourse of Alexander von Humboldt about the drying up of regions of Venezuela and Peru) (Cushman 2011). The climate that was seen as changing in all of these instances had not yet been separated out into the pure, integrated, three-dimensional worldwide physical agent or force that intellectuals and politicians talk about today. Yet these earlier efforts to isolate or manage it frequently involved a kind of oppression that continues in the neoliberal age in parallel forms (see below: Three Aspects of Neoliberalism's Climate).

Systems and contexts

The 18th and 19th centuries saw the development of many technologies of industrial control that ultimately also proved crucial to neoliberal construals of climate. Automatic feedback control devices ranging from steam engine governors to thermostats and gyroscopes had to be applied to industrial machinery. Malthus (2014[1798]) described a population servomechanism that would keep returning human societies to a condition resembling the brutal transitional capitalism of his day. Fossil-fuelled steam and electrical power, in addition to opening a new era in labor discipline and productivity, further encouraged conceptions of communication as a dynamic, complex form of dominion, in which responses to management could be reduced to feedback for eliciting control adjustments (Beniger 1986).

Early in the 20th century, European colonies nourished the developing science of ecology and ecosystems, as they had nourished forestry before it, resulting in investigations into energy flows in various habitats and connections between climate fluctuations. Later on, the Second World War became a crucible of forced interdisciplinarity that gave rise to intricately interlinked innovations including systems analysis, cybernetics, game theory, nuclear weapons, modern computers and artificial intelligence, all of which greatly elaborated the control systems that had accompanied the increased material and energy flows of the industrial revolution. As continued military funding encouraged the development of new kinds of human-machine couplings ranging from computerized flight simulators to interactive computing, the bloodline of postwar cybernetics crossed with that of earlier, imperialism-infused ecosystem thinking. Organisms, animal societies and ecosystems alike were theorized by eminent ecologists such as E. P. and H. T. Odum and E. O. Wilson as command-control-communication systems involving multiple feedback loops (Elichirigoity 1999: 33-36; Haraway 1991: 62-68). Meanwhile, Second World War artillery-targeting analogue servomechanisms morphed not only into giant digital nuclear weapons command-and-control

systems encompassing the North American continent but also into James Lovelock's NASA-backed models of Gaia, the “living planet”.

Economics and management sciences, always susceptible to the charm of machine metaphors, were meanwhile undergoing their own cyborg makeovers, challenged by the postwar expansion of industrial society and influenced by Cold War systems thinkers like John von Neumann and Jay Forrester (Mirowski 2002). It was, again, around the time of the Second World War that quasi-cybernetic concepts like “economic model”, “simulation” and “price signal” really began to take hold, and that Friedrich von Hayek began to try to configure economic relations across society as an information-processing device superior to conventional statistics-based attempts to predict and control (Cooper 2011). It was not entirely a coincidence, in short, that some of the innovations foundational to neoliberalism and to climate modelling emerged roughly in parallel.

The channelling of expertise into the modelling of systems helped update older nature/society, fact/value and science/policy dichotomies into a “systems/context” dualism – linked, like its ancestors, to capitalist production, management and, to a certain extent, property creation. If conventional scientists continued to work hard to give the “untidy world of the laboratory the appearance of perfectly regulated order” (Collins and Kusch 1999: 141), systems experts began to arrange computer-housed multiple feedback simulations in ways that also allowed tendencies toward “balance” or “resilience” to be attributed to external natures. Shaped partly by computer evolution and other institutional developments, climatology underwent an accelerated hypertrophy of physical data collection, simulation and theorization accompanied by a continuing atrophy of political, historical and geographical analysis. Just as what mainstream economics labored to isolate – aided by an institutional hypertrophy of statistics-creating techniques and sophisticated mathematical modelling procedures that tended to pass over labor exploitation, say, or the political ecology of fossil fuels – was a discrete “economic system” that an external “state” interfered with at its peril, so too Global Circulation Models and Integrated Assessment Models helped limn a binary comprising, on the one hand, a coherent global “climate system” and, on the other, an external, residual “context” or “social system” category into which everything else was implicitly unloaded, including political decisions, individual preferences, class struggle, oil company strategy, an “expanding range of ideologies” (Hulme 2008: 9), and other matters seemingly less modellable, predictable or controllable. “The global knowledge that the Intergovernmental Panel on Climate Change produces,” as Fogel puts it, “helps governments erect and then justify their simplified constructions of people and nature, and the institutions based on them” (2004: 109).

