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The More-Than-Human Life of Capitalism: Assemblages, Affects and the Neoliberal Black Hole

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Abstract: This paper applies a more-than-human, relational, new materialist ontology to ask the Deleuzian question: what does capitalism actually do? The transactions identified in Marx's *Capital* are re-analysed as more-than-human assemblages, constituted by affective flows involving both human and non-human matter. The paper then identifies further more-than-human affects that produce the fluctuations in prices and quantities of goods sold, described in classical economics as the 'laws of supply and demand'. Analysis reveals these affects to be associated with the affective and relational capacities of commodities. The consequences of this more-than-human ontology of capitalism are explored by means of a short case study of the digital economy. This demonstrates how more-than-human affects are responsible for many of the negative consequences of a capitalist economy, including uncertainty, waste and social inequalities. The paper suggests that capitalism is progressively becoming a 'black hole' from which neither workers nor capitalist enterprises can escape, and draws conclusions that diverge radically from both neoliberal and Marxist analyses of capitalism.

Keywords: affect; assemblage; capitalism; more-than-human; new materialism; post-anthropocentrism

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1. Introduction

Political economies of capitalism informed by classical, neo-classical or Marxist economic theory have taken human practice as their focus (Alaimo 2010, p. 2; Hornborg 2017, pp. 98–99; Lettow 2017, p. 117; Swedberg 2005, p. 3), setting to one side any further consideration of the active contribution that non-human matter plays in its dynamics. This paper aims to redress this imbalance, reconstituting a critical political economy of capitalist enterprise via the ontology of the so-called 'new materialisms' (Fox and Alldred 2017; Coole and Frost 2010; van der Tuin and Dolphijn 2010).

A new materialist ontology diverges from conventional political economic accounts of capitalism in three ways (Fox and Alldred 2017, pp. 15–22). First, it replaces the anthropocentric and humanist accounts that have dominated sociological and political economy analyses of capitalism, requiring not only that non-human matter is acknowledged as more than a passive backcloth to human agency and interaction, but that human agency is no longer afforded privilege or primacy.[1] Second, the capacities of human and non-human matter are not static or predetermined, but relationally contextual, emerging always in relations with other matter. Finally, in place of a dualism of agency and structure, of economic base and social and political superstructure, the events that constitute both daily life *and* human history are acknowledged as the only 'level' where more-than-human interactions occur. These two latter features together require a perspective on capitalism not as structural or systemic, but rather as continually constituted from the more-than-human 'affects' (capacities to affect or be affected, to use Deleuze's (1988, p. 124) formulation) between human and non-human matter in actual physical locales such as workplaces and markets (DeLanda 2006, p. 17).

While this ontology of capitalism may seem uncomfortable or perhaps counter-factual from a humanist perspective, a post-anthropocentric, relational and monist ontology enables new insights concerning the dynamics of capitalist production and exchange: dynamics that to economists from Adam Smith to Friedrich Hayek were opaque—an 'invisible hand' (Bishop 1995; Whyte 2019, pp. 158–59). Moreover, these revealed dynamics, far from being the source of the common good, as argued by Smith and Hayek (Swedberg 2005, p. 5), produce many of the negative aspects of the capitalist mode of production, including uncertainty, waste, pollution and social inequalities.

The paper uses as its starting point a micropolitical and more-than-human re-assessment of the social relations of capitalism set out meticulously by Marx ([1906] 2011) in Volume 1 of *Capital*. Applying the ontology developed in the work of Deleuze and Guattari (1984, 1988), production and markets are re-conceptualised as more-than-human 'assemblages', which are brought into being by the relational capacities of human and non-human matter. However, this analysis then moves beyond the core production and exchange transactions identified by Marx, to reveal some hitherto-undisclosed and highly significant more-than-human affects within capitalist assemblages that explicate phenomena referred to by both (neo)classical economists (Marshall [1890] 2009, pp. 284–87; Moore 1925) and Marx ([1865] 2010, p. 109) as 'laws of supply and demand'. These affects establish the relational capacities of commodities, and generate fluctuations in the prices at which they trade *impersonally* and beyond human intentionality (DeLanda 2006, p. 36).

To assess the consequences of these insights, the paper then illustrates how non-human supply and demand affects shaped the emergence and development of the digital economy over the past forty years. These affects contributed to a range of negative unintended consequences, including uncertainty for both workers and corporations, destructive competition, wastefulness, and social inequalities—both within jurisdictions and between global North and South.

The concluding section draws on this analysis of digital capitalism to argue that more-than-human supply and demand affects have progressively immured both workers *and* owners of capital within the assemblages and affects of capitalism. The metaphor of a cosmological 'black hole' is invoked to acknowledge how capitalism has progressively drawn more and more (non-human and human) matter into its ambit, with no clear alternative means of economic survival open to either workers or 'bosses'. This assessment requires different solutions to those espoused either by neo-Marxist political economists or by neoliberal advocates of a fully marketised economy. Some suggestions of ways to use legislation and regulation to undermine supply and demand affects are offered, thereby constraining many of the negative consequences of a capitalist economy and reversing neoliberalisation, without requiring fundamental political transformation.

2. Political Economy and the More-Than-Human Ontology of the New Materialisms

Political economy is the study of the political and social contexts of economic production, trade and consumption of commodities (Harvey 2021, p. 293), while critical political economy addresses and critiques the power relations that shape economic and social organisation in societies, particularly within capitalist economies. For Marx, Engels and neo-Marxist political sociologists, critical political economy addresses the material and structural foundations of the social practices of capitalism (Coburn 2004, p. 41). In this perspective, 'social structure' equates with the social and economic relations of capitalist production (Martin and Lee 2015, p. 715): specifically, the transformation of proletarian labour-power into capital (Marx [1906] 2011, p. 185) and a top-down model of power—vested in a sovereign state and serving the political interests of the capitalist class (Lenin [1918] 1999, p. 16; Poulantzas 1978, p. 190).

This paper analyses political economy differently: via the ontology of the new materialisms. New materialist ontology is now an established paradigm within the social sciences (Connolly 2013; Fox and Alldred 2017), as applied to a variety of topics, including gender (Grosz 1993), race (Saldanha 2006; Thomas 2014), sexualities (Fox and Alldred

2013), environment (Fox and Alldred 2020), pedagogy (Hickey-Moody et al. 2016) and more recently socioeconomic position (Fox and Powell 2021; Fox and Alldred 2022; Mulcahy and Martinussen 2022). It covers a range of different approaches from actor-network theory to posthuman feminism that have in common a focus on relationality and the more-than-human production of natural and social worlds (Braidotti 2013, p. 95).[2] As a preamble, this section will expand briefly on the post-anthropocentrism, relationality and monism of the new materialisms identified in the introduction. It will then assess what such an ontology means for a political sociology of capitalism.

