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# Governing through disorder: Neoliberal environmental governance and social theory

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## Abstract

Recent years have witnessed the spread of an array of market-inspired environmental governance approaches, often associated with neoliberal ideas, programs and policies. Drawing on the governmentality framework and focusing on the examples of biotechnology patenting and the financialisation of climate and weather, the article argues that the conceptual underpinnings of these approaches lie in a novel understanding of the ontological quality of the biophysical world. The latter is conceived as fully plastic, controllable, open to an ever-expanding human agency. Neoliberal governance operates through, rather than despite, disorder – that is, through contingency, uncertainty, instability. In the public realm this idea constitutes a sort of shared horizon of meaning; but environmental social theory has a difficult time accounting for it. By reviewing three major perspectives, namely ecological modernization, neo-Marxism and poststructuralism, it is shown that behind contradictions and reticence in their assessments of neoliberal governance lie difficulties in making sense of the latter's theoretical core. This sets a challenging research program for social theory.

**Keywords:** Neoliberalism; Ecological modernisation; Biotechnology; Carbon markets; Risk and uncertainty; Governmentality

## 1. Introduction

Ecological threats, technological and scientific advancement, and social change intertwine in an oblique way. The world in which, decades ago, the environment emerged as a public issue is profoundly different from the present one. The current state of global affairs conveys a widespread perception of disorder ([Sonnenfeld and Mol, 2011](#)). ‘Structures that had provided for some predictability are breaking down and a trend towards uncertainty and unpredictability is likely to characterize the present and foreseeable future’ ([Arrighi and Silver, 2001](#), p. 258). [Jessop \(2002\)](#) talks of a transition from ‘Keynesian welfare national states’ to ‘Schumpeterian workfare postnational regimes’. The first, developing in the post-WW2 decades, aimed at full employment and economic planning, prioritised social policies over economic development, centred policy-

making and implementation on the national scale, and grounded public choice on neo-corporatist models. The second, emerging since the mid-1970s, aim at increasing the competitiveness of national and local economies, focus on technological innovation, place economic development over social policies, centre policy-making and implementation at the supranational and local scale, and ground public choice on public–private partnerships and stakeholder consultations and negotiations. With regard to the natural environment, sustainability has replaced ‘limits to growth’ as a dominant theme, while market-based and contractualised policy approaches – taxes, incentives, ‘cap-and-trade’ arrangements, voluntary agreements, non-binding standards and rules – have gained growing relevance.

From fisheries quota systems to agricultural trade liberalisation, from water supply privatisation to the commodification of genetic resources, from carbon offset schemes to the sale of ecological services, there is ample evidence of a major shift in environmental governance. Such shift is often associated with neoliberal ideas, programs and policies. Neoliberalism is a complex and contested field of inquiry. This article advances two interconnected arguments about it. First, a distinctive and increasingly dominant neoliberal outlook on the biophysical world can be identified. Second, this outlook is inherently troublesome for environmental social theory, affecting the latter's understanding of ongoing changes in the relationship between society and nature.

Disorder is usually interpreted as the pathology of a transitional period, bound to result in a new order ([Arrighi and Silver, 2001](#)). However, at least regarding the interaction between humans and the environment, it is possible to argue that disorder – better: uncertainty, contingency, instability – has become a way of governing. And this is related to a redefinition of the ontological quality of the biophysical world. The next three sections elaborate on the neoliberal stance on the biophysical world. To clarify neoliberal rationality I draw on the governmentality approach, using biotechnology patenting and the financialisation of climate and weather as especially fitting examples. The subsequent sections turn to three major perspectives in environmental social theory: ecological modernisation, neo-Marxism and post-structuralism. Their engagement with neoliberalism differs to a remarkable extent. Behind contradictions and reticence, I argue, lies a commonality in that all three perspectives have difficulties in tackling the ontological core of the neoliberal approach to the biophysical world. The article concludes with reflections on some lines of further development in environmental social theory.

## 2. Neoliberalism and nature

In a relatively short time, a huge amount of literature has emerged on neoliberalism.<sup>1</sup> Neoliberalism is often portrayed as a project of social change, for which ‘human well-being can best be advanced by liberating individual entrepreneurial freedoms and skills within an institutional framework characterized by strong private property rights, free markets, and free trade. The role of the state is to create and preserve an institutional framework appropriate to such practices’ ([Harvey, 2005](#), p. 2). Central characteristics are thus rational, self-interested individuals and the market as the main regulative mechanism, while a lessened role is assigned to traditional politics ([Hay, 2007](#)).

Many scholars, it has to be remarked, stress that talking of encompassing, ‘hegemonic’, projects sounds like an overstatement. The reality which we are confronted with is rather a complex, contested, contradictory assemblage of policies, practices and discourses ([\[Ong, 2006\]](#) and [\[Birch and Mykhnenko, 2009\]](#)). There are different ‘waves’ of neoliberalization ([\[Brenner et al., 2010\]](#)). There are diverse ways of reacting – in terms of promoting, adjusting or resisting – to the ‘global neoliberal turn’ ([\[Jessop, 2002\]](#)). Yet the very recognition of world-wide thrusts and counter-thrusts, albeit spatially and temporally differentiated, conveys some sense of unity.

In this context, a growing (mostly, but not uniquely, neo-Marxist) scholarship has identified the ‘neoliberalization of nature’ ([\[McCarthy and Prudham, 2004\]](#) and [\[Castree, 2008\]](#)) as the increasing management of natural resources and environmental issues through market-oriented arrangements, by off-loading rights and responsibilities to private firms, civil society groups and individual citizens, with state power, in its national and transnational incarnations, providing the rules under which markets operate ([\[Bumpus and Liverman, 2008\]](#) and [\[Castree, 2008\]](#)). Sustaining growth in a market economy entails a ceaseless search for new products, techniques, markets and raw materials. In this sense neoliberalism and classic liberalism share a basic commitment to restructuring social relations with nature. The privatisation and commodification of land, forests and many other resources was justified by liberal thinkers by arguing that, since nature gains value through the application of human labour, conferring exclusive control of natural resources on those individuals who work them is both morally right and collectively beneficial. This is basically the same rationale used to advocate current market-based environmental policies. Yet, while in classical liberalism there was a sustained debate over the material limits to economic growth, the neoliberal discourse is dominated by Promethean accounts of technology and economic expansion, where the case for the limits to growth is reverted into a case for the growth of limits ([\[Lemke, 2003\]](#) and [\[McCarthy and Prudham, 2004\]](#)).