In one sense, this way of treating the whole planet – whether seen as stocks of resources, flows of ecosystem services, or low-cost natural infrastructure – as a “system amenable to management” (Elichigoity 1999: 37) merely carried forward older appropriationist traditions. Nature was still an ahistorical something-or-other that was subject to prediction and control and that offered specifiable external limits to economic managers bent on profit. It remained relatively constant and self-repairing, given proper oversight (O'Neill 2001). As such, its supposed existence continued to serve as a rationale for the enclosure of commons and a riposte to commoners' claim of the right of all to survival in environments that were typically assumed to require a safety-first approach. While anthropologists trying to “restore” various human groups to some past, supposedly static condition, or to maintain them in their current status, were increasingly forced to confront charges of racism, restoration ecologists and ecosystem stabilizers faced parallel accusations generally only from indigenous peoples (Cruikshank 2005). Yet the systems approach did represent something new at least in that it helped neoliberals develop their trademark claim of being able to tackle all social issues largely through price discovery. In this neoliberal vision, capital's unstoppable creation of new externalities, as well as increasingly unequal thermodynamic exchange (Hornborg 2012),

disappeared in a shimmering spectacle of a late 20th-century perpetual motion machine regulated by green economic feedback mechanisms.

Yet if, as Marx had urged, capital is nothing if it does not accumulate, so the new perpetual-motion "economy" was nothing if it did not "grow". The first big takeoff in the use of the phrase "economic growth" – now so central to international discourse – occurred between 1948 and 1966 (Google 2015). How to square this reality with the new "closed system" norms? The Club of Rome channelled Malthus in insisting that there were "limits to growth". As environmental economics and ecological modernization policies proliferated, other specialists envisaged an ecosystem-like, stable version of capital accumulation in which "value could conceivably grow forever, but the physical mass in which value inheres must conform to a steady state" (Daly 1980: 6). Many economists and scientists posited entities called "renewable resources", which were supposed to be indefinitely exploitable as long as a calculable, more or less linear schedule for their replenishment was respected.

Predictably, such conceptions ran up against stubborn contradictions and resistances. Yet rather than simply eroding the systems/context binary in a linear fashion, some of these forced it to develop in ways that helped sustain it for decades. The US environmental movements of the 1960s and 1970s, for example, pressured the country's federal government to enact environmental legislation with some decidedly non-cybernetic aspects. US pollution-control legislation of the early 1970s was not set out in cost-benefit terms, but required "attainment of national standards" at individual points of emission using particular technologies. By 1975, however, it was possible to say that the Clean Air Act was threatening the expansion of polluting energy and manufacturing industries in many states (Lane 2015: 28), and thus impeded "economic growth". The US Environmental Protection Agency duly redefined pollution as something to be aggregated, regulated and traded within larger and larger "bubbles" using any means available, not something that occurred at particular sites and had to be fought using specified technologies. By changing what pollution was – and indeed what territory and jurisdiction were (Rice 2010) – it made it cheaper for private firms to maintain compliance with laws regulating it. Before long, the Reagan regime was requiring federal environmental legislation to pass cost-benefit tests – a commensuration technique that had already been altering the nature of "nature" for half a century. By the early 1990s, a nationwide sulfur dioxide trading program was in operation, relieving pressures for innovation in pollution-control technology.