First, by shifting attention back to matter, the new materialisms have been considered an antidote to sociology's 'cultural turn' and post-structuralism (Coole and Frost 2010, p. 7), while its focus on materiality moves significantly beyond previous concerns with material 'law-governed processes' in Marxist historical materialism (Cheah 2008, p. 143). Rather, this new 'turn to matter' is *post-anthropocentric*, addressing the 'more-than-human' aspects of the social and physical world. This, it has been argued, is of particular value in studies that straddle the human/non-human interface such as environment and climate change, disability, gender and health (Dorling 2013; Duff 2014; Fox and Alldred 2018).

Such an elision of the conventional distinction between physical and social worlds opens up the possibility to explore how—alongside human bodies—things other than humans (for instance, the ocean, a tool, a technology or a building) can be 'affective' (possessing a capacity to affect or be affected), making things happen as they affect other non-human matter, or indeed human bodies (Deleuze 1988, pp. 125–26). For instance, Barad (2007, pp. 163–66) identifies a multiplicity of non-human matter that serendipitously affects the production of knowledge during research, while Bennett (2010) variously explores the affectivity of metals, food and electricity grids in her postulation of the vitality or liveliness of non-human matter. This radical, more-than-human, proposition stands in contrast to the standard sociological focus upon human social practices (Foster 1999, p. 368; Latour 2005, pp. 4–6), and the view that attributing agency to non-human matter is a fetishism that mystifies the co-option by capitalism of the natural world in the interest of wealth accumulation (Hornborg 2017, p. 98).

This new materialist understanding of materiality as affective is developed further in a second proposition. Within new materialist ontology, the material world and its contents are not fixed, stable entities, but *relational* and uneven, emerging in unpredictable ways when assembled with other similarly contingent and ephemeral bodies, things and ideas (Deleuze 1988, p. 123). Consequently, scholars should ask of a body (human or non-human, animate or inanimate) not what it *is* (what are its attributes?), but what it can *do* in a specific context: what are its relational capacities? Such capacities are themselves affects; they may be 'positive', enabling actions, thoughts or desires, or 'negative': constraining a body's possibilities for a day, a month or a lifetime. As such, they can be a basis for both temporary and enduring social divisions and inequalities (Fox and Powell 2021).

Third, new materialist ontology is *monist*: that is, it does not acknowledge a foundational or transcendent power or mechanism operating beyond or beneath the surface of everyday activities and interactions (Fox and Alldred 2018; Deleuze and Guattari 1994, p. 35ff.; Latour 2005, p. 8). In place of a duality of agency and 'structures' there are simply 'events'—an endless cascade of material interactions that together produce both the natural and the social world and human history. This flattened ontology runs counter to a tradition in social theory that has regarded stratifications of social position as structural features of contemporary societies (Lenco 2023, pp. 16–17). Instead, it requires us to model power and resistance as continually generated within a messy, heterogeneous and emergent social world (Fox and Alldred 2018; Braidotti 2011, p. 137; Grosz 1993).

In terms of these three more-than-human themes, capitalism must be considered as constituted from *both* human practice and non-human affects; as plural, complex and emergent. A new materialist critical political economy will look beyond human social practices to the relational capacities of all matter, and will explore and explain power and resistance not in unobserved 'social structures' or underlying 'mechanisms' but in the

more-than-human assemblages of everyday interactions and events. At first glance, this post-anthropocentric and ontologically relational perspective upon matter is foundationally inimical to Marx's critique of capitalist production and perhaps the objectives of critical political economy and political sociology in their entirety. Perhaps for this reason, many new materialist scholars have stepped back from attempting a head-on analysis of capitalism. The paramount exception to this has been the collaborative work of Deleuze and Guattari (1984, 1988), in which an analysis of the dynamics of capitalism is central. This DeleuzoGuattarian perspective on capitalism has been assessed and variously developed by subsequent new materialist scholars including DeLanda (2006, 2016), Hardt and Negri (2000), Holland (2014), Lazzarato (2014), Roffe (2016) and the present author (Fox 2022a, 2022b).

Deleuze and Guattari's analysis (which is sympathetic to, but ontologically divergent from Marx's perspective) regards capitalist social relations as highly 'de-territorialised' (that is, untrammelled by social norms, stratifications or other constraints). Unlike earlier economic models such as feudalism, despotism or slavery, capitalism seeks to establish free participation by all in production and market assemblages, regardless of social rank, class or any other social stratification or norm (Deleuze and Guattari 1984, p. 225). Workers voluntarily sell their labour to owners of capital (Deleuze and Guattari 1988, p. 452), while anyone with sufficient money in their pocket can purchase any commodity from any producer or trader (Deleuze and Guattari 1984, p. 290), or for that matter use it as 'capital' (Deleuze and Guattari 1988, p. 453). This de-territorialisation has been in part achieved by the universal acceptance of money as an abstract medium of exchange: money is both exchangeable for any commodity, and possesses the same value independent of who proffers it (Deleuze and Guattari 1984, p. 250; 1988, pp. 442–44).[3]

For some scholars, the advantages afforded by the mature Marx's analysis in *Capital* lay in his specific focus upon 'sensuous human activity, practices' (Lettow 2017, p. 114), and the relegation of non-human matter such as commodities, raw materials, tools and technologies to the status of a backcloth to these human practices *sans* capacities or agency (Hornborg 2017, pp. 98–99). However, others have discerned in Marx's work a far more subtle acknowledgment of the way non-human and human matter interact. Nail (2020, p. 20) argues that Marx's materialism was kinetic: in capitalism everything is in motion, and it gains its dynamism 'from the historical mobility of matter, not the other way around'. Nail suggests that for Marx it was not only human practice that is 'sensuous': so too are commodities and other non-human matters (Nail 2020, pp. 47–48). However, there is a risk of anthropomorphising matter in Nail's (2020, p. 47) suggestion that all matter is both 'self-sensing and self-sensed'. Rather, it is more appropriately and accurately described as 'affective', in the Deleuzian sense outlined a moment ago: both active *and* receptive, affecting *and* affected.