There is, thus, no total equivalence between the liberal and the neoliberal outlook on the biophysical world. It would be tempting to ascribe the difference to the amazing record of technoscientific achievements accumulated over recent decades. Such explanation, however, sounds unconvincing, not only because these achievements have been complemented with an equally astonishing record of disasters, but above all because the transformative capacity of human labour is central to classic liberalism and neoliberalism (and Marxism) alike. It is more likely that there exists a difference in the way nature is conceived. In contrast to liberalism, neoliberalism regards nature ‘no longer as an ultimate irreversible barrier [but as] a constraint that can be strategically manipulated’ ([Fuller, 2008](#), p. 2). This idea of a ‘constraint that can be strategically manipulated’ is worth elaborating.

### **3. Disorder and contingency in neoliberal governance**

For such an elaboration the governmentality approach looks promising. Foucault, who coined the governmentality concept, noticed that government is more than state power. It is ‘the ensemble formed by the institutions, procedures, analyses and reflections, the calculations and tactics’ ([Foucault, 1991](#), p. 102) that allow the exercise of a particular form of rule. Government includes a variety of practices, techniques and mentalities through which subjects are governed, in the sense of both being led to follow certain rules (subjection) and taking shape with respect to such rules (subjectification). It is this mentality or rationality of government that one has to understand to make sense of the ‘neoliberalisation of nature’.

For governmentality scholarship, the key feature of such mentality is ‘government at a distance’; its key actor is the responsible, enterprising, self-governing individual. Neoliberal governmentality does not refer, as the liberal one, to the ‘*natural*, private-interest-motivated conduct of free, market *exchanging* individuals [but] to *artificially* arranged or contrived forms of the free, *entrepreneurial* and *competitive* conduct of economic-rational individuals’ ([Burchell, 1996](#), pp. 23–24, italics original). On this view, ‘the regulation of conduct becomes a matter of each individual's desire to govern their own conduct freely in the service of the maximization of a version of their happiness and fulfilment that they take to be their own’ ([Rose, 1996](#), p. 57). Moreover, in order to promote competition, the market needs active regulation. If neoliberalism shares with classic liberalism a commitment to limiting state intervention in favour of individual choice in the market, the latter is no longer seen as the spontaneous expression of an anthropological propensity to exchange, as with Adam Smith; it must be purposefully crafted ([Lazzarato, 2009](#)).

All this entails a profoundly different conception of the relationship between action and the world, thus of risk and uncertainty. ‘The way in which risk is built into governmental practices [varies] under differing governing conditions – specifically, in relation to differing political rationalities [...] Differing approaches to risk *give shape to* different forms of liberalism’ (O’Malley, 2008, p. 69, italics original). The liberal view of freedom, rationality and responsibility entails a future neither totally fixed nor totally random. On the one hand, risk means a future event related to behavioural choices, the probability of which is amenable to calculation (Luhmann, 1993). On the other, profit stems from those ‘unpredictable risks’, as related for example to innovation, which no insurance company will cover, nor any investment programme can calculate.<sup>2</sup> So on the one hand, through calculability it is possible ‘to transform a radically indeterminate cosmos into a manageable one’ (Reddy, 1996, p. 237). On the other, non-calculable uncertainty prevents humans from being prisoners of an inevitable path: ‘we create the future in innovative ways and escape the bonds of a statistically knowable future’ (O’Malley, 2008, p. 73). Moreover, the reference of risk to behavioural choices entails that the difference tends to vanish between states of the world independent of any observer concerning stochastic laws of chance processes and cognitive states concerning degrees of belief in propositions. Bayesian theories of subjective probability actually refer all probabilities to the agent's knowledge, ‘because relative frequencies are only sample data of past events that influence subjective probabilities of future events’ (Stewart, 2000, p. 42).

This understanding of risk and uncertainty stands in stark contrast with a perspective gaining salience in the environmental sciences since the 1970s, which pinpoints complexity as the crucial feature of natural and social systems and their interactions.<sup>3</sup> For von Neumann, one of the founding fathers of complexity theory, an object of inquiry is complex when its structure is simpler than the description of its properties, which means that the only way to know how it works is to run it and see what happens (Dupuy and Grinbaum, 2004). Complex systems are therefore intrinsically unpredictable. ‘Disorder’, in the sense of instability and uncontrollability, defines their ontological status. There is a permanent gap between biophysical processes like climate change or the spread of genetically modified organisms (GMOs) in the open environment and our calculated intervention on them ([Wynne, 1992] and [Funtowicz and Ravetz, 1993]).

What the governmentality literature shows, then, is that in its account of the interaction between humans and the world, neoliberalism departs from both liberal and complexity perspectives. The basic conceptual move lies in a stretching of the subjective approach to uncertainty – the way uncertainty ‘makes free’. The entrepreneur is depicted as possessing

the responsibility and skills for managing and creating not merely wealth but the future. [...] An extensive and immensely influential managerial literature appearing since the early 1980s [...] celebrates uncertainty as the technique of entrepreneurial creativity, [...] the fluid art of the possible. It involves techniques of flexibility and adaptability, requires a certain kind of ‘vision’ that may be thought of as intuition but is nevertheless capable of being explicated at great length in terms such as ‘anticipatory government’ and ‘government with foresight’ (O’Malley, 2004, pp. 3–5).

Uncertainty, thus, is seen no more as a circumscribed situation on which to build a few strategic decisions, but as an empowering everyday condition. Entrepreneurial agency is located within the artificially arranged, ever-changing task environment produced by global trade, innovation-based competition and the financial turbulence created by floating exchange rates. This affects how contingency is accounted for. Indeterminacy, one could say, does not mean constraining *non-determinability*, but enabling *non-determination*. While in the first case the causal chains are regarded as open in the sense that the events can take unpredictable turns because of unknown intervening variables, emergent systems properties and so on, in the second case the causal chains

are regarded as open in the sense that the agent does not find them predetermined, but can handle and orient them in the desired direction. Contingency means lack of limits rather than lack of order. Better: disorder, as a positive, enabling systems condition, can be handled by carving out provisional room for purposeful manoeuvre. The more unstable the world, the more manageable.

