

**NOTES TOWARDS A SPATIAL READING OF MARX'S FRAGMENT ON
MACHINES**

John A. Sandell

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Approved by:

John Pickles

Scott Kirsch

Alvaro Reyes

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ABSTRACT

John A. Sandell: Notes Towards a Spatial Reading of Marx's Fragment on Machines (Under the direction of John Pickles)

This thesis contributes to the current project of developing new critical urban theory in response to the economic, social, and technological transformations of the early 21st century. More specifically, it focuses on a recent metropolitanization of post-Workerist theories of cognitive capitalism by arguing for a need to more carefully interrogate the underlying base of such theories and its implications for the contemporary theorization of cities. In particular, a section in Karl Marx's notebooks known as the Fragment on Machines is identified as a key text that provides the foundation for contemporary theories of cognitive and post-industrial capitalism. Drawing on a largely forgotten book by eminent spatial theorist Henri Lefebvre, I suggest the importance of reading and thinking Marx's Fragment in *spatial* terms. Introducing the problem of space, I argue, provides an important corrective to current attempts to urbanize theories of cognitive capitalism.

For Dad, wherever you are. Your eccentric bravery continuous to inspire.

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1. VIGNETTES

London, England, December 2012: Mayor Boris Johnson, together with Prime Minister David Cameron, opens the “Electric City” conference at the London School of Economics by revealing a set of large-scale investments in London’s digital infrastructure. These investments particularly target an area of the capital city colloquially known as the “Silicon Roundabout” because of its high concentration of tech firms. In his opening speech Johnson argues the city’s legacy of scientific and technological innovation “drove” the industrial revolution that once made London “the heart of the greatest industrial and commercial empire the world has ever seen”(Urban Age 2012). Building on this tradition, Johnson continues, the city’s new investments in digital infrastructures were once again “asserting London’s lead as the tech capital of Europe, if not the world” (Ibid).

...

Rio de Janeiro, Brazil, 2010: Mayor Eduardo Paes partners with IBM to install an “urban control center” – a centralized hub for information processing and management of city services. The control center gathers over 20 city agencies under one roof, houses an 80 square meter high-definition video wall, (“the biggest in Latin America”) and is populated by personnel donning identical white jumpsuits(Soffel 2013). This center continuously collects data from a wide array of sensors located throughout the city, tracking the daily unfolding of traffic, crime, public transportation and weather events. Organized around a “smart” map of the city overlaid with real-time data, the center aims to create an integrated system, both to coordinate everyday services and to anticipate and divert potential crises. The “biggest benefits” of the urban control center, Mayor Paes tells CNN in an interview, “are the bad things that don't happen, that won't

come to reality because of it"(Soffel 2013).

...

USA, October 22nd 2014: Thousands of drivers working for the “ride sharing service” Uber go on strike in five major American cities. Protesting against exploitative working conditions and dwindling incomes, the workers’ strike is triggered by the company’s decision to lower the price of its services while also increasing its cut of the fares to 20-28% depending on the service and location (Burns 2014). Started in 2009, Uber operates a smartphone application that, according to their website “quickly connects drivers with people who need a ride”(Uber 2015). Part of what is commonly referred to as the “sharing economy,” Uber’s business model is to provide a platform for facilitating the “ridesharing” transaction between drivers and potential customers. The company does not own any cars and employs minimally, instead relying on the labor and assets (in this case, cars) of independently contracted drivers who constitute a highly flexible labor force. This independent contractor model also makes it difficult for drivers to unionize. However, faced with the increased difficulties of making a living, drivers have recently organized several associations including the California App-based Drivers Association (CADA) and the London Private Hire App-based Drivers Associations (LPHADA), which have been central to the coordination of recent protests. As Yaseen Aslam, member of LPHADA, explains: “At the end of the day, it is the drivers who make Uber successful ...Without them, Uber’s technology is useless” (Burns 2014).

...

New York City, USA, May 2013: Representatives from 14 major cities, among them London and Rio de Janeiro, are invited to New York City for the inaugural “Digital Cities Symposium.” The main goal of this event is, according the press release, to “create a global forum for city government practitioners to share best practices in digital development”(NYC.gov 2013). The symposium marks an important milestone in the NYC Digital Initiative, a project established by Mayor Michael Bloomberg’s administration in 2011 with the explicit goal to make New York

City into the “world’s leading digital city”(Ibid.). So far, the initiative has included a broad set of projects ranging from large investments in digital infrastructure such as fiber-optic and Wi-Fi networks, to an extensive open data policy making over 2000 of the city’s datasets available to public and private interests. Additionally, as part of NYC Digital, New York City has partnered with three private universities to launch an “applied sciences initiative,” created with the goal to strengthen the presence of computer and data-centered expertise in the city. This initiative alone is referred to by the mayor as “the largest and most far reaching economic development effort that the city has undertaken in modern memory”(Columbia.edu 2012).

2. BROAD INTRODUCTIONS – SETTING THE SCENCE

In the mid-1990's, popular books such as Bill Mitchell's *City of Bits* (1996) and Nicholas Negroponte's *Being Digital* (1995) provocatively argued that the spread of digital networks and computer technologies were rapidly diminishing the importance of traditional cities as spatial condensation points for social, political and economic processes. Cyberspace, Mitchell suggested, was "profoundly anti-spatial" (1996, 8), and its growth was leading the way towards a further decoupling of accessibility and interaction from spatial proximity. Some even went so far as to argue – in what can best be described as a techno-fetishistic precursor to what Thomas L. Friedman would later call the "flat world" – that digital networks would soon spell "the end of geography" (Friedman 2005; Moriset and Malecki 2009; Thielmann 2010, 3). These hyperbolic propositions were made at a time when the widespread adoption of information and communication technologies (ICTs) had already facilitated a post-Fordist restructuring of global capitalism, rapidly transforming many former industrial production hubs in Europe and North America into seemingly obsolete and barren urban wastelands. What Manuel Castells would theorize as the "rise of the network society" seemed to only further establish this intimate connection between digital technologies and an epochal shift towards a post-cold war, globalized footloose economy coordinated through financial and informational networks (Castells 1996). Even critical theorists bought into this vision by famously proclaiming that the defining characteristics of this millennial society was the simultaneous pervasiveness and placelessness of capital and power (Hardt and Negri 2000).