Foster's (1999, 2000) close reading of the later Marx also reveals the significance of what Marx ([1906] 2011, p. 554) called 'the circulation of matter between man (sic) and the soil', in other words, between human and non-human matter, and that this circulation was essential for the well-being of both (Marx [1906] 2011, pp. 555–56). For Marx, Foster goes on, non-human matter was as important as human labour in the production of use-values (Foster 2000, pp. 167–68), while Marx's invocation+ of the labour theory of value was making the point that *within a capitalist economy* the non-human is entirely discounted, being regarded as nothing more than natural resources to be exploited (Foster 1999, p. 387). To consider Marx as humanist or anthropocentric is inaccurate: his focus was upon the interaction between human and non-human (Foster 1999, pp. 397–98).

Moreover, it is significant that the first hundred-plus pages of *Capital* are devoted to the analysis of non-human matter: namely commodities and money. So, while recognition of the affective capacities of non-human matter in new materialist ontology takes a step beyond Marx's theorising of capitalism's 'metabolic rift' (Foster 1999) between nature and culture, arguably this further ontological move to explore the 'interconnections, interchanges and transits between human bodies and non-human natures' (Alaimo 2010, p. 2) would not have been egregiously distasteful to Marx. With this in mind, the following

section takes Marx's analysis of the 'metabolic' circulations of human and non-human matter within production and markets as its starting point, refracting these through the three new materialist lenses of post-anthropocentrism, relationality and monism. To establish a methodology for this endeavour, these fairly abstract propositions can be translated into a toolkit for social inquiry via the conceptual framework to be found in Deleuzian 'ethology'.

Deleuze summarised this ontology of matter in just a few pages of his book on Spinoza (Deleuze 1988, pp. 123–26); this 'ethological' ontology was subsequently applied by Deleuze and Guattari (1984, 1988). Foundationally, ethology is the study of *affects*—defined by Deleuze (1988, pp. 125–26) as 'capacities for affecting and being affected'. In other words, an affect is the force by which one materiality (human or non-human) affects and another materiality is affected. As such, affects are always interactive and relational, marking out what matter can do when interacting with other specific matters (DeLanda 2016, pp. 143–44; Deleuze 1988, p. 123; Deleuze and Guattari 1988, p. 261). More-than-human affects between human and non-human matter are commonplace, from the affective capacities of oxygen to enable human respiration, metabolism and hence life; or the capacity of ethyl alcohol to inebriate; or the capacities of silicon to enable human digital communication and information processing. Affects are thus the sole movers that produce the flow of events in the social and natural world, from the most trivial interaction between two human strangers passing on a street to the entire 'rhizomatic' (Deleuze and Guattari 1988, p. 21) flow of human and non-human history.

Consequently, matter—whether 'human' or 'non-human'—should be defined not by form, substance or fixed attributes, but simply by its *relational capacities* to affect (Deleuze and Guattari 1988, p. 257). What a body or a non-human object can do depends entirely upon its context (the other human and non-human materialities with which it interacts in a specific encounter).[4]

This emphasis on context and relationality led Deleuze and Guattari (1988, p. 22) to describe encounters, interactions or other arrangements between bodies and things as *assemblages*. Assemblages emerge in unpredictable ways around actions and events (Bennett 2005, p. 445; Deleuze and Guattari 1988, p. 88), 'in a kind of chaotic network of habitual and non-habitual connections' (Potts 2004, p. 19), drawn together by their constituents' capacities to affect or be affected (Deleuze 1988, p. 124).

Finally, the ethological task of excavating the flows of affects and capacities, power and resistance within the assemblages of everyday life (or of a socioeconomic mode such as capitalism) is *micropolitical* (Deleuze and Guattari 1988, p. 216; Massumi 2015, pp. 79–80). Micropolitics refers to the flows of power and resistance in assemblages produced by the affects between human and non-human materialities, and the relational capacities they establish (Deleuze and Guattari 1988, p. 213). Such a micropolitical analysis supplies the means to unlock how the world and everything in it is produced from moment-by-moment, and also how it may become other over time, generating the flow of both human and non-human history. The study of capitalism, which in neo-Marxist political economy entails a dualist concern with overarching structures or underpinning mechanisms, becomes a *micro*political economy of affects and assemblages. Consequently, this ontology offers a novel opportunity to explore capitalism as a more-than-human assemblage: one constituted by a multiplicity of affects, many of which involve non-human matter. The objective of this micropolitical economy is to answer—in the broadest sense—the Deleuze-inspired question: 'what does capitalism *do*?'

3. Capitalism: A More-Than-Human Ethology

The more-than-human assemblages of capitalism involve myriad affects.[5] However, the daunting task of mapping a more-than-human political economy of capitalism's affects and assemblages can be facilitated by taking as a familiar starting point Marx's analysis of capitalist social relations, but refracted through the ethological toolkit of assemblages, affects and capacities set out in the previous section. This ethological refraction thereby re-thinks the production and markets transactions in Marx's account as assemblages, the more-than-human affects in these assemblages, and the capacities they produce.

However, the opportunity afforded by the post-anthropocentric and relational ontology of the new materialisms is to de-centre the attention given to human affects such as choices, desires and intentions in classical, neo-classical and Marxian economics. Instead, analysis can fully attend to the affective capacities of non-human matter such as the physical means of production (factories, tools, computers) and commodities, as they interact with human and other materialities, and to explore what they can do. Among these myriad more-than-human affects, this new focus reveals more-than-human affects that establish what classical and neo-classical economists described as the 'law of supply and demand', not identifiable in a purely anthropocentric account (see Section 3.2). This sets the scene for subsequent assessment of how these more-than-human affects produce other capitalist phenomena, including competition, growth, waste and inequalities.

3.1. Affects in Production and Exchange Assemblages

In the first volume of *Capital*, Marx ([1906] 2011) offers his anthropocentric answer to the question of what capitalism does: it harnesses human labour-power (the affective capacity of a human body to labour) to generate capital. According to Marx, harnessing labour-power to generate capital is achieved by means of two transactions. First, a *production* transaction uses human labour to convert a physical or abstract raw material (such as information) into a commodity or other output, for instance within a factory or other workspace (Marx [1906] 2011, p. 458). The second is a *market* transaction that exchanges this commodity for money or other material resources, thereby enabling the capitalist producer to recoup their investment of money and resources in the production process and potentially also generating 'surplus value' or 'profit' (Marx [1906] 2011, p. 168).