Climate trading as system

Climate change too soon had to be integrated with "the economy" and commensurated with other features of the obligatory two-dimensional systems diagrams so that it could be governed "efficiently" according to investment standards. A new climate had to be discovered to sit alongside other emergent natures of the neoliberal era. From early on in the neoliberal era, some intellectuals were asserting the existence of scarce "atmospheric resources" whose value could be determined in order to "decide whether they are worth controlling, and in what way they should be controlled" (Maunder 1970). Others posited the existence of a type of climate that could be "stabilized" at either high cost or low cost (e.g., Lovins and Lovins 1991). Eventually, many experts converged on the view that states might someday not only be able to suggest optimal global temperature increases, but also to estimate roughly how far greenhouse gas pollution needed be capped to keep temperatures below that level and to limit emissions accordingly.

In the 1990s, climate-as-molecules and prices-as-natural-signals fused in the hybrid system of carbon trading, which proved to be one of neoliberalism's landmark innovations. Under US pressure

in Kyoto in 1997, the parties to the UN Framework Convention on Climate Change adopted greenhouse gas markets as an "economically rational" management response to global warming. In the 2000s, Europe moved into the lead in transforming potentially investment-threatening public concerns about climate into a supposedly "depoliticized" market for ecosystem services through the European Union Emissions Trading Scheme (EU ETS). Both the Kyoto Protocol's carbon market and the EU ETS combined "bubble" and "offset" systems, allowing for the circulation of a huge variety of interchangeable tokens or units of pollution compensation. To quote the words one climate market proponent, Pedro Moura Costa of Brazil's Bolsa Verde, the idea was to "transform environmental legislation into tradable instruments" (Nicholls 2011:n.p.). After having helped to construct a regulatable, nonhuman climate, in other words, national states and the UN then unitized it and made it circulatable.

The units in question facilitated the creation of a "climate rent" (Felli 2014) that could be charged by polluting industries to the rest of society. European states were now able to appropriate quantifiable, tradable slices of the earth's carbon-cycling capacity and deliver them to their largest corporate emitters in proportion to their prior use of it. Both inside and outside the Kyoto and EU ETS markets, polluters were also provided with mechanisms to supplement these holdings by cheaply annexing various climate change-mitigating capacities outside the "bubble" in the form of "offsets", further reducing their costs. For example, a project which reduced HFC-23 emissions from an industrial plant in Korea beyond the level that consultants specified "would have been the case without the project" could produce cheap credits for sale to European industries which legally empowered them to use or sell on equivalent entitlements to the earth's carbon-cycling capacity. Similarly, the molecule-based systems fiction that fossil fuel combustion could be "neutralized" by adapting land, trees and crops for maximum carbon absorption helped perpetuate the technopolitical structures facilitating the disastrous flow of prehistoric carbon out of the ground into the earth's oceans, atmosphere and land surface, where it continued to accumulate. Investor freedom – already long protected by a society/nature divide whose "nature" component was claimed to be defensible through "limits" – was further extended by the unitization of the limited territory and a trade in climate services.

True to form, the systems/context dualism inherent in the new markets helped them not only to survive over a two-decade stretch of proliferating failures, but even to spread to new jurisdictions. The collapse of successive attempts to make carbon markets "work" as advertised – for example, delaying auctions to relieve pollution rights oversupply, abolishing certain kinds of offsets, taking action against corruption, promising to auction a greater proportion of permits in the future rather than giving so many away for free – could always be attributed to political context, leaving the postulated "system" free of blame (e.g., Hahn and Stavins 1995; Hahnel 2012a, 2012b) while facilitating further delays and dispossession. Carbon markets and the regulatory nature on which they were based were also justified, at least provisionally, on grounds of heuristics. It was not that anyone "really" believed that given the right carbon emissions budget or limits on temperature rise (2 degrees Celsius, say, or maybe 1.5 degrees, or maybe 4 degrees), the earth's climate would maintain equilibrium with a quantifiable degree of certainty (Boykoff et al. 2010), or could be relied upon to continue to provide a manageable environment for a certain level of global GDP. Nor did anybody think that the scarcity provided by the weak caps legislated under the Kyoto Protocol or the EU ETS was enough for the economic "system" to function in a way that could seriously address global warming. But experts did continue to propound the claim that trading in scarce pollution permits fashioned out of state-regulated caps, limits and "planetary boundaries" (and out of the financial mechanisms required for their circulation) must somehow be a "step in the right direction". The existing inadequate caps were, it was implied, merely stand-in or temporary values to get the economic-ecological machine up and running until such time as better numbers from