Geographers were less easily persuaded by this vision of an increasingly "deterritorialized," "smooth," and "friction-less," global "Empire" produced through global

networks. Instead, they argued that these networked technologies and the economic processes they facilitated remained thoroughly embedded within uneven material, social and political territories (see for example Smith 2005). The networked society, then, wasn't so much doing away with the importance of geography as it was producing a whole set of new geographies in urgent need of analysis (Crang et. al. 1999). However, even these more critical approaches (and they came in many different forms), often departed from, and reproduced, certain ideas of a fundamental historical shift of importance from cities to digital networks (Crang and Graham 2007). As some argued, digital networked technologies and the globalizing processes facilitated by them were leading to a rapid splintering and peripheralization of many urban landscapes (see for example: Graham and Marvin 1996; Graham and Marvin 2001).

The starting point for this thesis is the recognition that over the last decade, ideas of an antagonistic relationship between digitalization and urbanization have largely given way to a view of these processes as more or less mutually constitutive (Graham 2004).¹ As cities have become the sites of deployment of increasingly complex technical systems, researchers have turned their interests to the complicated entanglements of computers *and* cities (Crang and Graham 2007; Kitchin and Dodge 2011; Thrift and French 2002). And as global urban populations continues to rise and urban landscapes are extended, the ongoing “planetaryization of the urban” is increasingly recognized as deeply imbricated with (and indeed inseparable from) processes of “planetary-scale computing” (Lefebvre 2014; Brenner 2014; Bratton 2014). If the 1990's was a decade obsessed with the possibility of transcending the limitations *of* physical space by means of digital technologies (as among others media theorist Lev Manovich has argued), it seems that in the first decades of the new millennia, this obsession has largely been replaced by an interest in computers and electronic information *in* space (Manovich 2006).

This theoretical ‘reterritorialization’ of the networked society finds material correspondence in the recent proliferation of digital- and smart city projects in many cities across

¹ One example of this shift is that the notion of a digital city today is no longer understood primarily in

the world. As suggested by the opening vignettes, city governments are today increasingly turning to digital entrepreneurs and large tech corporations for solutions to the pressing urban management and growth problems of the 21st century. The resulting urban programs often involve investments in both social and technical infrastructures— and are frequently couched in discourses of “technological solutionism” where the ubiquity of urban computing technologies and data flows are said to offer unprecedented opportunities to resolve complicated urban problems. As with the example of Rio de Janeiro’s urban control center, these solutions often propose the possibility of optimizing and reorganizing cities according to cybernetic logics of feedback and control (Halpern et al. 2013; Haque 2012; Morozov 2013). At the same time, we can see with the example of NYC Digital how such projects also contain a renewed emphasis on the value of cities as a locus of human interaction and creativity, understood to provide key inputs and sources of innovation in an economy increasingly centered around digital information.

How do we understand these emergent urban assemblages, “digital/nondigital imbrications,” and socio-spatial configurations that characterize the contemporary (digital) city (cf. Sassen 2008)? What are the specific relationships today between digital technologies, urban space and contemporary capitalism? These are some of the broad questions that have inspired the writing of this thesis. From the perspective of established urban theory, some have argued that the urban has increasingly become a “strategic site” and “new frontier” for a Silicon Valley-driven political economy, especially after the great recession of 2008 (cf. Sassen 2001).² Put in other words, perhaps these projects constitute what some of the most regarded commentators on urban development might understand as the latest “spatial fix” of networked neoliberalism in need of expanding markets and territories, as well as infrastructures for facilitating an ever

² For example, data management companies such as Microsoft, IBM, Cisco, and Google, have increasingly positioned themselves as urban problem-solvers (See Luque-Ayala and Marvin 2015; McNeill 2015).

accelerating circulation of capital (cf. Harvey 2001)?

However, while I think this story can to a certain extent be explained through the established frameworks of critical urban theory – uneven development, the urban as a secondary circuit of capital, the urban as a consumptive spectacle, neoliberal urban entrepreneurialism etc. –these existing frameworks have limitations when it comes to allowing us to capture and interrogate with any level of detail the specific nature of these emergent imbrications of technology, capital, and urban space.³ Rather, stemming from a particular lineage of Marxist theorizations of geography and space most famously developed by David Harvey and Neil Smith, many of these inherited critical urban lenses might actually in their relative orthodoxy serve to obscure certain aspects such as the emergent imbrications of techno-capitalism and urbanization, and subsequently also hamper the development of new critical conceptions of contemporary forms of urbanism.

In a set of recent writings, urban theorists Neil Brenner and Christian Schmid have argued that that over the past decades “the form of urbanization has been radically reconfigured, a process that has seriously called into question the inherited cartographies that have long underpinned urban theory and research” (Brenner and Schmid 2012, 11). Processes of socio-spatial restructuring, intimately related to the transformations of global capitalism have, in their meaning, rendered some of the basic grammar of urban theory obsolete. Drawing on Marxist theorist Fredric Jameson, Brenner and Schmid therefore suggest an urgent need to develop new “cognitive map[s]” through which to decipher the emergent landscapes of urbanization under the conditions early twenty-first century capitalism, and thus lay the foundation for a reinvigorated critical urban theory (Urban Age, 749).⁴

This thesis represents one small contribution to this project of developing new cognitive

³ For examples of these different theories see Harvey 2006; Harvey 1989; Smith 2008.