Entrepreneurial agents, of course, do not just close their eyes and jump. Rather, they estimate ‘the future in much the same way that people do engaging in extreme sports: that is by accumulating information, relying on experience, using practiced judgment and rules of thumb, and so on’ (O’Malley, 2008, p. 73). This is reflected in the growing use of scenario techniques (Cooper, 2010). Scenarios are not proper forecasts but alternative images of the future, where likelihoods of occurrence are replaced by degrees of confidence. Scenarios seek to identify discontinuities, possible surprises, effects of unknowable events, and so on. Their goal is to prepare for the unexpected. They construct possible worlds on the idea that imagination and belief have a creative, and not just descriptive, force. Radical contingency, rather than risk, is their target and resource.

The basic orientation of neoliberalism, thus, is speculative, rather than predictive: proper calculations of risk are seen as an exception, while reasoned bets over unpredictable futures are regarded as the rule. Rather than paralysing, the eventuality of future, or the subjectivity of expectations, enables the construction of purposefully designed task environments where new opportunities take shape. The fundamental difference between the liberal and the neoliberal entrepreneurial agent, therefore, is not only that the latter corresponds to the citizen or the human being as such, but that this entrepreneur operates within an artificially crafted world. Abstraction is the key to this creative capacity.

Abstraction is a long-noticed feature of capitalism. For Polanyi (1944) free market capitalism treats many elements of nature, such as water or trees, as ‘fictitious commodities’, that is marketisable resources disembedded from their socio-cultural meaning and biophysical function. Being a quantitative and impersonal way to express things, use values and needs, capital abstracts the real world, transforming itself into increasingly abstract forms, as the dematerialization of money testifies. Abstraction translates differences into exchangeable equivalences, which means giving disorder or contingency an ordered, manageable form.

Since its beginning, the neoliberal era has been characterized by processes of intensive abstraction.<sup>4</sup> Such work is qualitatively different from previous capitalist performances, in that it operates at an ontological, rather than epistemic, level. This point is crucial and is developed in the next section, drawing on the examples of biotechnology patents and the financialisation of climate and weather.

#### **4. Biotechnology patents and the financialisation of climate and weather**

The basic justification for biotechnology patents is straightforward. Innovation is beneficial to the whole society and patents are the best way to promote and spread it, since they encourage investment in research and make its results publicly available. The enduring question of patenting is the distinction between discovery and invention. The requirements for patentability differ to some extent from place to place. In the US a patent must be novel (not previously made public), non-obvious (to someone ‘skilled in the art’) and useful; in Europe a patent must be novel, constitute an inventive step and demonstrate industrial applicability (Calvert, 2007). Though legally relevant, these differences do not affect the underlying logic of the patenting of biotechnology, which may be synthesized as follows: (a) a mechanistic conception of the world: both organic and inorganic matter are assemblies of parts; (b) isolation and purification as criteria for distinguishing what is manufactured from what is not (in other words, making things usable counts more than whether such things already exist in nature in some form); (c) dematerialization of physical matter into its



informational contents, that is pure function; and (d) presumption of manufacture by virtue of the very demand of a patent (it is the task of the denying authority to prove that something ‘exists in nature’). So, for example, a product patent for a genetic sequence entails regarding it as a ‘composition of matter’, novel in that in its isolated and purified form it is not available in nature, and the ‘utility’ or ‘industrial applicability’ of which lies in the disclosure of its function. Such disclosure basically corresponds to understanding the biochemistry of the protein a gene produces and how this leads to a specific trait of the organism.<sup>5</sup> Therefore genes are regarded as carriers of information, suitable for translation into different media (Kay, 1999). Though information as such, like ideas, scientific theories or laws of nature, is excluded from patenting, the demonstration of some technical effect or functionality allows for property rights claims. In the end,

the gene has an ambiguous status where it is simultaneously thought of as both a material entity and a carrier of information. [...] This duality of the genome is exploited in patenting, where a slippage has occurred between patenting the material DNA, disclosing the sequence, and patenting the genomic information, in computer or other media (Calvert, 2007, p. 215).

On the one hand, therefore, any difference between living and non-living entities is erased. On the other, a living entity is considered an artefact if its basic functional parameters can be controlled, thus reproduced, and a correspondence is implicitly established between matter and information, so that rights in property over information can be subsumed into rights in property over the organisms incorporating such information, and vice versa. This ontological ambiguity or oscillation translates into actual court rulings when, as with the *Monsanto Canada Inc. v. Percy Schmeiser* case (2004), patents are recognized to cover genes provided with specific capacities (in this case, resistance to the Roundup™ herbicide), yet at the same time also cover the whole organisms where such rights in property reside (in this case, the Roundup Ready™ canola plants) (Carolan, 2010).

With biotech patents, one may say, discovery becomes a residual, shrinking category, in front of the expanding space of invention. Nature is what provisionally belongs to the ill-clarified, non-domesticated world lying beyond the boundaries of commodification, as set by commodity producers. Nature and manufacture become distinctions internal to the manufacturing process (Pellizzoni, 2010). The object of property oscillates between material and information. Biotechnology patents are ‘fluid objects’ (Carolan, 2010); their ontological identity ‘flows and gently changes shape, bit by bit’ (Law and Singleton, 2005, p. 338). This fluidity is doubled by the ‘substantial equivalence’ argument central to commercial applications, by which, for any practical purpose, patented artefacts are indistinguishable from nature, thus they do not require any specific regulation. Artefacts are thus simultaneously identical to and different (more usable, more valuable) than natural entities.

Equivalence of difference; difference of equivalence. The ontological fluidity of nature and culture and of the living and nonliving world transforms virtually everything into a commodity-in-the-making. The same way that complexities and ambivalences can be translated into manageable contingencies can be found in the financialisation of climate and weather.