scientist/economist/policymaker collaborations became politically possible.

The detailed political mechanics of commensuration, however, could not but spell eventual trouble for the new climate. As many observers pointed out, in the science/policy process, models for optimizing climate change had a way of becoming "truth machines" rather than just heuristics or tools for policymakers to think with, bringing economists' climate into increasing conflict with that of climatologists (Wynne and Shackley 1994; Randalls 2011). For carbon markets to be seen as environmentally relevant, moreover, some correlation had to be posited between the number of carbon permits in circulation and increments of climate stability, no matter how lax the caps were out of which the permits were made; yet it was obvious to serious analysts that carbon trading was actually exacerbating the climate crisis by, among other things, licensing increased exploitation of fossil fuels. To make matters worse, a second cybernetic wave was eating away at the picture of sustainable appropriation associated with the new market-friendly natures. This wave came partly from the increased mathematical power of computer weather modelling itself, which over time had revealed climate's unpredictability (Cooper 2010, 2011). It was perhaps not coincidental that second-order complex systems and nonequilibrium ecology theory came to prominence in an era in which profit crisis, the demise of Bretton Woods exchange-rate governance, and the decline of Fordism was encouraging new waves of disaster capitalism. Instead of attempting to minimize the role of the unexpected as an "outlier", many theorists embraced it as an investment strategy; even the debt associated with traditional investments in sites with cheap labour was increasingly linked to esoteric financial products, which, despite having been labeled as "derivatives", began to dominate economic interactions. Human-nonhuman relations aimed at eliciting sustainable yields from an external nature from which human activity had been erased began to seem actively at odds with relations that encouraged the "resilience" that was needed to "absorb and accommodate future events in whatever unexpected form they may take" (Holling 1973: 21; Boykoff et al. 2010) – including climate events. Growth itself began to be seen less as steady and predictable than as non-linear, discontinuous and dependent on periodic disturbance, disorder and collapse – together with the adaptability and flexibility that could take advantage of them (Nelson 2015). The right of all to survival in a commons became counterposed less to the vision of a passive and stable nature than to a valorization of *sauve qui peut* in a capricious world.

As mathematical probabilities and linear extrapolations were partly replaced by multiple images of starkly different possible futures, "scenario planning" came into its own at institutions ranging from the World Economic Forum to the US's National Intelligence Council, as well as in much scientific practice. Today, Pentagon strategists consult Hollywood screenwriters alongside old-timey systems analysts or compilers of actuarial tables. Quant inventions like the Black-Scholes-Merton option pricing formula are no longer imagined as unproblematic machines for the mass production of financial instruments, but are known to invite catastrophes (albeit potentially lucrative ones for those correctly positioned) unless they are constantly "repaired" *ad hoc* by human traders with instincts for the incalculable (Haug and Taleb 2010). Companies like Royal Dutch Shell toy with the predictability-dependent aspects of carbon trading not in opposition to, but in combination with, the search for innovative profit opportunities in unpredictable climate disasters (Funk 2015).