⁴ For them, this project includes developing “new theoretical categories ... a new conceptual lexicon ... [and] boundary-exploding methodological strategies” (Brenner and Schmid 2012, 13)

maps for ‘finding our way’ around contemporary urban landscapes. Following the examples presented in this introduction, I will focus on how to approach and understand what appears to be a changing relationship between digital technologies, urbanization, and capitalist globalization. The purpose of developing such maps is to situate the landscapes of the digital city in relation to a larger totality constituted by globalized capital, as well as delineate how it might connect to more specific processes such as gentrification and securitization of urban space. More importantly, new maps should also allow us to better understand what forms of urban politics and sites of resistance that most effectively can help make this new urban landscape a more (and not less) egalitarian and democratic place to live.

In this thesis, I depart more specifically from a recent set of theoretical frameworks that have attempted to provide an alternative model of explaining this above outlined shifted towards an urban-centered digital economy. The gist of these frameworks, which have been forwarded by some of the most prominent scholars in the discipline of Geography, is that cities constitute creative and cognitive nodes in an economy increasingly driven by immaterial and knowledge-based innovation (Scott 2007; 2008; 2011; Thrift 2012; Wylie 2013). In what economic geography Allen Scott has referred to as Cognitive-Cultural Capitalism, urban territories become essential social factories that produce the main inputs and outputs in an economy centered around ideas, information, and affects. However, without much attribution, these frameworks have borrowed heavily both in concepts and in argument from an arguably more radical theoretical tradition: the (mostly) Italian school of post-Workerist thought. Many of the central figures within this tradition, which will be introduced more carefully introduced in section 5 of this thesis, have for decades been theorizing around the shifting character of the capitalist system using terms such as cognitive, immaterial, and biopolitical production (see Hardt & Negri 2000; 2009; Moulier-Boutang 2012; Vercellone 2007).

In this thesis, I argue for the importance of carefully interrogating this theoretical legacy that has so clearly inspired recent theorizations within Geography, in order to critically evaluate

its implications as basis for developing new cognitive maps for urban politics in the 21st century. In particular, I will trace the post-Workerist theorizations of cognitive capitalism back to a particular reading of an influential section of Karl Marx's notebooks (*Grundrisse*) known as the 'Fragment on Machines'. As I will argue, how this section has been read has had significant impact on the theories that have subsequently been inspired by it. Given what I identify as a set of problematic shortcomings in these influential readings of Marx's Fragment for thinking the contemporary metropolis, the purpose of this thesis is then to begin to outline the following question: how can we read Marx's Fragment in a way more adequate for theorizing contemporary urbanism?⁵

The method that I make use of in this thesis is a set of close readings of the primary text (Marx's Fragment on Machines), as well as wide set of texts that either reference or comment on this text or theories that have been based on it. In particular, I will make comparisons between the influential post-Workerist readings of the text, and a largely forgotten engagement with Marx's Fragment by the eminent urban theorist Henri Lefebvre. As I will show, in the latter reading we find potential for developing a spatially more sophisticated theory of the contemporary digital metropolis.

⁵ I take inspiration here from Paolo Virno, who has called for the need to develop a "fundamental critique of the fragment" (see page 24 in this thesis). However, I suggest here that is not just the Fragment itself that needs to be critically interrogated, but also the ways in which it has been read into theorizations of the present.

3. ACTUAL BEGINNINGS: INTERROGATING HARDT & NEGRI'S METROPOLIS

In *Commonwealth*, the third and final installment in their *Empire*-trilogy, Hardt & Negri make an important modification to their well-known diagnosis of the political, social, and economic landscape of struggle in the beginning of the 21st century. In *Empire*, they identified the primary terrain of struggle over increasingly immaterial, cognitive, and biopolitical forms of production largely with the decentered, smooth, and networked space of globalized 'Empire': "Empire is... really a non-place" (Hardt and Negri 2000, 190)).⁶ A decade later in *Commonwealth*, however, it is "the metropolis that has become the primary locus of biopolitical production" (Hardt and Negri 2009, 244).⁷

This metropolitanization of Hardt & Negri's thinking is perhaps not so surprising given the growing recognition that "the so-called 'information society' is an increasingly urban society" (Graham 2004, 16). If the 1990's discourse around 'the rise of the networked society' was, as we saw in the introduction, characterized by cyberspatial "dreams of transcendence" (to which Hardt & Negri's *Empire* posed a form of internal critique), it seems that the following decade delivered the sobering insight that the 'digital age' did not so much lead to the

⁶ And as they suggest in *Empire*, "[t]he struggles to contest and subvert Empire, as well as those to construct a real alternative, will thus take place on the imperial terrain itself" (Hardt and Negri 2000, xv)

⁷ Biopolitical production, they define In *Empire*, as "the production of social life itself, in which the economic, the political, and the cultural increasingly overlap and invest one another." (Hardt & Negri 2000,xii)

abandonment or obsolescence of the city as a focal point for economic, social and political processes, but rather to its complex remediation (Ibid).⁸

While instituting an important shift in geographical imaginary from the supposedly smooth space of the informational network to the irregular and differentiated texture of the urban, Hardt & Negri's theorization of the contemporary metropolis is one that continues to take its departure in an already assumed historical transition to a new era of capitalist development defined by the hegemony of networked, cognitive, and immaterial production.⁹ Building on their notion of immaterial labor as the hegemonic figure of this new form of capitalism, Hardt & Negri in *Commonwealth* construct an image of the contemporary city as being transformed in accordance with the needs and characteristics of this new form and figure of production.¹⁰ "Biopolitical production", they suggest, "is transforming the city, creating a new metropolitan form" (Hardt & Negri 2009, 251). The centrality of the metropolis in this new form of capitalism is primarily as a technical and social infrastructure that supports "biopolitical entrepreneur[ship]" of immaterial and cognitive workers (Ibid, 298).¹¹ The metropolis here functions as an urban "common" of living knowledge (languages, codes, and affects; networks of communication and modes of cooperation), which serves as the most important foundation and