These abstracted transactions may be re-analysed ethologically in terms of the affective flows within actual material manifestations of production and market assemblages (DeLanda 2006, pp. 17–18). Such concrete examples of production assemblages include factories, workshops and offices; while examples of market assemblages range from marketplaces and shopping districts to commodity trading floors, and indeed their virtual equivalents. These material instances of production and exchange are assembled by the physical, psychological, social and economic affects between matter—both human and non-human—within these settings. The following cartographies of production- and market-assemblages map the core affects that enable these two aspects of a capitalist economy.[6]

A factory assemblage comprises at least the following human and non-human materialities (in no particular order):

> *workers; raw materials; physical means of production (built environment, tools, technology); managers; boss (owner or shareholders); output commodities*

From an ethological perspective, such a factory assemblage is constituted by a *production affect* between human labour, means of production and raw materials. This affect adds new affective capacities to the latter. For instance, a steel-production affect brings together human labour and a mix of iron ore, carbon, chromium and nickel within a high-temperature furnace to produce a material—stainless steel—with capacities not present in its constituents. Some of these capacities of stainless steel, such as strength, ductility and resistance to oxidation (rusting) have proven more desirable to some consumers than other materials, enabling its subsequent application in construction, cutlery, weaponry and many other areas. The wider significance of these relational capacities is fully developed later in this section.

A market assemblage brings together commodities and money/other resources, producers, retailers and customers within a physical or virtual marketplace. The main material components in the market assemblage are at least (and in no particular order):

> *commodity; producer/seller; customer; competitor commodities; competitor customers; money/material resources; physical market environment*

This *exchange affect* enables a customer to gain access to a commodity's capacities, by means of a transfer of money or other resource to producer/seller. For Marx ([1906] 2011,

p. 43), this human transaction depended upon the commodity's 'exchange value': the price at which it is marketed. Ethologically, 'exchange value' may be understood as an affective capacity of a commodity: one that manifests only at the point at which it exchanges for money; this capacity is the means by which a capitalist producer/seller achieves a monetary return on their investment and a potential profit. This in turn enables re-investment in the means of production (including human labour), thereby sustaining the cycle of capitalist enterprise.

This ethological analysis, with its emphasis on affects and capacities, supplies a post-anthropocentric take on the familiar Marxist analysis. Moreover, scrutinising the cartographies of production and market exchange reveals a crucial feature of the capitalism assemblage. The common thread running through production and market assemblages are the affective capacities of non-human matter, from the raw materials and physical means of production through to the capacities that commodities supply to customers. However, the two affects thus far discussed by no means offer a comprehensive understanding of the entirety of the more-than-human 'affect economy' (Clough 2004, p. 15) of capitalism.

3.2. 'Supply', 'Demand' and the Capacities of Commodities

To explore further the circulations of matter, more-than-human affects and capacities in the capitalism assemblage, the focus now turns to a widely-observed phenomenon in markets of all kinds, described by classical economists as the 'laws of supply and demand' (Marshall [1890] 2009, pp. 284–87; Moore 1925; see also Marx's ([1865] 2010, pp. 109, 115) discussion of supply and demand in *Value, Price and Profit*). According to this so-called 'law', if supply of a commodity increases (and demand stays the same), the price of that commodity will fall. Conversely, if supply stays the same (or diminishes) while demand increases, then the price realised by the commodity will rise. Over time—according to these 'laws', supply and demand will establish equilibria in terms of both market price and quantity of sales.

Supply and demand affects are key features of many aspects of life in contemporary capitalist societies, from consumer energy and food costs to raw materials for industry. Classical and neo-classical economists have wrestled with explanations of this phenomenon for over two centuries, taking as their focus the human actors (producers, customers, traders) in the production and market assemblages outlined earlier. Classical economists such as Adam Smith, John Stuart Mill and Jean-Baptise Say sought an understanding in terms of customers' 'willingness to pay' a particular price for a commodity, and producers' 'willingness to accept' that price in return (Inoua and Smith 2020, p. 1): prices of commodities evolved as a consequence of competition between suppliers and between customers. Neo-classical economists (which emerged toward the end of the 19th century) such as William Jevons and Léon Walras instead argued that market behaviour depended upon sophisticated reasoning by individual human participants, with consumers aiming to maximise the utility acquired through a purchase, and producers attempting to maximise prices and hence profit (Inoua and Smith 2022). In line with his focus upon human labour in the creation of value, Marx ([1865] 2010, p. 117) considered fluctuations in prices due to supply and demand of little consequence, arguing that when supply and demand were in balance, market price would be close to a commodity's 'natural value'—a value established by the quantity of labour required for its production (Baumol 1974, p. 55; see also, Marx [1894] 1974, pp. 177–79).

A setting-off point for an alternative more-than-human perspective on supply and demand that de-centres this focus upon human decision-making comes with DeLanda's (2006, p. 36) recognition that while individual decisions to buy or sell a commodity may be intentional, the prices at which they trade in a capitalist market are determined *impersonally*: as 'an unintended consequence of these intentional actions'. To unpack this further, an example of supply and demand affects from beyond the realm of economic transactions is instructive.

Most readers will be familiar with how road traffic volume affects journey time. As numbers of vehicles using a highway increases (demand), the capacity of roads to sustain free movement between points A and B (supply) decreases, because the amount of road surface available is fixed, and fast-moving vehicles require a much greater quantity of physical road surface to travel safely than slower or stationary vehicles (Greenberg 1959, p. 82). As demand exceeds supply, the highway becomes physically clogged with slow-moving vehicles and journey times increase dramatically.[7]

This road traffic assemblage may be mapped cartographically as (in no particular order)

road surface; vehicles; drivers; vehicle payload (human and non-human); other roads

Though multiple drivers have chosen independently to make the journey from A to B, the more-than-human affect determining journey time depends on the *capacity* of one element (commodity) in this assemblage: the capacity of the road surface to enable (affect) vehicular travel. This capacity is materially provided by its constituents (stone, tarmac, etc.), and materially acquired and consumed by road users. The quantity and quality of road surface available (from a single-track country lane through to an eight-lane highway) is the 'supply' of this commodity's capacity for transport. The aggregated 'footprint' of all the vehicles travelling on the highway defines the level of 'demand': as volume of traffic increases, vehicles are forced to travel more slowly.