Carbon markets commodify climate regulation by assigning highly speculative capacities to allegedly equivalent (thus valuable according to their cost effectiveness and tradable) emission cuts. For example, a factory in China that produces chlorodifluoromethane (HCFC-22), a substance mainly used as a refrigerant, can earn CER (Certified Emission Reduction) credits under the Clean Development Mechanism (CDM) of the Kyoto protocol by installing an incinerator furnace capable of decomposing trifluoromethane (HFC-23) – a by-product of HCFC-22 and a greenhouse gas – and showing that in this way it cuts its emission below a baseline level (the minimum achievable without using the incinerator). With the EU's Emission Trading Scheme (ETS), then, these CER

credits can be transformed into emission permits for an oil power plant in a European country. ‘By decomposing a tonne of HFC-23 in China one can – via the link between the CDM and ETS – earn allowances to emit 11,700 tonnes of CO<sub>2</sub> in Europe’ ([MacKenzie, 2009](#), p. 445). The 11,700 multiplier corresponds to the global warming potential’ (GWP) of HFC-23 established by the International Panel on Climate Change (IPCC). Behind this figure lie considerable processes of abstraction and speculation. The comparison of the GWP of CO<sub>2</sub> and HFC-23, respectively, is based on an estimate of their atmospheric effects according to mathematical models and the conventional fixing of a 100-year period; an estimate which is theoretically debatable and empirically surrounded by significant uncertainties.<sup>6</sup> Yet the figure works as a black box and is accepted in carbon markets as exchange rate. In this way the intractable complexity of the real impact of different quantities of diverse gases emitted in opposite parts of the world at different times is transformed into a matter of calculation.

The potentials for profit offered by CDM-ETS and other mechanisms are huge for those who find themselves in the ‘right’ geographical, technological and cognitive place (high levels of pollution in 1990, for example, or easily achieved efficiencies, or the professional capacities related to verification, insurance and finance). Yet it is important to reflect on what these mechanisms imply. On the one hand, carbon markets are completely constructed task environments, heavily dependent on the intervention and authoritativeness of political, economic and scientific institutions. On the other, what look like calculations are highly speculative evaluations, not only of underlying biophysical processes, but also of the stability and evolution of these markets and their supporting institutions and regulations.

This combination of artificiality and speculation is even more evident with ‘weather derivatives’. These are products designed to hedge and trade securities contingent on unpredictable states of weather, either catastrophic or not. The level, timing and swings of temperature, rain or wind, for example, may affect a number of enterprises, from energy companies to food producers. Investors, then, make their choice as to whether or not to take ‘risks’ in subjective terms, that is according to degrees of trust and beliefs ([Cooper, 2010](#)). The price assigned to the future depends on the expectations of all traders. Derivatives, thus, ‘turn the contestability of fundamental value into a tradable commodity. In so doing, they provide a market benchmark for an unknowable value’ ([Bryan and Rafferty, 2006](#), p. 37). Similar to carbon markets (which have their own derivatives as well), physical turbulences and incommensurabilities are translated from puzzling problems into enabling opportunities.

What is important to stress, then, is that the logic underlying so different fields as biotechnology patenting and climate-weather financial markets is the same. Complexities and uncertainties are rendered tractable, first of all by redefining the ontology of biophysical matter. The latter is not simply decomposed and recomposed via abstraction, but conceived as intrinsically unstable or ambivalent. Genes, carbon and rain oscillate between difference and equivalence, materiality and virtuality, substance and information. In this, we are not confronted with a simple reproduction of the venerable capitalist strategy of creating fictitious commodities. This latter strategy works at an epistemic level. The ‘neoliberalization of nature’ works, instead, at an ontological level. There is more than an ‘as if’ at stake here: there is the actual crafting of entities that did not exist beforehand, like the patented gene with its organic-informational ambivalence or the variably embodied GWP. There is nothing fictitious in these commodities: they *are* commodities, their ‘reality’ is nothing else than this.

This point requires attention. [Carolan \(2008\)](#) suggests that the ontological instability of patents seeks to protect and reproduce what [Latour \(1993\)](#) and many scholars in science and technology studies regard as a fictitious divide between nature and culture, object and observation; it seeks to

hide and deny the presence of hybrid entities, by keeping the threshold between the two realms open to ad hoc redefinitions. However, at a closer look, biotechnology patents, CERs and weather derivatives do not seem to hide at all, but rather to assert the ontological indefiniteness of their biophysical referents – nor do experts working in these fields look unaware of, or unwilling to admit, this ([\[Calvert, 2007\]](#) and [\[MacKenzie, 2009\]](#)). Neoliberal governance, thus, seems to entail a subtle and novel conceptual move. One pillar of modernity is abandoned: the core distinction between inner and outer worlds disappears in favour of what, to all intents and purposes, is an anti-essentialist ontology. At the same time, another pillar of modernity, traditionally linked to the idea of objective knowledge, is reaffirmed and expanded in scope: human agency as having capacity of control. Such agency finds no limits since it includes the manufacturing of its own task environments. For this hypertrophic agency any outside (nature) is just functional to distinguishing within the inside (manufacture); it becomes an element of endless and ever changeable internal differentiations, as the controversies over the object of patents or the intricacies of carbon markets and weather derivatives testify. Neoliberal governance is not afraid of but feeds itself with contingency.

## 5. Neoliberalism and environmental social theory

It is at the ontological level, then, in a peculiar combination of tradition and innovation regarding the way the human agent and her operational field are conceived, that one can find the ideational core of the ‘neoliberalisation of nature’. This core is relevant, in turn, to the confrontation of environmental social theory with neoliberal environmental governance; this may be illustrated through an exploration of three theoretical perspectives from the environmental social sciences: ecological modernisation, neo-Marxism and post-structuralism.<sup>7</sup>

Neoliberalism does not feature prominently in the ecological modernisation (EM) literature. When it is mentioned, efforts are made to avoid conflation, which is indeed rather easy. EM maintains that economic growth and industrial development can be accommodated to environmental sustainability. Market capitalism can be redirected and transformed ‘in such a way that it less and less obstructs, and increasingly contributes to, the preservation of society's sustenance base’ ([\[Mol and Jänicke, 2009\]](#), p. 24). This corresponds, to a remarkable extent, to policy instruments and styles that scholars often depict as neoliberal: technological innovation and institutional change focused on decentring, networking, adopting market-based and voluntary policy instruments, promoting corporate and consumer responsible self-regulation ([\[Mol and Sonnenfeld, 2002\]](#)). Much, then, must depend on how such instruments and styles are applied. Mol, for example, stresses that answering today's environmental problems and challenges entails rejecting neoliberal solutions, without embracing anti-globalization and state-centred strategies. Democratic designs for global (including environmental) governance and global civil society are the best means for controlling unrestrained competition and neoliberal policies. Rather than refusing globalization, therefore, the task is attacking ‘certain elements or forms of a globalizing world while strengthening others’ ([\[Mol, 2001\]](#), p. 10): for example expanding the arenas for public reasoning and consultation of citizens and NGOs.