⁸ For examples of the first position, see (Negroponte 1995; Mitchell 1996; Castells 2010). For the second, see (Sassen 2001; Graham 2004; Barnes 2010). Some argue that this can be explained by the shift from stationary to increasingly mobile or post-desktop technologies (see for example de Souza e Silva 2006; Farman 2012); whereas others highlight the ubiquity of digital hardware and software in urban space, and how they have become central to the functioning of pretty much any urban infrastructure (Thrift and French 2002; Crang and Graham 2007).

⁹ Thus building on and extending, rather than revising, the position they established in *Empire*.

¹⁰ See for example page 29, where they articulate how it is this Italian tradition of the 'general intellect' that constitutes the basis for their model of production (it should be added, building also on the French tradition, especially the work of Foucault and Deleuze & Guattari). The terms biopolitical and immaterial production are used somewhat interchangeably by Hardt & Negri to represent this new paradigm of production.

raw material for an immaterial or biopolitical economy, as well as the primary output of its production.

This metropolis, they argue, is also characterized by a growing antagonism between the socialized productivity of immaterial labor, and the vampire-like value extractions of capital. No longer able to directly organize the production process (this is one of the central aspects of their theorization of a shift from material to immaterial labor), capital is increasingly becoming a barrier to, rather than facilitator of, the productive capacities of this emergent metropolitan form. On the one hand then, the metropolis is now the primary terrain for the immaterial and networked production of social life (immaterial or biopolitical production no longer centers on the production of commodities, but on the production of life itself), and on the other hand, it functions as an apparatus of capture that facilitates the increasingly parasitic practices of value extraction from these collective and social forms of production. Immanent to Hardt & Negri's metropolis are thus already the (im)material, and political conditions for a post-capitalist society, realizable through a liberation of the growing capacities for social(ly networked) production in and of common(s) from the regressive force of capital. In other words, this biopolitical metropolis appears in *Commonwealth* as the primary landscape of transition "through" which to get "beyond capital" (Hardt and Negri 2000; 2009)

However, in its focus on the activities and productivity of the latest and most technologically advanced forms of capitalist development as the most significant and strategic sites of post-capitalist potentiality, Hardt & Negri's theorization of a biopolitical metropolis poses a teleological and somewhat developmentalist narrative of transformation. I argue in this thesis that their theory thus runs the risk of becoming an apologetic for, rather than challenge to, the contemporary urban frontiers of techno-capitalism.¹² In *Commonwealth*, they introduce a

¹² See for example, how they propose a model of distributed urban entrepreneurship as holding the key to a post-capitalist transition (306)

metropolitan reformist program aimed at strengthening the urban multitudes' capacities for biopolitical production that shows striking similarities with those contemporary technology-driven urban revitalization projects exemplified in the vignettes.¹³ For Hardt & Negri, such developments are more or less embraced as they seem to represent the path towards a post-capitalist transition by pushing the antagonism between immaterial labor and capital into a higher level.

In this thesis, I seek to interrogate and problematize this position on the hegemony of immaterial/biopolitical production as a basis for a critical theorization of the contemporary metropolis. I do this by turning to the one of the most important historical reference points that undergirds Hardt & Negri's urban transition argument: Karl Marx' famous so called 'Fragment on Machines'. An enigmatic piece of writing from Marx's notebooks, the Fragment constitutes a foundational part and common reference point for a set of influential theories and debates around contemporary capitalism that goes under the labels of post-Workerism and Accelerationism.¹⁴ The Fragment is, however, a text characterized by an ambiguity, both thematically and structurally, lending itself to a multiplicity of readings.¹⁵ In post-Workerist and Accelerationist engagements with the Fragment, this ambiguity is often read in tendential and teleological terms, where the seemingly dystopic scenario of a society dominated by machines outlined in the first part of the text is understood as providing the necessary material, social, and political pre-conditions for a transition to a post-capitalist society outlined in the second part.

¹³ Compare Hardt & Negri 2009, 306-311, with NYC Digital, briefly outlined in one of the vignettes.

¹⁴ In the Fragment, Marx both describes a tendency towards increased machinic automation in the production process, but also how this leads the production process to come under the control of a "general intellect", a form of "general social knowledge" which increasingly comes to replace human labor time as the "great well-spring of wealth" in society. It is especially this latter notion of the general intellect that has been central to post-Workerist theorizations.

¹⁵ Paolo Virno has, for example, called 'the fragment' "a litmus test", implying that it tends to change color depending on the context in which it is referenced.