Three aspects of neoliberalism's climate

At least three aspects of neoliberalism's reorganization of climate merit brief emphasis. First, the standardized units required for the operation of a cybernetic economic-ecological system tend to be different from the units associated with a either a resource or conventional biological system or the elements identified in commons regimes. The contributions of capitalist non-resource nature to capital accumulation, as well as many of the ill effects of resource exploitation on communities, had

not usually been a matter for precise quantification. They were not broken down into marginal increments nor their management economically rationalized. The units into which nature was divided (for example, species or molecules) tended to serve other purposes. Conservation efforts tended to have multiple and heterogeneous justifications, including that of maintaining political stability or of preserving some aspect of nature "for itself". Pollution and pollution control mechanisms tended to be associated with particular conventionally-defined sites, regions, substances and agents. Neoliberal natures, on the other hand, tend to be divided into interchangeable "ecosystem service" units allowing aggregation, exchange and economic circulation. Just as the biological nature of ecosystem services is made up not only, for example, of species, but also of exchangeable "species equivalents", so too atmospheric circulation defined as an ecosystem service winds up being made up not only, for example, of molecules, but also of "molecule-equivalents" (for example, 333 CO_2/8.8 CH_4/1 NO_2/0.06 CFC-11) that are collectively certified to be equally destabilizing to the climate and that can all be traded one for another to provide the "same" services to an "economy" (MacKenzie 2009; Forster et al. 2007). Hence a power plant emitting one million tonnes of carbon dioxide per year need not be a source of pollution in the neoliberal sense of the term provided that it has contracted for one million tonnes of "offsets" per year from "carbon-absorbing" plantations in Indonesia or from "foregone" emissions attributed to refrigerant plant improvements in China; rather, it is said to be "carbon-neutral". As the location of pollution expands to a "bubble" where it can be diluted, or to the radius of a "bubble"-plus-"offsets" arrangement, so does the location of pollution control, abstracting nature's space yet further away from the daily work of communities or even national states while dis-locating environmental responsibility, usually in the direction of the disadvantaged. An "aggregate natural capital" (Helm 2014) forms a different kind of "limit" to industrial expansion than did the old disaggregated nature. The new interchangeable parts, of course, can also be used outside formal ecosystems markets. EU targets for climate-friendly "renewable" energy, for example, are being met partly by importing wood pellets harvested from US land and shipped across the Atlantic for firing in conventional thermal plants. Overall, a huge range of "performative equations" (Lohmann 2014) defining a standardized "climate benefit" unit (tCO_2e, or "tons of carbon dioxide equivalent") are stretching the spatial, temporal and logical ways of conceptualizing both pollution and climate itself.

Thus in the colonial era, a 10,000-hectare forest management area could never have been seen as a producer of, say, 500 tonnes of carbon sequestration services per year. This is not to say that many of the same human-nonhuman relationships and mechanisms of land control required for timber extraction or conventional colonialist conservation in such an area were not later pressed into service for extraction of climate services. Many foresters belonging to the tradition descending from 19th-century experts such as Dietrich Brandis have found employment in the new carbon service industry, measuring tree diameters and using satellite imagery to estimate sequestration rates. But at the same time, the new ecosystem services technocracy is to some degree split by low-intensity internal strife among "capitalists, scientists and regulators concerning value", the "functional interdependence of ecosystems", and so forth, as the imperatives of cyborg economics rub up against those of traditional conservation biology (Robertson 2012). These tensions are exacerbated by the fact that, as Antonio Tricarico (2014) points out, the new ecosystem commodities, unlike more traditional commodities such as wheat or oil, have been highly financialized from the outset, involving the development of complex procedures transforming the activities of nonhumans into financializable asset streams. For example, over 95 per cent of EU ETS transactions are speculative futures trades – not surprisingly, since each installation receives its state grant of pollution rights one year before it has to cover its emissions and must hedge against price uncertainties. The unavoidable conflict between the compliance and financial functions of the market that results renders ludicrous the already insupportable claim that it might someday have a positive effect on

weather and climate.