Analogous with an economic transaction, the price to drivers of travelling from A to B will vary depending upon levels of supply and demand. Price in this illustration is not primarily economic: rather it is the opportunity-cost of the time the journey takes, time that could be used for other purposes. When the road is busy (high demand), the opportunity-cost of the journey increases. Open additional road lanes (increasing supply) and journey times decrease; close lanes for roadworks or accidents (reducing supply) and journey times lengthen. These fluctuations are entirely unrelated to the individual choices, intentions or desires of road users; rather, it is simply the affect between road surface (the commodity) and the volume of vehicles using it that determines the price (time taken) of the journey. At busy times, drivers have no way to influence the time the journey will take, and are faced with a forced-choice between two unattractive options: either to persevere and accept the opportunity-cost of using the road, or find an alternative route (that is, a rival commodity) which may be as badly or even more congested. Ironically, by thus marginally reducing demand for the road surface, such choices will reduce the price (opportunity-cost) for other users of the original highway.

This example demonstrates how, from an ethological perspective, 'supply' and 'demand' need to be explored affectively, as consequences of the *relational capacities* of commodities offered within a market. In this more-than-human exchange-assemblage, the relational capacities of commodities are the *supply*; the extent to which these capacities positively or negatively affect potential users or consumers determines the *demand*. With this understanding, this insight can be easily translated to a market exchange scenario. Consider a brand of tea T_1 that has the capacity to produce a brew that refreshes and relaxes some consumers. Customer C_1 is positively affected by a commodity with this capacity, as are other customers (C_2–C_n) using the marketplace that day, while other market visitors are unaffected by this capacity. When the market opens, T_1 is available at various prices at different market stalls. Throughout the day there is a steady flow of exchanges with customers at the lower-priced stalls; when these stalls run out, customers face a forced choice: either to pay a higher price at another stall, or to leave empty-handed.

In a competitive capitalist market, the flow of supply and demand affects in the exchange assemblage is more complex. Customers will usually be exposed in a marketplace to a range of tea brands (T_1–T_n), with these brands' diverse capacities affecting customers in differing ways. For customer C_1, the strong or well-flavoured brew offered by T_1 will be most positively affective; for another, it is T_2's odour that is affective; a third has been accustomed since childhood to T_3; for one more T_4 is similar in taste to a premium, less-affordable brand. These divergent relational capacities merely complicate the underlying dynamic by which capacities of commodities create supply, and the extent to which these

capacities positively affect potential customers constitutes the demand for different tea brands. More affective capacities (perhaps, in the example: the refreshing capacity of tea) will lead to a greater number of successful exchanges than capacities that affect consumers less (such as brightly coloured packaging).

It is this dynamic that establishes levels of demand in a marketplace hosting a range of tea brands, and in turn produces the fluctuations in prices and quantities sold and the equilibrations described in classical economics (Moore 1925). Were a new brand of tea T_5 with more of the capacities positively affecting different consumers to be manufactured, it might swiftly out-compete all its rivals. Confronted with falling demand for their products, manufacturers of T_1 to T_4 then face the choice between two unattractive options: either to trim price margins to attempt to revive sales, or accept the poor sales figures and reduce the volume of units manufactured. As will be seen in the case study of the digital economy that follows this section, both choices can have devastating consequences for a business.

To summarise, the ethological analysis conducted in this section has demonstrated how relational capacities of commodities (in the broadest sense) circulating through production and market assemblages establish the dynamics of a capitalist economy. However, it is important to note that this re-analysis of capitalist markets in terms of more-than-human affects is not merely a materialist explication of Adam Smith's 'invisible hand' (Bishop 1995, p. 167) or a Hayekian 'spontaneous order' (Whyte 2019), which these scholars argued enabled capitalist markets to self-regulate for the common *good*, independent of individual participants' (good or bad) intentions. As will become pellucidly clear in the following illustration of more-than-human affects in the digital economy, these supply and demand affects in no way serve the common good. By contrast, it reveals how these affects are responsible for a number of 'unintended consequences' ('unintended' from the point of view of human participants in a capitalist economy) that are often considered the most undesirable aspects of capitalism.

4. The (Micro)political Economy of Digital Capitalism

The electronic information and communication technologies (ICTs) innovated over the past 40 years has transformed the contemporary human environment economically, politically, socially and experientially (Fuchs 2015, p. 22). These technologies include the personal computer, cellular/mobile phone technologies, the internet, digital broadcasting, broadband and streaming services, audio and video technologies, and myriad digital applications. This digital economy has impacted daily life from online shopping and banking through healthcare and education to home-working and self-employment, challenging many conventional modes of economic transaction.

The ethological framework applied in the previous section supplies the basis for a (micro)political economy of digital capitalism analysed in terms of affects, assemblages and relational capacities. It chooses an arbitrary starting point: the development of the first stand-alone desktop computers in the early 1980s, and ends at the present day, drawing examples from the principal digital technological developments. The premises underpinning the following review are (a) that the remarkable proliferation of digital technologies has been achieved principally through entrepreneurial activity within a capitalist competitive market (Wittel 2015, p. 69), and (b) that the shaping of this digital economy has been piecemeal, rather than developed according to any kind of overarching objective or vision. Forty years on, supply and demand have meant that the digital economy is increasingly dominated by multinational corporations, ranging from consumer brands such as Apple, Google and Microsoft, to the almost-anonymous 'Tier 1' telecommunications giants that provide and charge for connection to the internet's physical networks (Prince 2014).

This capitalist digital economy is interrogated in the following sub-sections via the critical question: what can a digital technology do—socially, economically and politically? In other words, what are its affective capacities?

4.1. A Digital Technology Can Provide Novel Capacities

IBM's development of the personal computer (PC) in 1981 supplies a generic illustration of the affects in the production and market assemblages outlined in the previous section. While their machine was predated by the Apple Macintosh and microcomputers from Commodore, Sinclair and other small start-ups in the 1970s, IBM's breakthrough was its adoption of 'open architecture'. This enabled mass production using off-the-shelf hardware and software (Abbate 1999, p. 1697), based around an Intel microprocessor, a memory chip, two floppy disk drives (optional hard disk drive on later models), power supply, keyboard and video display unit, along with Microsoft's DOS operating system (Williams 1982). This open architecture became an industry standard for PCs, up to the present day.