By reading the Fragment as a form of revolutionary theory of post-industrial society avant la lettre, however, post-Workerists and Accelerationists problematically pose a form of singular global trajectory through which all spaces and peoples must (or already have) pass(ed) in order to obtain a revolutionary potential adequate for the information age.^{16, 17, 18} This reading downplays the relational coexistence between a multiplicity of socio-spatial and socio-technical trajectories, instead incorporating such multiplicities under one singular tendency, reproducing a historical and geographical imaginary that John Law has aptly called the “one-world world” (2011). In this thesis, I argue that this renders a highly problematic starting point for thinking and theorizing the uneven and highly differentiated socio-spatial landscape of the contemporary

¹⁶ Cf. Massey (2005). These are propositions that, as Massey argues, “turn geography into history, space into time. And this again has social and political effects. It says that Moçambique and Nicaragua are not really different from ‘us’. We are not to imagine them as having their own trajectories, their own particular histories, and potential for their own, perhaps different, futures. They are not recognized as coeval others. They are merely at an earlier stage in the one and only narrative it is possible to tell. That cosmology of ‘only one narrative’ obliterates the multiplicities, the contemporaneous heterogeneities of space. It reduces simultaneous coexistence to place in the historical queue.” (Massey 2005, 5)

¹⁷ It is important to note here that Hardt & Negri themselves argue against any crude developmentalist model of historical stages of development as an explanation for geographical differentiation (Hardt & Negri 2000, 288). Instead, they suggest, these are “lines of the new global hierarchy of production” where “[t]he economic stages are thus present all present at once, merged into a hybrid, composite economy that varies not in kind but in degree across the globe.” (Ibid, 288; 289). However, at the same time, their work (as well that of many of their Italian post-Workerist colleagues on which they draw) departs precisely from a highly situated and tendential analysis of the new informational and networked economy as the ‘highest’ or ‘most advanced’ sector of production, which in turn comes to provide the empirical (and ontological) model for Empire. There is for Hardt & Negri no outside to this global informational and biopolitical sphere; everything, including “real alternatives and the potentials for liberation ...exist *within* Empire” (Ibid, 46, their emphasis). Accordingly, the forms of political subjectivities and resistance; the new constitutive and potentially autonomous power of the multitude to which they attach revolutionary potential, comes to be defined through this global networked model of production. The only way is “through and beyond Empire” (ibid, xv). At the same time, they dismiss and residualize localized forms of resistance in the era of Empire, relying here what is arguably a simplified/crude geographical imaginary that separates the local from the global through (Ibid, 46-47).

¹⁸ The problematic nature of this revolutionary path of “through and beyond” has been articulated by several critics of the recent and in some ways more controversial reading of the ‘fragment’ as part of the theoretical fad known as ‘accelerationism’ (see, for example, Noys 2014). From the accelerationists viewpoint, the fragment constitutes a political call for ‘technological acceleration’, suggesting in a joyfully nihilistic fashion that the crucial revolutionary problematic of today is that we have not yet become machinic enough (see Srnicek and Williams 2013; Mackay and Avanessian 2014).

(digitalizing) metropolis, which as so many have argued, is constituted precisely through its contemporaneous multiplicity of potentialities and trajectories, “as a simultaneity of stories-so-far” (Massey 2005, 9; see also Massey 2007; Roy 2009).

Against a sequential reading of the fragment, which lays the basis for theories of the cognitive metropolis that have become increasingly common also within the discipline of Geography as of late (see for example Scott 2008, 2011, Thrift 2012), I propose to instead refract the fragment’s ambiguity through the lens of space. Here I take inspiration from Doreen Massey’s three-fold conceptualization of space as relational, heterogeneous, and always becoming (Massey 2005).¹⁹ By reading the Fragment spatially, we thus start from an anti-teleological premise, insisting on the co-existence of multiple (and often contradictory) trajectories, and on spatial process such as urbanization as contingent, heterogeneous, and struggled over, thus always remaining open to multiple different outcomes. That is, instead of posing machinic subsumption as an historical precondition for the emergence of an economy centered on social capacities for immaterial and cognitive production, I will suggest that this introduction of the problem of space into *theory of the cognitive metropolis* will be disruptive of some of its central propositions.²⁰

In order to further develop this spatial critique, I turn to one of the primary critical theorists of space, Henri Lefebvre, and his reading of the Fragment in the often overlooked

¹⁹ Massey’s understanding of space is based on the following three propositions: “[f]irst, that we recognize space as the production of interrelations; as constituted through interactions, from the immensity of the global to the intimately tiny... *Second*, that we understand space as the sphere of the possibility of the existence of multiplicity in the sense of contemporaneous plurality; as the sphere in which distinct trajectories coexist; as the sphere therefore of coexisting heterogeneity. Without space, no multiplicity; without multiplicity, no space. ... *Third*, that we recognize space as always under construction. Precisely because space on this reading is a product of relations-between, relations which are necessarily embedded material practices which have to be carried out, it is always in the process of being made. It is never finished; never closed.” (Massey 2005, 9)

²⁰ I here draw on David Harvey, who in describing the contribution of geographical theory to the theorization of late capitalism has suggested that “[g]eographical knowledge tends to get shoved aside, marginalized, or even dismissed because it poses very awkward and even disruptive problems for conventional forms of disciplinary wisdom... [and] that the insertion of space into any social theory (including that generally dubbed Marxist) is disruptive of its central propositions.” (Harvey 2002, 181).

book *La Pensée Marxiste et la Ville* (Marxist Thought and the City, 1973). In *La Pensée*, we see an ambiguity around the development anticipated in the Fragment, which for Lefebvre is intimately connected to the technocratization of the urban, the disintegration and disappearance of work, and the increasing confinement of urban populations under regimes of automation, calculation and control. Lefebvre's pessimistic reading of the Fragment – which lifts the question of the transformation of machinery (and increasingly entire urban landscapes) in accordance with a capitalist logic of exploitation and extraction and cybernetic logic of control – seems to pick up on the ambiguous aspects of the Fragment and suggests the possibility of multiple or indeterminate outcomes of a machinic society. What Lefebvre offers, I suggest, is a spatial reading of the Fragment, which constitutes an important challenge to the optimistic and teleological post-Workerist engagements with this text. Reading the Fragment *spatially* rather than *temporally* is thus identified as a valuable point of departure for developing a contemporary urban reading/critique of the Fragment, and by extension, a more solid ground for developing new cognitive maps for the cities of the 21st century.