Second, the new nature is no less a nature defined by capitalist appropriation of commons and commons relationships than the older "resource" and "conservation" natures – even as it features a number of new twists. In the past, water sources might have been mined, without recompensing either indigenous peoples or the earth, in order to supply industrial plants or maintain industrial wheatfields supplying cheap food to urban workers. Today they can also be appropriated for ecosystem services aimed at reducing or obviating costs of reproduction as they are defined by environmental regulation. If classical industrial capitalism saw value as created mainly through the initiative, sacrifice or organizing ability of owners and managers rather than through the activities of workers, environmental policy in a neoliberal age sees the value of nature as dependent on applications of economic/ecological expertise to an external, nonhuman entity rather than the historical interactions of commoners and commons. Thus, for example, specialist-controlled seed banks or biosphere reserves occupy a position of honor as repositories of genetic information needed for biotic reboots of agriculture, while the role of "unbankings" or outgrowings of seeds to expose them to socionatural change is obscured. Tellingly, the role of indigenous peoples in the new green economy is mainly to work for wages as caretakers of a newly-constituted climate, or a newly-constituted "biodiversity", whose salient features have been defined by others who tend to work with an alien conception of nature (Ingold 2000). Offset calculations based on a new generation of storytelling practices meanwhile carry forward colonialist traditions of representing non-European societies and polities as a static, passive and predictable background to the creative actions of experts and the property-creating "improvements" of Europeans: in order to create quantified units of climate benefit for exchange, indigenous or "backward" polities necessarily have to be reduced to a single "emissions baseline" against which a variety of "pollution-saving" alternatives identified by specialists can be calculated, insured and financialized. As Andrew S. Matthews (2015) vividly puts it, "a nightmare of indigenous people destroying the forest becomes more valuable as it becomes more nightmarish, with an added caveat: the international money will not arrive unless you act to make the nightmare go away" by changing what indigenous peoples do.

Indeed, when viewed from an indigenous, peasant, feminist or ecological Marxist perspective, neoliberal natures look more like an elaboration of their pre-neoliberal industrial forebears than a radical alternative to them. Even the most advanced computer climate models succeed in adding credibility to the threat of catastrophic global warming only in the course of sharpening and enforcing a neo-Malthusian, depoliticizing opposition between a purified, monolithic "nature" and a purified, monolithic "society" – a homogeneously-defined *anthropos* packaged as an object subject to macroeconomic prediction and state governance. Over the decades, Global Circulation Models have selected and incorporated more and more nonhuman processes ranging from CO_2 and chloroflourocarbon molecule circulation to feedback cycles involving vegetation and cloud formation, adding a great deal of fine grain and density to the sense of an exclusively nonhuman "nature" while simultaneously obscuring the myriad connections linking such processes with, for example, the use of fossil fuels to discipline and increase the productivity of industrial labour (Malm 2014), international transport's need for refrigeration, and diverse indigenous and industrial land use practices. This movement of sorting and solidifying an "external" nature has been one with expanding a distinct "nonpolitical" class of bureaucratic scientists and economists equally "external" to peasants, workers, factory owners, administrators and indigenous societies; the more scientists have gone to work hunting, classifying, isolating and explicating physical processes in the contexts of laboratories, computer programs or wildernesses that have had human communities edited out of them, the more "external" that nature has become, and in turn the more crucial it has become to recruit specialists to understand it.

Within this setup, political action is forced to restrict itself to a rudimentary interface between the two structures, which consists of "anthropogenic emissions", "policy", "carbon prices" and the like. Mainstream climate politics becomes a matter of border controls between society and nature, not about questioning either the two entities themselves or the interface that has been constructed between them (Rouse 2002). As in the colonial era, the destructive effects of industrial capital are only allowed to be addressed or contained from "outside" the black-boxed dynamics of capital itself. This is part of the reason why terms like "coal companies", "labor" and "capital accumulation" (which would complicate the program of establishing simple, straightforward relationships between molecules and their would-be human managers) never appear in the documentation of the UN climate negotiations, why the international community remains unable to get to grips with the global warming challenge, and why it is so difficult to achieve recognition for climate as a labor, energy or civilizational issue. While oil or auto companies' financing of climate change denialist propaganda has been the more favored target of middle-class climate activists, dominant intellectual elites' modelling of climate as a "nature" disaggregated from political relationships has been incomparably more powerful in stymieing effective climate action. It is only when they are forced to acknowledge that there exists no uncontested baseline "external" to human societies to restore ecosystems to that environmentalists are compelled to concede that their desired states of affairs have to be negotiated among different groups of humans and nonhumans. It is only when they (for example) distinguish "survival emissions" from "luxury emissions" (Agarwal and Narain 1991) – two entities that refuse to stay on either side of the nature/society divide – that they recognize that climate cannot be defined by climatologists and policymakers alone.