Depending on specification, in 1981 the IBM PC sold for between USD 2600 and USD 3800 (rising to USD 5800 for the top-of-the-range machine in 1984), making it a desktop machine primarily aimed at a business market (Ahl 1984). With no major competitors in this field, half a million PCs sold in the first 18 months, twice IBM's initial expectation (Boka Raton Historical Society 2021). These sales bolstered a corporation that had previously majored in mainframe computing, and are an exemplar of the two capitalist assemblages of production and markets set out in the previous section. The core affect in the production-assemblage turned out a novel product whose capacities were greater than those of its the component elements, while the market-assemblage enabled the PC to be sold, thereby enabling IBM to re-coup its investment in the design, manufacture and marketing of the machine. In addition to these two affects, further supply and demand affects between the capacities of the PC (such as functionality, size and price) and a large quantity of customers affected positively by these capacities supplied the company with a healthy profit.

4.2. A Digital Technology Can Compete

This subsequent history of the IBM personal computer illustrates a further feature of the capitalist assemblages: how supply and demand affects shape the dynamics of production and consumption in a free-market environment, beyond the control of individual manufacturers and their customers. Having successfully filled a niche in the market for a business machine for desktop use, IBM's strategy of using off-the-shelf components to build its PC backfired. Competitor providers were able to write alternative versions of the limited amount of copyrighted software (the BIOS) in the IBM machine (Schwartz 2001) and subsequently market 'IBM-compatible' machines. Compatible 'clones' of the PC were marketed at a lower price point and with enhanced specifications (Mace 1984), thus not only undercutting IBM, but also appealing to a wider non-business market (Cook and Langdell 1984). Despite efforts by IBM to introduce a new generation of PCs with software that could not be so easily cloned, its market share progressively declined from an original monopoly to just 7 per cent by 1991 (Ferguson and Morris 2002, pp. 83-88). In 2005, it sold its personal computing division to one of its clone rivals, Lenovo.

This impact of digital commodities' affective capacities upon supply and demand has been reflected in both innovation and consolidation phases in different sectors of the digital economy. During the innovation phase, these affects enabled novel digital technologies such as the cellular/mobile phone, the world-wide web or a computer hard drive to compete successfully with copper-wire telephony, libraries and magnetic tape memory storage, respectively. These new technologies gained market share by demonstrating enhanced or novel capacities, or alternatively by supplying equivalent capacities at a lower price point. However, during the consolidation phase, competition to offer these capacities has threatened an innovator's market share as rival producers entered the market. For example, Motorola—the pioneer of cellular phone technology, was displaced as market leader by Nokia in the late 1990s (Cheng 2014); subsequently, Nokia has been surpassed by Samsung, Apple and relative newcomer Huawei. Popular social media applications such as MySpace, Friendster or FriendsReunited have withered as subsequent apps such as Facebook, Twitter/X, Instagram and TikTok, with capacities attractive to larger consumer-bases, emerged. When undercut by competitors, the supply and demand affects in the

capitalist market doomed such innovators to business failure or takeover, because—in the global capitalist economy—no commercial alternative to the competitive market model is widely available.

4.3. A Digital Technology Can Be Wasteful

The cut-throat business dynamics generated by supply and demand affects just noted are also hugely wasteful of resources in both innovation and market consolidation phases (Horton 1997, pp. 128–29). When excess supply of desirable capacities depresses exchange values, producers have two choices: either to sustain surplus value generated per unit of commodity and accept market share decline as other traders undercut them with their products, or alternatively to trim margins to sustain market share, cutting into surplus value (Wrenn 2016). Both result in waste.

A notable example of material waste in the digital economy was the progressive technological developments in audio and video media. Analogue technologies such as vinyl discs, cassette players such as the Sony Walkman, cartridge players, and VHS and Betamax video players all had their respective heydays, but then became victims of subsequent digital technologies with more affective capacities. Capacities of novel technologies such as mini-discs and laser video discs failed to capture sufficient market interest, while the commercial success of compact disc (CD) and digital versatile disc (DVD) capacities wiped out most use of vinyl and magnetic tape. However, these technologies have subsequently lost out in turn to digital audio and video streaming services such as Spotify, Apple Music and Netflix, though vinyl has seen a niche resurgence due to supposedly richer aural capacities and is hence affective for some music connoisseurs. While the 'creative destruction' (Schumpeter [1943] 2013, pp. 83–84) of capitalist innovation and competition was celebrated as socially and economically progressive by economist Joseph Schumpeter, it confirms the inherent wastefulness of the capitalist mode of production. With each successive iteration of new technologies, resources (both non-human and human) used to produce unsold commodities have been wasted commercially, potentially forcing once-profitable businesses into unsustainable losses, to be followed by bankruptcy, or takeover as share prices tumble and investors evaporate. Moreover, when businesses producing such media and the hardware to play them folded as a consequence of supply and demand affects, workers lost jobs and income, skills acquired through training dissipated, means of production such as factories and equipment became derelict, all contributing further to the despoilation of both human society and the environment (Knuth 2017, p. 105; Strangleman et al. 2013).

4.4. A Digital Technology Can Exacerbate Social Inequalities

The digital economy is also an exemplary case study of how affects associated with supply and demand in capitalist economies generate and sustain social inequalities. While marketing of novel capacities within the digital economy has delivered some social and economic benefits to consumers (for instance improved connectivity, convenience of online services, and opportunities for small entrepreneurs), these benefits have not been shared equally. Over the past 40 years, what has been described as a 'digital divide' (van Deursen and Dijk 2019) has emerged between rich and poor, old and young, those with and without digital skills, and between global North and South (Fuchs and Horak 2008).

For example, investment in fibre optic cabling by private companies has been limited to geographical areas where the density of population (potential demand) can bring a financial return on the high cost of installing infrastructure. This affected not only consumers' access to services such as entertainment streaming, but also to services such as telemedicine (Benda et al. 2020) and business enterprise in rural or remote areas (Xu et al. 2019). Access to fast broadband may also affect the development of skills to exploit digital technologies, creating what has been described as a 'second-level' digital divide (van Deursen and Dijk 2019, p. 371), with implications both within nations and between global North and South.

Meanwhile, supply and demand affects in the labour market have enabled internet-powered businesses to undercut traditional employers in fields including high street stores, taxis and financial services, replacing skilled jobs with precarious and lower-paid unskilled work such as parcel couriers and call-centre staff (Huws 2013; Huws et al. 2019), not significantly offset by demand for a comparatively-small cadre of highly skilled computer scientists to develop, maintain and expand this new economy.

The wider social, economic and political significance of this more-than-human analysis of capitalism and its 'unintended' consequences of competition, waste and inequalities are discussed in the following section.