4. ON THE AMBIGUITY OF MARX'S FRAGMENT ON MACHINES

In the *Grundrisse*, a collection of notebooks written in the late 1850's, Karl Marx attempts a skeletal outlining of his larger critique of political economy and of capitalism as world system. Towards the end of these notebooks, Marx introduces a set of strangely prescient ideas around the development of automated machines and the growing importance of distributed forms of intelligence. This section, famously referred to as the 'Fragment on Machines,' is one of the most cited and referenced parts of the *Grundrisse*, and a text that has come to figure as a key part of a wide-ranging set of theoretical arguments and debates on the role of science and technology in capitalism.²¹ While machinery and science are discussed on numerous other places in his writings (such as in the long 15th chapter on machinery in *Capital* Vol.1), perhaps nowhere else does Marx reach the same speculative heights on the topic as in the Fragment.

A careful reading of the Fragment suggests that it would be more accurate to speak of Marx's fragments on machines. For the text constitutes less a unified development of a singular idea or thesis than a set of parallel or dialectical elaborations on different potentialities inherent in a by Marx identified tendency towards the increasing importance of machinery and science in capitalist production. The Fragment, therefore, can be divided into two main sections; each of which develop rather different scenarios for the coming machinic age anticipated by Marx; one dystopic and gloomy, and one utopian and revolutionary.

²¹ As already suggested, the 'Fragment' constitutes a central reference point for both the post-Workerist tradition (see Keucheyan 2013), as well as for the more recent heretical and nihilistic school of contemporary thought known as Accelerationism (Mackay and Avanessian 2014). But the 'Fragment' is also referenced and discussed (to give a few examples); as a key text by Ernest Mandel in his *Late Capitalism* (Mandel 1972); as a basis for David Harvey's discussion on fixed capital (and subsequently the spatial fix) in his opus *Limits to Capital* (1982); as part of the great chapter on the capitalist machine in Deleuze & Guattari's *Anti-Oedipus* (1972), and in Henri Lefebvre's *La Pensée Marxiste et La Ville* (1972) and *The Survival of Capitalism* (1973) which both led up to his major work on the *Production of Space* (1974).

Delineating the ambiguity between these two parallel scenarios provides an important starting point for interrogating the ways in which the fragment has been read into the contemporary moment, as well as how it might be read differently.

4.1 *The Fragment as an outline of a Machinic Dystopia*

In the first section of the Fragment (roughly constituted by pages 690-699),²² Marx opens with a discussion on the development of fixed capital from simple tools or instruments of labor into large-scale forms of machinery.²³ The “culmination” of this process, Marx suggests, is the “automatic system of machinery”, which constitutes fixed capital in its “most adequate form”.²⁴ This adequacy stems more specifically from the fact that while dramatically increasing the productive capacities, automated machinery at the same time reduces the role and autonomous power of living labor in the production process, thereby increasing both the potential profitability and power of capital. The skills and “virtuosity” that were once the exclusive property of workers is now increasingly reconstituted in the machine while “[t]he workers activity, reduced to a mere abstraction of activity, is determined on all sides by the movement of the machinery, and not the opposite” (693).²⁵ Rather than animating production, living labor is

²² Page numbers refer to the 1993 Penguin Classic edition. (Marx 1993)

²³ Fixed capital can in the Marxian vocabulary be understood simply as means or instruments of labor used in capitalist surplus production. As David Harvey importantly points out, “since capital is defined as ‘value in motion’, it follows that that fixed capital must also be so regarded. Fixed capital is not a thing but a process of circulation of capital through the use of material objects, such as machines.” (Limits to Capital, 205). It is thus only as part of a capitalist production/valorization process that a machine or tool constitutes fixed capital. Marx in the fragment distinguish between pre-existing instruments of production which become incorporated into the production process, and machinery which is the “form posited by capital itself and corresponding to it.” (692)

²⁴ This transformation, Marx argues “is not an accidental moment of capital, but is rather the historical reshaping of the traditional, inherited means of labour into a form adequate to capital.” (694)

²⁵ Importantly here, the (scientific) knowledge that animates and organizes this machinic production, Marx suggests, “does not exist in the worker’s consciousness, but rather acts upon him [sic] through the machine as an alien power, as the power of the machine itself” (693).

increasingly downgraded to a diminishing moment within the larger production process.

Through the development of the machinic form, “capital [effectively] absorbs labor into itself,” making workers a “mere living accessory” to a system “whose unity exists not in the living workers, but rather in the living (active) machinery, which confronts his individual, insignificant doings as a mighty organism” (693).

The machinic tendency Marx identifies in this first part of the Fragment implies the increased subsumption of the entire “process of social life” to a capitalist regime of scientifically measured control and automated machinery.²⁶ Posited by capital as a reflection of its own form, the machine comes to constitute a physical crystallization of the social division of labor (both presupposed and re-imposed by its functioning), blurring distinctions between forces and relations of production.²⁷ The more this machinery expands, the more it seems to turn into an externally compelling and self-perpetuating force that confronts workers as an “alien power”, serving to reproduce these relations and divisions of production at an ever-expanding scale.²⁸ Marx here seems to outline the becoming of an accursed machinic system, residing less in the individual machine than in the increasing interconnectedness of machinery and workers into a larger productive capitalist totality.²⁹ This ‘mighty organism’, animated by the “technological

²⁶ Cf. discussion on real subsumption in Marx, p. xx

²⁷ As Marx argues, the automated machine emerges to replace human labor only after a division of labor has already “reduced “workers’ operations into more and more mechanical ones, so that at a certain point a mechanism can step into their places.” (704)

²⁸ Marx writes: “the greater the scale on which fixed capital develops... the more does the continuity of the production process ... become an externally compelling condition for the mode of production founded on capital.” (703). In *Limits to Capital*, David Harvey reads this passage to suggest that “[t]he more capital circulates in fixed form, the more the system of production and consumption is locked into specific activities geared to the realization of fixed capital.” (LTC, 220). This passage then outlines the contradiction between fixed and circulating capital that will become the foundation for Harvey’s theory of the spatial fix. But we could also read this claim in relation to Henri Lefebvre’s argument in the *Survival of Capitalism* about how the production of space serves as primary means for reproducing the relations of production.