There is little resemblance between arguments that EM scholars largely subscribe, such as the idea of an ‘ecological citizenship’ based on non-reciprocal, non-contractual, non-territorial obligations of justice, care and compassion ([\[Dobson, 2003\]](#) and [\[Spaargaren, 2011\]](#)) or the case for urgently addressing world inequalities simultaneously affected by social and natural factors ([\[Beck, 2010\]](#)), and the neoliberal stress on inequality as the engine of competition on which social growth depends ([\[Lazzarato, 2009\]](#)), or its account of citizenship as modelled on the self-reliant, self-managing individual owner ideal ([\[Ong, 2006\]](#)). Yet, in concrete, the extent to which EM approaches can be distinguished from ‘soft’ varieties of neoliberal policy adjustment remains unclear. Consider, for



example, those which [Jessop \(2002\)](#) calls 'neostatist' and 'neocommunitarian'. The former give relevance to regulated competition, public-private partnerships under state guidance, auditing performances, protection of core economy; the latter valorise fair trade, social cohesion, third sector expansion and local governance. These elements, variously combined, are typically included in the recipe for environmental reform proposed by EM scholars.

Neo-Marxists are highly sceptical about the possibility of effective environmental reform of contemporary market societies. This scholarship reads ecological problems in the light of the capacity of capitalism to displace its built-in imbalances across space and time. Today, it is argued, there exists not simply a renewed accumulation process, but a qualitatively distinct one. This becomes apparent when Marx's notions of 'formal' and 'real' subsumption of labour are applied to nature. Formal subsumption occurs when capital exploits natural resources according to their features, as with mineral extraction and traditional fishery. Real subsumption occurs when industries alter the properties of nature, increasing or intensifying its productivity and consequently enhancing capital accumulation. The present prominence of biotechnologies suggests that real subsumption is increasingly getting at the core of capitalism ([Boyd et al., 2001](#)). Moreover, Current environmental policies are often read by neo-Marxists according to Polanyi's notion of 'double movement': that is, as counteractions aimed at limiting the socially and environmentally disruptive effects of self-regulating market capitalism. This is interpreted as a way to protect capital and expand opportunities for profits, while offering a 'discursive and material response to public concern and pressure for regulation' ([Bumpus and Liverman, 2008](#), p. 131).

Despite the commonality of analytical frameworks, however, neo-Marxists disagree on a major point. If environmental concerns are regarded as a major source of political opposition ([McCarthy and Prudham, 2004](#)), what such opposition does or should consist of is not clear. For example, [Hardt and Negri \(2004\)](#) or [Virno \(2009\)](#) believe that political identities, institutions and processes are losing relevance in favour of civil society groups and the flourishing of ad hoc, ethically minded mobilizations, such as critical consumerism and product boycotts. On the contrary, for [Harvey \(2005\)](#) or [Mouffe \(2005\)](#), traditional politics and the state as a sovereign regulatory and military entity have lost none of their relevance, requiring commensurate counter-forces, while the growing involvement of NGOs as policy advisors or delegates 'on behalf of' the citizens is suspect, being in line with the neoliberal privatising and depoliticizing aims. For some even Open Source informational networks can be a vehicle for control and subjugation ([Suarez-Villa, 2009](#)).

Post-structuralism in the social sciences includes a number of interlinked literatures, the common trait of which is a commitment to deconstructing the modern ontology of the subject, as a full-fledged self having cognitive access to, and agency on, an objectively given world. The governmentality approach represents a prominent example. One might expect, again, that commonality of analytical perspective would entail commonality of evaluative attitudes, yet again this is hardly the case. Nowhere does this appear more clearly than in the way biotechnology policies are assessed. For some poststructuralists, gene technologies are individually empowering, producing 'an innovative new ethics of biological citizenship and genetic responsibility' ([Rose, 2007](#), p. 39), expanding the opportunities for choice, prudence and sociality, self-actualization and enterprising, 'improvement' or 'correction' of body and mind vis-à-vis some ideal. Others, instead, maintain that geneticisation redirects scarce resources away from social solutions to social problems, transforming the latter in questions of self-care. These scholars also argue that genetic research, screening and testing extends disciplinary powers, and that experts, institutions and social norms frame the cognitive and moral conditions in which individuals make their choices ([Lemke, 2004](#) and [Raman and Tutton, 2010](#)). In other words, then, if governmentality implies at the same time processes of subjectification and subjection, some scholars emphasise the former and others the latter, and the case for an expanding ethical selfhood clashes with the case against a shrinking

political agency. The line of division largely runs between those whose interest in developing the Foucauldian approach lies, to a major extent, in its capacity to sidestep the limits of neo-Marxism, and especially structural Marxism ([Miller and Rose, 2008](#)), and those who instead combine Marxist and Foucauldian insights, with explicit aims of social criticism.

Other examples of post-structuralist approaches relevant to our argument can be found in the field of science and technology studies. Here again the confrontation with neoliberalism leads to diverging replies. The clearest evidence is perhaps offered by studies on carbon markets. Drawing on actor-network theory, Michel Callon and associates have made a strong case for analysing markets from the viewpoint of the ‘performativity of economics’: the idea that economics ‘performs, shapes and formats the economy, rather than observing how it functions’ ([Callon, 1998](#), p. 2). Markets are a matter of design and construction – selecting what is to be taken in consideration (‘internalities’) and leaving outside all the rest (‘externalities’). The basic goal of markets is ‘formatting’ the networks that connect human agents with each other and with non-human entities in such a way that calculation, that is the establishment of relations of equivalence, is made possible. From this viewpoint, carbon markets offer an excellent field of inquiry, in that they are built up from scratch based on economic theories, but in an experimental way through the ‘constitution of collectives comprising large numbers of different actors from diverse temporal and spatial horizons’ ([Callon, 2009](#), p. 538). Starkly different evaluations, however, are developed by adopting this analytical perspective. [MacKenzie \(2009\)](#), for example, finds no realistic alternative to carbon markets. By contrast, for Lohmann, ‘political activists, physical scientists and technocrats alike have been captured and constrained by “free market” ideology’ ([2005, p. 230](#)) as carbon markets exacerbate global inequalities and negatively affect climate change mitigation ([Lohmann, 2009](#)). Callon, in his turn, takes a prospectively optimistic standpoint: the constructed character of markets leaves room for change and adjustment. ‘The challenge of climate change could be one of the first opportunities on a planetary scale to raise the question of how to better civilize markets, [that is] transform unsolvable issues into solvable problems’ ([Callon, 2009](#), p. 547).