Third, the new rents, commodities and markets that help define neoliberalism's climate are constructed and maintained overwhelmingly through the expanded activities of the state and international agencies. Carbon trading law stipulates that the climate system is the state's to manage and intervene in from "outside" as long as it does not venture too far into determining who produces what in which quantities, for whom, and at what price. State-regulated "caps", "limits" and "carbon budgets" define the scarce material out of which tradable units are constructed. State-driven and state-sanctioned quantification, monitoring, reporting, verifying and insuring techniques make offsetting possible. State police and military units take responsibility for the repression and policing of communities whose presence interferes with the efficient production of ecosystem service tokens (see Kill 2015; Lang 2015; Gilbertson and Cabello 2015 for some representative archives). Indeed, state agendas lie behind the very concept of ecosystems, from its earlier colonial incarnations to the military-financed development of the technologies underpinning General Circulation Models. In keeping with neoliberal tenets, moreover, the new climate is built in ways that help state as well as corporate actors evade much of the burden of addressing the social problems that markets are now advertised as cheaply solving. With the state underwriting the profits of a galaxy of private-sector partners, contractors, consultants and technocrats who carry out most of the work of producing, circulating, standardizing and regulating the new climate benefit units, conventional dualisms opposing "state" and "market" are of as little use in analysing official climate policy as they are in understanding other areas of neoliberal politics. As elsewhere in neoliberalism, the flip side of this expansion in the scope of state agency is a ritualistic or histrionic denial of its existence. The copious interventions of the neoliberal state to protect investor freedom are reinterpreted as, at most, mere caretaker moves safeguarding the integrity of a non-state "system", and are vigorously contrasted with the alleged blunt-force meddling of "command and control". Ecosystem services themselves are treated as if they had always been there, state or no state, awaiting merely the figurative flipping of the switch that would allow the profit motive to be enlisted in their behalf (e.g., Heal 2015).

Achieving a well-rounded understanding of the distinctiveness of neoliberalism's climate – and of

its continuity with previous capitalist climates – requires a standpoint of resistance. Putting in perspective neoliberalism's claim that it can provide an alternative, cheaper way of preserving and stabilizing a singular, timeless, nonhuman climate needed by all humanity entails listening to the indigenous, peasant, labour, feminist and commons movements with the experience to perceive the classism, racism and neocolonialism inherent in such construals of nature. At the same time, resistance can benefit from an extended historical understanding that can help pre-empt attempts to identify the development of nonextraction rents or commodities with the defence of commons: attempts to establish, for instance, that movements to keep oil in the soil in the Ecuadorian Amazon are really all about "caps" and "biospheric limits"; that Latin American indigenous practices of *sumak kawsay* or *buen vivir* amount to green developmentalism, natural resource management or "resilience"; that indigenous territories are instances of the abstract spaces co-devised by 16th-century European mapmakers or 21st century prophets of "natural capital"; or that Andean visions of *pachamama* is one of the externalized "natures" of capitalism, whose rights, it is implied, can only be defended by humans considered to be outside of it. The most penetrating inquiries into neoliberalism's climate, in short, are likely to be connected not just with efforts to "reculture" climate (Endfield 2011), but also with the formation and defense of radical political alliances and dialogues.

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