²⁹ As Marx argues, “the automatic [machine]... alone transforms machinery into a system”(692)

application of science”, takes on an agency and unity of its own, compelling and transforming everything it encounters into the service of its calculated demands for surplus extraction.

4.2 *The Fragment as a path to Socialist Utopia*

The start of the second section (pages ~700-712) corresponds with a shift in notebooks. Here it is almost as if Marx, in this momentary break brought on by the running out of pages, realizes that he is about to paint himself into a dystopic corner and sets out to rethink the scenario of a tightening grip of capital accomplished through a machinic metamorphosis. He begins by reopening the chasm between the machine and the social relation of capital, which he had sentences earlier implied was closing, reiterating the non-reducibility of the machine’s use value to the capital relation. For “while machinery is the most appropriate form of the use value of fixed capital” he writes, “it does not at all follow that therefore subsumption under the social relation of capital is the most appropriate and ultimate social relation of production for the application of machinery.”(699)³⁰ Rather, Marx suggests through a dialectical turn of events, in its tendency towards the development of an automated machinery of production, capital is in fact working “towards its own dissolution as the form dominating production”(700). Marx builds this assertion on the observation that through the development of automated systems of machinery, the production of “real wealth” comes to depend less and less on the expenditure of human labor time, and more “on the general state of science and on the progress of technology, or the application of this science to production”(705). In other words, through this tendency, it is increasingly society’s capacity to engineer new and more advanced machinery, and not the deployment of more workers that drives increased productivity.

³⁰ More specifically, Marx writes that “while capital gives itself its adequate form as use value within the production process only in the form of machinery and other material manifestations of fixed capital, such as railways etc. (to which we shall return later), this in no way means that this use value -- machinery as such -- is capital, or that its existence as machinery is identical with its existence as capital; any more than gold would cease to have use value as gold if it were no longer *money*. Machinery does not lose its use value as soon as it ceases to be capital.”(699)

At the same time, however, capital continues to posit human labor time as the source and unit of measure of value, developing machinic forces only in order to appropriate more surplus value (/time).³¹ That is, capital deploys machinery not to remove labor from the production process entirely, but rather intensify the rate of exploitation by increasing the ratio surplus to necessary labor. The contradiction here, which Marx captures in his famous *falling rate of profit* argument, is that capital achieves an intensified rate of exploitation only by replacing the source of value – living labor – with the dead labor congealed in machines. Thus, the capitalist value form appears as an increasingly “miserable foundation” for the production of wealth in the face of the enormous productive capacities inherent to these large-scale and automated forms of machinery. In fact, the development of this machinic system constitutes, according to Marx, “the material conditions to blow this foundation sky-high.” (706). Based on the recognition of this “moving contradiction” inherent in the tendency towards machination, Marx draws the conclusion that what must follow is an inevitable and irresolvable crisis in the capitalist law of value and the breakdown of “production based on exchange value,” and so of the capitalist mode of production at large.³²

As a complement to his break-down theory of the capitalist mode of production, Marx also provides a positive, utopian vision for a post-capitalist society emerging on the back of this increasingly machinic society: as workers are liberated from the toil of manual labor, they are simultaneously inserted into the production process as “conscious linkages” and supervisors, initiating a qualitative transformation of labor from a primarily physical to an intellectual, social,

³¹ One should keep in mind here the important distinction between value and wealth in Marx, see footnote 49.

³² Marx suggests here that “ [a]s soon as labour in the direct form has ceased to be the great well-spring of wealth, labour time ceases and must cease to be its measure, and hence exchange value [must cease to be the measure] of use value.” (705) I return to this issue below on page xx, suggesting that this crisis theory might potentially be challenged on several levels by Marx’s subsequent work on relative surplus value in *Capital* vol.1.

and cognitive activity. Through this transformation, workers become part what Marx calls a “general intellect”, a distributed intelligence and living form of social knowledge that constitutes the most important resource for the development of automated machinic systems.³³ Marx suggests this in a famous passage:

Nature builds no machines, no locomotives, railways, electric telegraphs, self-acting mules etc.

These are products of human industry; natural material transformed into organs of the human

will over nature, or of human participation in nature. They are organs of the human brain,

created by the human hand; the power of knowledge, objectified. The development of fixed

capital indicates to what degree general social knowledge has become a direct force of

production, and to what degree, hence, the conditions of the process of social life itself have

come under the control of the general intellect and been transformed in accordance with it. (706)

The subsumption of society to a machinic system is here posited by Marx not as a peril to workers’ power, but rather as a positive tendency indicating the transformation of social life into new and higher states of collective intelligence and subjectivity. As ‘general social knowledge’ replaces human labor time as the hegemonic source of wealth, it is no longer “theft of alien labour time”, but rather the “development of the social individual which appears as the great foundation-stone of production and of wealth” (705). The ‘mighty organism’ that in the first part of the Fragment appeared as a diabolic capitalist machine, in the second part reveals itself instead as the emancipatory process that will deliver the material and social basis for a post-capitalist society of plenty.