## 6. Ontological questions

As one can see, clarity and consistency feature inconspicuously in environmental social theory perspectives on neoliberalism. EM has trouble distancing itself from neoliberal styles of governance. Neo-Marxism is unsure whether counter-forces to neoliberalism can find any space outside and beyond traditional politics. Poststructuralists may be illuminating on the neoliberal way of governing, but reach divergent evaluations of the latter's effects. One might say that current changes resist simplified (or simplistic) judgements, and that a variety of opinions is sign of intellectual liveliness. There are, however, theoretical difficulties in tackling the ontological core of the ‘neoliberalisation of nature’, which may help make sense of this somewhat problematic picture.

The neoliberal approach to nature can be condensed in a reconfiguration of the biophysical world as not fictionally but actually plastic. The ontological, rather than epistemic, fluidity of nature entails an increase in its manipulability and controllability, since the limits of the world as manufactured represent also its limits of meaning and salience. World-making deploys its own contingency, much in the same way as a big-bang universe deploys its material contents together with its time and space frame. Actually, the neoliberal entrepreneurial agent looks similar to a god, since the full pliancy of materiality to human designs leads to depicting agency in terms of an ultimately unconstrained will. A marked step in this direction is represented by the recent, influential narrative of a potentially unlimited ‘human enhancement’ through a synergistic combination of nano-bio-info-cognitive technosciences allegedly bound to revolutionise not only industrial productivity but also and above all human biological and mental capacities ([\[Roco and Bainbridge, 2002\]](#) and

[\[Nordmann, 2004\]](#)). This ontology is troublesome for all the three theoretical perspectives considered.

The ontological underpinnings of ecological modernisation theory are straightforward: nature and society are seen as interacting but distinct realms. The original, more ‘technocratic’ ([Spaargaren et al., 2009](#)) outlook of EM, which most evidently implied this perspective, has been gradually tempered by incorporating aspects of actor-network theory and Beck's theory of risk and reflexive modernisation. Increasing concerns for environmental flows (of energy, water, biodiversity, waste, green products, etc.) and production-consumption practices have led various scholars to conceive the natural and the socio-technical dimensions as merging into a material world that impinges on human agency. Such hybrid networks, however, are mostly described in terms of ‘mixed’ ontologies, that is by presupposing traditional distinctions between what pertains to nature and what pertains to society ([\[Spaargaren et al., 2006\]](#) and [\[Spaargaren, 2009\]](#)).<sup>8</sup> As for Beck, he highlights the connection between discursive constructions and materiality of threats. Human appraisal of risks, often incalculable yet corresponding to actual events and phenomena, is mediated by knowledge, perception, value commitments, and social organization. This means that the intertwining of materiality and construction is located at an epistemic level, with reference to the limits of human cognitive access to reality. The ontological separation of environment and society, nature and artefact, is not questioned ([\[Beck, 1992\]](#) and [\[Beck, 2009\]](#)).<sup>9</sup> By contrast, as we have seen, neoliberalism regards uncertainty as crafted in a ‘thicker’ sense. Uncertainty does not depend on human interventions on materiality, but on the extension of human capacity to manufacture the latter, to build it while appraising it, to give shape to the contingency one is confronted with. Uncertainty, therefore, is amenable to a treatment which is still calculative, albeit not in the same way as it used to be. Contrary to Beck, reflexivity does not mean self-questioning and amending in front of the interpellations of an unassailable world, but self-assertion in the moulding of such world. The examples of biotechnology patenting and carbon markets are telling in this respect.

In short, there is a basic discord between neoliberal and EM ontologies. This discord accounts for the ambiguous implications (contrasting or supportive of neoliberalisation) of the environmental reforms advocated by EM scholars. In turn such ambiguity may be regarded as a reason for the latter's reluctance to engage in a close confrontation with neoliberalism.

In line with Marx's vision of nature as the ‘inorganic body’ to which humans are inextricably tied, neo-Marxists regard all biophysical barriers and opportunities as mediated by culture and technology ([Benton, 1989](#)). Through their metabolic interaction with nature, humans change the latter and change themselves, producing ‘new kinds of social relations and new kinds of persons’ ([Dickens, 2004](#), p. 62). Yet this transformative capacity is not seen as unlimited. Natural entities have their own reality and play an active role in human history. This view is insistently portrayed in recent literature. Nature is described as ‘recalcitrant’, capable of resisting ‘its incorporation into particular political-economic and spatial forms, to shape or reconfigure [in unpredictable ways] the landscape of capitalism’ ([Braun, 2008](#), pp. 668–669). Moreover, and crucially, humans cannot entirely transform their *own* nature. Some core agential and biological elements remain unchanged. This stability is related to Marx's notion of labour as the distinguishing feature of humans, from which their operational ability depends. On the one hand, economic agency, as the transformative capacity that represents the condition of possibility of society, is logically premised on neo-Marxist analyses.<sup>10</sup> On the other hand, the neoliberalisation of nature is seen to draw also, and first of all, on a human ‘biological invariant’: the dearth of specialized instincts, the lack of a definite environment and the capacity of language, of symbolic communication. A flourishing literature on immaterial labour, bioeconomy and cognitive capitalism ([\[Lazzarato, 2004\]](#), [\[Fumagalli, 2007\]](#) and [\[Cooper, 2008\]](#)) stresses that the most noteworthy resources today are ‘the biological prerogatives of the human animal: [...] the habit not to acquire lasting habits, that is the capacity to react promptly to

the unusual' ([Virno, 2009](#), pp. 100–101). The hallmark of current capitalism is the exploitation of creativity ([Suarez-Villa, 2009](#)).