5. The More-Than-Human Affects of Neoliberal Capitalism

This illustration of the capitalist digital economy suggests that three of the most-frequently criticised aspects of capitalism derive directly from supply and demand affects associated with the relational capacities of commodities (rather than from the inattentiveness, fecklessness or callousness of human agents). First, these affects create uncertainty within the production process and labour market. The price that a commodity yields in a competitive market environment is wholly dependent upon the availability of rival commodities and the demand for their capacities, over neither of which producers have any control. As noted, when market prices for a commodity fall, producers have a forced choice: either to fix a price and lose market share, or cut prices and increase production to sustain market share (Wrenn 2016, p. 63). The latter path is preferable, but leads to excess supply, resulting in further uncertainty among rival producers.[8]

Second, and concomitantly, supply and demand affects generate wastefulness. Both the options outlined in the previous paragraph will result in waste. Without increased demand, excessive supply by competing producers seeking to sustain market share will result in more and more unsold products. These may either go to landfill, or be remaindered at a loss, in which case the labour used to produce them will (from a boss's point of view) be 'wasted', as it does not generate surplus value. Alternatively, if producers maintain their prices and accept loss of market share, this too will result in unsold products, and may over time lead to business unviability and demise, with resultant waste of means of production (factories, tools, technology) and skilled labour, as was seen in the 'de-industrialisation' phase of Western capitalism, as services and knowledge industries superseded heavy industry, manufacturing was out-sourced to low-wage economies (Foliano and Riley 2017, p. R13), and industrial heartlands were transformed into 'rust belts' (Strangleman 2001, p. 256).

Finally, commodity affects associated with supply and demand in a global market operate independently of consumers' capacities to pay for commodities or services, establishing inequalities between higher and lower paid workers, and between high and low wage economies. Furthermore, in the face of the unattractive alternatives already outlined, producers attempting to assure business continuity may be forced to reduce production costs by hiring lower cost labour such as migrants or ethnic minorities, or limiting the size and quality of the work-place environment and work infrastructure such as washing facilities and workers' leisure spaces (Fox and Gavrilyuk 2022). These remedial efforts all contribute to continuing and worsening social inequalities across capitalist societies.

This analysis also suggests how capitalism has established itself as the dominant global economic model, eventually overwhelming rival economic models in countries such as the Soviet Union and China, and progressively transforming any remaining pre-industrial societies into 'developing' (capitalist) nations. While a market model may seem a seductively attractive opportunity for new businesses with novel products to sell their goods or services profitably, once in the market (as was seen in the illustration from the digital economy) supply and demand affects proliferate competitor commodities, prices are driven down and businesses have no alternative but to compete, and either lose initial market share or trim margins and grow output.

As more and more workers and enterprises in different sectors have been drawn into the capitalism assemblage, the metaphor of a 'black hole' is apposite. Like its cosmological analogy, capitalism is progressively incorporating more and more economic activity into its ambit. Yet once inside this black hole, there is no escape: a commercial enterprise disenchanted with the vicissitudes of supply and demand cannot easily exit from the capitalist marketplace. For a while, a niche market might be carved out, but sooner or later, competitors will smell the potential of profit and move in, making the renegade enterprise once again subject to supply and demand affects. Meanwhile, a worker no longer willing to sell their labour-power has few alternatives: an impoverished existence on benefits or a meagre pension; a life of crime; or attempts to make a living through self-employment, the latter of which draws them back into capitalism's black hole.

This black hole has emerged progressively, facilitated by centuries of de-regulation and liberalisation of production and markets in major economies such as the US, EU and Australia. Advocates of capitalism since Adam Smith have aspired toward an ideal of a 'perfect market' freed of 'distortions' of market behaviours, prices or outcomes by monopolies, subsidies, tariffs, duties and so forth (Anderson et al. 2013; Lang 2019, pp. 694–95): such perfection being the asserted means for both workers and bosses to prosper financially (Bishop 1995, p. 165), and bring stability to global capitalism (Lang 2019, pp. 677–78). Free trade agreements, ends to restrictive labour practices, limits upon trade union powers and the eradication of subsidies and other distortions have all sought to hasten the move toward this 'perfect' global free market (Palley 2005, p. 26).

The past decades have cranked up this trend, with the neo-liberalisation of everything, based on the premiss that the market knows best, and alone should be 'the source and arbiter of human freedoms' (Mudge 2008, p. 704). Politicians and ideologues of the right have embraced this doctrine, and public services such as health, education and public transport are being gradually privatised or marketised (Estrin and Pelletier 2015). Digital technologies have enabled 'Web 2.0' platforms such as AirBnB, Etsy and Ebay to develop new markets for businesses run from citizens' back bedrooms, and online providers such as Amazon and Uber that undercut existing high-street enterprises (Vallas and Schor 2020). Meanwhile, as globalisation and the outsourcing of capitalist production and markets to the global South intensifies, more and more of the world's population is being drawn into this black hole.

The analysis of capitalism undertaken in this paper suggests that the neoliberal strategy is not only misguided, but is actually accelerating the gradual impoverishment of both workers and enterprises, as previously unacknowledged non-human supply and demand affects operate beyond human intentionality within capitalism assemblages. Neoliberalisation and globalisation trends within contemporary capitalism are wreaking havoc, not only by impoverishing more and more workers in both global North and South in low-paid and precarious employment and a cost-of-living crisis, but also by degrading the environment through waste and by locking nations into the relentless pursuit of economic growth (Fox 2022b). Some suggestions for countering both the actions and the consequences of these affects are outlined in the concluding section.

6. Concluding Remarks

The insight that the assemblages and more-than-human affects of capitalism ensnare both workers and the owners of capital in a metaphorical black hole suggests a significant ontological break from both a neo-Marxist critical political economy *and* from the neoliberalisation and globalisation proposition that dominates contemporary right-leaning political ideology in the global North. On one hand, Marx, Engels and Lenin considered the social relations of capitalism as a mechanism by which workers' labour power (capacity to labour) is exploited to generate surplus value (Lenin [1918] 1999, p. 16; Scambler 2007). On the other, neoliberalisation is an ideological project which seeks to establish and extend a free market in labour and goods, in the belief this is the best means whereby to increase prosperity and wealth for all (Mudge 2008, p. 706). For the former, the only solution was

the replacement of capitalist social relations and capitalist state with a socialist alternative in which the means of production would become common property and commodities would be distributed according to need (Lenin [1918] 1999, pp. 79–80). For the latter, the efficiency and effectiveness of every aspect of the economy must be maximised by allowing market forces to replace the 'distortions' produced by State interventions, restrictive labour practices and international trade tariffs (Palley 2005, p. 22).