What remains mostly unacknowledged, however, is that, if real subsumption of nature lies at the core of the neoliberal appropriative gesture, human biological ontology is involved in this process first and foremost. Accumulation does not build so much on a 'biological invariant', but regards the features of the species as a mere template open to modification and 'enhancement'. Subsumption of human nature is also real, and not just formal. So it may be that capitalist organizations, which appropriate creativity by compartmentalising and systematising it, cannot reproduce the latter on their own 'because of the fundamentally social character of this resource' ([Suarez-Villa, 2009](#), p. 15) – a character that includes formal and informal knowledge and languages, imagination, mentalities, identities, ethical views, and the technical and material means that shape and convey symbolic flows. Yet compartmentalisation and systematisation are unlikely to impinge only on corporate-led creative processes. If creativity is affected by, or a matter of, social context, then shaping and influencing such context, its horizons of meaning, is arguably the primary target of a 'government at a distance' the limits of which are hard to assess. Moreover, locating the fundamentals of human agency in the economic sphere implies an involuntary but substantial alignment with the neoliberal case for a human agency absorbed in, or reduced to, its entrepreneurial capacities.

The consequences of these problems surface in the controversy over neoliberal counterforces, hinted above. If the traditional links between economic articulation and political representation lose grip, and if neoliberalism is capable of subsuming under its logic every aspect of humanity, then it is hard and perhaps pointless to adjudicate which, between conventional political mobilisations and civil society ethical effervescence, constitutes the most effective oppositional instrument.

Environmental post-structuralism is at the same time profoundly consonant and dissonant with neoliberal ontology. The governmentality approach shows a 'radical historicist lean towards a nominalist conception of actions and practices, [where] anthropological universals appear as historical constructs with no fixed contents' ([Bevir, 2010](#), p. 427). Risks are described as not 'intrinsically real, but a particular way in which problems are viewed or "imagined" and dealt with' ([O'Malley, 2008](#), p. 57); a technology of government aimed at individuals' (self-)monitoring and (self-)control 'in the service of specific ends and with definite, but to some extent unforeseen, effects' ([Dean, 1999](#), p. 178). Nature is portrayed as 'a product of deliberate intervention, [...] a locus of artificiality, an object produced by humans' ([Gibbon and Novas, 2008](#), p. 4). This plasticity includes human nature, in both its agential and biological inflections: norms of responsible personhood, enterprising and self-actualising affect and bond together personal identity and biological identity, leading to 'the *creation* of subjects' ([Novas and Rose, 2000](#), p. 489, italics original) in a full, encompassing sense. Similar anti-essentialist accounts are provided by scholars in the science and technology studies tradition, where fluidity, contamination, inventiveness, instability, performativity and comparable notions are common parlance (e.g. [[Szerszynski et al., 2003](#)] and [[Braun, 2008](#)]). 'Knowing, the words of knowing, and texts do not describe a pre-existing world [but] are part of a practice of handling, intervening in, the world and thereby of enacting one of its versions – up to bringing it into being' ([Mol and Law, 2006](#), p. 19). On this view the world takes shape and meaning, emerging from an indistinctiveness that constitutes the (moveable) border of thinkability, only together with the cognitive act, and this act is inseparable from history and flesh. Objects come into existence together with the discursive formations that make it possible to talk about them. The world, and we who act upon it, are ontologically plastic, as the notion of the 'performativity of economics' perfectly synthesizes. Object and subject, nature and culture are contingent stabilizations of 'networks of mutually aligned materialities, subjectivities and knowledge-practices, not their given priors' ([Wynne, 2005](#), p. 69).



This idea of a making-sense-of-the-world that overlaps with world-making looks fully aligned with neoliberal ontology. This is probably not by chance. In their analysis of the ‘new spirit of capitalism’, [Boltanski and Chiapello \(2005\)](#) argue that the latter has been able to integrate the criticisms that intellectuals and social movements had raised between the 1960s and 1970s, using such criticisms as a way to reorganize itself and expand. Often developed in terms of an artistic critique where nature represented a fundamental site of authenticity and aesthetic value, counter-discourses took issue with the Fordist mode of production (bureaucratic, hierarchical, planned, standardized, alienating) in the name of freedom, autonomy and creativity. Translated into flexibility, networking, communication, and permanent education, these are indeed the qualities that post-Fordism valorises, while the authenticity and aesthetic worth of nature are transferred to the spheres of green consumerism and corporate responsibility.

The consequence of the alignment of the poststructuralist and neoliberal cases for world fluidity, contingency, ambivalence can be observed in the clash of evaluations of carbon markets and gene technologies, as hinted at above. Such discord points to the difficult, ultimately idiosyncratic, adjudication of whether nature and its significance can be integrally transferred to the ‘flexible paradise of neo-liberalism’ ([Lemke, 2003](#), p. 64), or the world retains an irreducible surplus or overhang in its material and symbolic scope. Alignment, for sure, does not mean overlap. If everything is intimately related, poststructuralists typically argue, human agency has a limited reach and everything is to be treated carefully, respectfully. If everything is invented, the neoliberal reply goes, everything can be redefined, commodified and appropriated. On the one hand, world-making means affecting and being affected; on the other, it means building, crafting, and manufacturing. On the one hand, nature is inventive and recalcitrant, on the other it is fully pliant. Yet the differences are subtle and hard to articulate using the same conceptual categories. Uncomfortable that this may sound to many scholars in governmentality and science and technology studies, neoliberalism and poststructuralism inhabit the same cultural fold of modernity, which makes their critique intrinsically problematic.

## **7. Conclusion**

This article started out with two aims: first, to identify at the deepest, ontological, level the underpinnings of widespread environmental policy approaches often associated with neoliberalism. Second, to show that different socio-environmental theoretical perspectives have had difficulty confronting these underpinnings, which affects their capacity to interpret the latter's implications for the governance of the biophysical world.

Neoliberalism draws on established traditions in political liberalism and market capitalism, yet is characterized by a novel understanding of the ontological quality of nature. ‘Nature’ is no longer conceived as an objectively given, though cognitively mediated, reality, but as a constitutively fluid entity, a contingency purposefully produced and controlled for instrumental ends. Governance through uncertainty, instability or ‘disorder’ thus seems to be the distinguishing feature of the ‘neoliberalisation of nature’. This ideational core may be considered the first reason for the sense of unity often felt when contemplating the array of sectors, approaches and cases characterizing current market-oriented environmental governance, and at the same time for the sense of uneasiness towards neoliberalism that environmental social theory conveys.

Whatever the judgment, it is important to grasp what is at stake with neoliberal governance of nature. Browsing social science books and journals, one realizes that much critical energy has been focused on questioning the objectivist account of nature that allegedly dominates current policy narratives and practices. Only a discerning scholarship has begun to realize that objectivism and anti-objectivism are losing relevance as categories capable of distinguishing intellectual and



stakeholder positions, and that they increasingly become claims usable in power games over the biophysical world. Attention, for example, has been recently paid to the instrumental use of uncertainty ([Freudenburg et al., 2008] and [Jacques et al., 2008]), which, depending on the circumstances, is used either to ask for policy-making (as with GMOs) or to call for policy-avoiding (as with ‘unwarranted’ restrictive measures related to climate change). The very possibility of appealing to ‘sound science’ either for evidence of no problems, or no evidence of problems indicates the fundamentally anti-objectivist attitude that characterizes present political and cultural frameworks. Policy promoters share this attitude with their opponents. Those who ask for ‘precaution’ use the same arguments in reverse, requiring action when and where there is no evidence of no problems.<sup>11</sup> This commonality entails that appeals to uncertainty are devoid of any strategic relevance in current controversies; rather, they play a tactical role. This is likely to represent a problem above all for counter-forces to neoliberalism, to the extent that in a tactical struggle the most advantaged are those provided with greater organizational, economic, cognitive and legal resources (to say nothing of military ones).

In short, we are today in front of a refashioning of the symbolic order of society vis-à-vis its biophysical underpinnings. In this change, neoliberal discourses, policies and practices are at the same time a powerful driver and a result. Disorder becomes order to the extent that uncertainty, contingency and instability are regarded not as disabling by-products of governance but as enabling ways of governing. In the public realm, this ends up constituting a sort of shared horizon of meaning: not only is no new ‘order’ (in the traditional sense) in sight, but anti-essentialism overflows from intellectual *avant-gardes* to become a widespread, albeit often implicit or negotiable, worldview.

This sets a challenging research program for social theory. Neither of the three frameworks discussed above seems fully capable of making sense of current trends in neoliberal environmental governance. Still essentially faithful to a traditional ontology, ecological modernisation perspectives advocate market- and innovation-oriented reforms, yet find problems in dealing with the ambivalent implications of such reforms. Neo-Marxism makes a strong case against a further submission of nature to the exploitative logic of capitalism, yet the scope of the latter's understanding of human transformative and self-transformative capacity remains basically unacknowledged. Post-structuralism may offer an enlightening access to the neoliberal ontology of the biophysical world, yet accounting for the latter's radical but selective anti-essentialism proves troublesome for both governmentality and science and technology studies scholars.

The necessary point of departure for renewed socio-environmental theoretical elaborations, I believe, is the hyper-modernist, post-calculative, disembodied, entrepreneurial agent that represents the theoretical engine of neoliberalism and the primary responsible actant for the conflation of manufacture or assemblage and proprietorship in its politics of nature. This agent penetrates the governmental machinery involved in green reforms and weakens from within neo-Marxist and poststructuralist critiques. This agent, therefore, constitutes a common issue, addressing which may offer an opportunity for strengthening existing theoretical cross-fertilizations – as between neo-Marxism and post-structuralism, and between post-structuralism and EM – and for rearticulating long-lasting controversies, such as the divide between EM and neo-Marxism on the possibility of reform of market-oriented societies. This agent finds today its promissory materialization in the image of an unlimited, technology-enabled, biological and mental ‘enhancement’, in front of which major theoretical efforts are required. What is arguably needed is a notion of the biophysical world and humanity as carriers of a fundamental alterity to human agency itself; an unattainability that prevents their full reduction to the status of commodity and that allows for criticism of the neoliberal celebration of will in the name of a humbler, historically and biologically embedded, account of human autonomy.

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## Notes

<sup>1</sup> [Peck et al. \(2009\)](#) account for 2500 English language articles in the social sciences that cite neoliberalism as a keyword, the vast majority of which published after 1998.

<sup>2</sup> Knight and Keynes were arguably the first economists to stress this point.

<sup>3</sup> One early, well-known expression of this view is [Weinberg's \(1972\)](#) notion of ‘trans-science’, that is of a field of scientific questions that cannot be scientifically answered.

<sup>4</sup> The obvious example is the fall of the Bretton Woods regime of fixed exchange rates, in 1971,

which allowed the growing financialisation of economy. Of no lesser relevance is the fiscal crisis of New York City, in 1975, when the employees' pension funds were for the first time used to buy corporate bonds (of the Municipal Assistance Corporation). Linking the workers' future incomes to the fluctuations of the stock exchange market means transferring in an abstracted form the capital-labour conflict over the distribution of resources within labour itself.

<sup>5</sup> Genomic research has shown, however, that the connection between genes and traits is often complex, since one gene may be involved in the production of many proteins and there are typically several molecular interactions, cascades and feedback loops responsible for the final phenotype.

<sup>6</sup> Establishing the baselines for carbon reduction calculations presents similar problems ([\[Bumpus and Liverman, 2008\]](#) and [\[MacKenzie, 2009\]](#)).

<sup>7</sup> There are other relevant perspectives that I cannot consider here, for example ecology-inspired scholarship. The latter, however, does not seem to express a distinct standpoint in regard to neoliberalism.

<sup>8</sup> On the other hand, EM scholarship that is more inclined to making a case for 'proper' hybrid ontologies is exposed to the same problems discussed below with regard to post-structuralism.

<sup>9</sup> On this point cf. also [Dean \(1999, Ch. 9\)](#).

<sup>10</sup> This despite current criticisms towards traditional views of the 'economic' as the essential driver of historical events ([\[Gibson-Graham, 2006\]](#)).

<sup>11</sup> This argument has notoriously disparate applications: from GMOs to weapons supposedly hidden in some foreign country.