The revelation that it is the relational capacities of commodities that have generated both the 'black hole' of capitalism and some of the most egregious consequences of capitalist production and markets suggests solutions that diverge from both these futures, of relevance not only for social theory, but also for workers, entrepreneurs, politicians, economists and activists. The inexorable growth, waste and social inequalities that threaten not only human economic survival, but also environmental catastrophe (Fox 2022b) can be addressed—though not via the unrealistic proposition of an imminent global socialist revolution to entirely dismantle capitalist social relations, nor by the delusional efforts by neoliberal politicians and policy wonks to pursue actions that only deepen the black hole.

Instead, the 'unintended' consequences of supply and demand affects can be addressed at source via the democratic policymaking and implementation process, in a strategy with three components. First, to dispel the notion that neoliberalised capitalism benefits society as a whole, but rather to acknowledge that capitalism's unchecked growth is harming not only individuals but also the environment and climate due to resource depletion, excessive growth and waste. This element of the strategy is directed particularly at advocates of neoliberal and market-oriented policies, and to the media and public. The objective would be to roll back and dismantle misguided efforts to introduce a free market (and hence supply and demand affects) into public sector areas such as health and social care, education, justice, transport, telecommunications and energy production.

Secondly, the strategy would promote diverse economic models, such as non-profit ventures, social enterprises, and workers' cooperatives. Additionally, it suggests reclaiming public control over utilities, transportation, digital services, and energy production, with selective ownership in key sectors. While privatisation brought injections of capital to industries such as water processing, telecoms and transport (UNCTAD 2008, pp. 130–31), there is powerful evidence that 40 years of privatising such utilities and core infrastructure has led to rising prices and increasing inequalities in access for consumers (Clifton et al. 2011, p. 663; UNCTAD 2008, p. 140). Nationalisation, golden-share ownership and government franchises of industries such as water, energy, public transport and telecoms can provide a quick win against the trend to neoliberalise services, while political intervention can also reverse trends toward marketising services such as health and social care, education, prisons and probation services, social housing, welfare benefits management. Consider treating mobile phone and Wi-Fi as core utilities, with publicly owned provision of networks.

The third element involves reintroducing what in classical and neo-classical economics have been considered as 'distortions' to the smooth operation of a free-market capitalist economy. These distortions includes price regulation and granting monopolies or exclusive licences to manufacturers (for example, of food basics and household essentials) in return for price caps or controls; fiscal measures to promote socially beneficial innovations, and penalties for excessive resource extraction, overproduction, and waste; subsidising consumer purchases of products produced locally; supporting repair, refurbishment, recycling, re-use and upcycling of materials; punitive taxation on new extraction of resources, including fossil fuels, alongside tax breaks for renewable energy and electric storage technologies.

Many such initiatives can be achieved through fiscal policies that shift costs and benefits in the intended direction. The objective is not to engineer the collapse of the capitalist market economy (an endeavour doomed to failure if not undertaken globally), but to put in place both top-down and bottom-up checks and balances that address the negative consequences of supply and demand, and instigate and entrench a mixed economy in which capitalist entrepreneurship is no longer the sole economic model. Alongside the three strands outlined, it will also be crucial acknowledge that these changes need to be

enacted and supported globally. This can be facilitated with increased international aid to decrease global North–South disparities and enable emerging nations to implement the strategy, and a longer-terms objective of reducing conflicts and wars arising from territorial and resource disputes fuelled by the inequalities produced by international capitalism. Overall, this programme would establish a comprehensive shift in the dynamics of contemporary economies and associated political frameworks.

In conclusion, this paper has demonstrated novel insights through the application of a more-than-human materialist analysis of capitalism. The ethological exploration of the affects in the assemblages of capitalism revitalises political economy and political sociology by moving beyond the anthropocentric assumptions that have dominated these disciplines. Moreover, it suggests immediate practical and highly achievable actions to address the most damaging consequences of these capitalist assemblages, and a political agenda for rolling-back the neoliberalisation of the economy, the environment and life itself.

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Notes

1 The past decades have seen the gradual acknowledgement of a need to re-balance the post-war sociological privileging of human agency (Foster 1999, p. 401) over the capacities of other matter to affect (Bennett 2010, pp. 4–16) and its elevation of 'the social' as a realm independent of the natural world (Latour 2005, pp. 4–6). While this re-balancing was notable within post-structuralism and in an emergent environmental sociology (Dunlap and Catton 1979; Stevens 2012; Urry 2009), it has been most floridly exhibited in the 'turn to matter' of so-called 'new materialist' and posthuman scholarship (Alaimo 2010; Coole and Frost 2010, pp. 26–27; Diener 2020, p. 45; van der Tuin and Dolphijn 2010). The term 'more-than-human' in this paper is intended to encapsulate this post-anthropocentric turn, while not denying the affective capacities of human bodies.

2 For a comprehensive survey of new materialist scholarship, see (Coole and Frost 2010; Diener 2020; Fox and Alldred 2017).

3 The de-territorialisation of capitalist social relations has been promoted most insistently within contemporary 'neoliberal' aspirations toward a market entirely freed from regulation and outside interference: an issue this paper later discusses.

4 This relational understanding problematises categories based on inherent attributes such as 'human', 'woman', 'white' (Braidotti 2011, p. 130; Colebrook 2013, p. 36; Deleuze and Guattari 1988, p. 275).

5 In addition to the production and market affects discussed in this section, there are affects associated with the extraction of raw materials and its impact on the natural environment; waste and pollution, including greenhouse gas emissions, due to capitalist industrialisation; workplace injuries and negative health impacts on human bodies. As will be seen, many of these negative consequences of capitalist production are linked to supply and demand affects discussed later in this paper.

6 In DeleuzoGuattarian terms, a cartography maps the materialities in an assemblage, the affects between these, and the capacities thereby produced (Deleuze and Guattari 1988, p. 260).

7 From an anthropocentric perspective, traffic jams have been regarded as a 'collective action problem' in which individuals choose actions independently while in an interdependent situation (such as a highway), with negative outcomes for all involved (Ostrom 2010, p. 155). This scenario has been conventionally addressed as a purely human 'problem', and understood and potentially 'solved' through game theory and theories of human behaviour (Ostrom 2010). These 'solutions' take no account of the broader affective flows that involve non-human as well as human affectivity.

8 This second response to uncertainty also provides an explanation of the inherent drive to growth observed in capitalist economies (Gordon and Rosenthal 2003).

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