Pervading the Fragment is thus, I want to argue, an indeterminacy of the dialectic where the same tendency towards machinic automation is described as containing the potentiality for two radically different outcomes –either a machinic nightmare; or a dawning socialist utopia

³³ “The accumulation of knowledge and of skill, of the general productive forces of the social brains, is thus absorbed into capital, as opposed to labour, and hence appears as an attribute of capital, and more specifically of *fixed capital*, in so far as it enters into the production process as a means of production proper.” (694)

based on the collective productivity of free individuals. This ambiguous aspect of the Fragment has, however, been downplayed in many of the contemporary engagements with this text in favor of a tendential and sequential reading that poses the machinic age outlined in the first part as the truly (and only) revolutionary path leading to the collapse of capitalism outlined in the second part of the text. The obvious problem with this latter reading is that it reifies the machinic tendency manifested by the development of more advanced technologies and knowledge-based work forms as the materialization and forthcoming realization of Marx's thesis on the forthcoming collapse of capitalism (see Wright 2002; Moulier-Boutang 2012). Here, the rapid proliferation of technologies are interpreted simply as a victorious sign of capitalism's imminent demise, without however, providing any specific details as to when, or how, this demise will actually take place.

To highlight this problem, we can turn to Paolo Virno, who in the 1990's wrote about "the full factual realization of the tendencies described in the *Grundrisse*, without, however, any emancipatory— or even merely conflictual—reversal" (Virno 1996, 267, authors emphasis). Virno argued that the general intellect increasingly materialized itself as sociological reality, with technological and scientific innovation taking center stage in the production process, in turn diminishing the importance of labor time for the production of wealth. This tendency, however, neither lead to the end of the exploitation of human labor in the production process nor to the collapse of capitalism. Rather, the development of more advanced machinery, especially in the form of computers and communication networks, instead facilitated new modes of abstraction and calculation (financial industries in particular) that absorbed and stabilized the general intellect as part of the existing mode of production. This situation necessitated a renewed project of analyzing an emergent form of capitalism, but also a "fundamental critique of the fragment" in order to locate the emerging lines of conflictuality and contestation in this new formation (267). While I fully agree with Virno on this last point, I want to suggest that we must critique not only the Fragment itself, but also the ways that this particular text has been read into and

become a central part of theorizations of our contemporary era. Next we will therefore turn to the tradition of post-Workerism, and its tendential reading of the Fragment as one of the tradition's most important reference points.

5. POST-WORKERISM AND MARX'S FRAGMENT

Perhaps best known to contemporary readers through the work of Hardt & Negri, post-Workerism is a rather heterogeneous school of thought constituted by a group of theorists that primarily share the common influence of the theoretical and political innovations emerging from the Italian post-WWII Marxist traditions of *Operaismo* ('Workerism') and *Autonomia* ('Autonomism').³⁴ As suggested in the introduction, Hardt and Negri's theorization of the contemporary metropolis must be understood in the context of this broader tradition. In this section, I outline the central ways in which Marx's Fragment figures as a key reference point for the post-Workerist tradition, and its theorizations of present-day capitalism.³⁵ While recognizing the heterogeneity of post-Workerism, I am here not so interested in delineating specific differences between theorists belonging to this tradition (for this kind of work, see for example Steve Wright's *Storming Heaven*, an excellent historical overview of *Operaismo* and *Autonomia*), but rather to describe some of the ground they hold in common, with the Fragment constituting, as I will show, an important part of this ground.

³⁴ From the inception of workerism (*operaismo*) in the late 1950's as critique of communist party vanguardism, to the collapse of the autonomist movement in the late 1970's following the kidnapping and assassination of the Italian prime minister Aldo Moro (see Wright 2002), this was an era that as Michael Hardt has suggested "constituted a kind of laboratory for experimentation in new forms of political thinking" generative both a wealth of theoretical insights but also an equal number of political defeats (Virno and Hardt 2006, 1).

³⁵ It is interesting to note here that the fragment was translated into Italian and published in the fourth issue of *Quaderni Rossi*, the first workerist journal started in 1961 by Raniero Panzieri. Preceding the publication of the 'Fragment', Panzieri and his colleague Roman Alquati developed sophisticated critiques of the objectivist understanding of technology common in socialist and communist circles at the time, critiques that became overshadowed by the rather different approach to technology contained in the fragment (see Alquati 1961). I will return to these critiques below.

From the viewpoint of post-Workerism, contemporary capitalism is broadly characterized by a historical shift from material production to what different theorists refer to as immaterial, cognitive or biopolitical forms of production. In each of these theoretical articulations (to be expanded upon below), there is a specific focus on what is understood as the replacement of (manual) human labor with living social knowledge as the hegemonic form of capitalist valorisation. Such theorizations are in large part derived through a method that Massimiliano Tomba (2007) has argued is common to many post-Workerist theorists:

The method was, and is, the same: always and come what may, identifying some ‘tendency’, focused at its most advanced point upon a sector which assumes strategic significance, and upon which a new political ‘wager’ is staked. The whole theoretical system is thus politically geared towards new figures, declared hegemonic in the process. These figures are said to express new forms of conflictuality on which to place a new bet.”

As prominent Workerist scholar Steve Wright has argued, this category and method of the ‘tendency’ is derived from Antonio Negri’s extremely influential reading of the *Grundrisse* (and the *Fragment* in particular):³⁶

Central to Negri’s reading of the *Grundrisse* was his appropriation of the category tendency, by which he understood the historical unfolding of capital’s immanent contradictions as social antagonisms. The tendency was ‘in no sense a necessary and ineluctable law governing reality’, but rather ‘a general schema’ that ‘defines a method, an orientation, a direction for mass political action’ (ibid.: 125). (Wright, 139)”

This method of the tendency then, has generally led post-Workerist theorists to focus on what they conceive of as the latest and highest points of capitalist development (and figures at the center of such development) as constituting the most important strategic point of resistance. In the following section I will delineate more specifically three interrelated ways in which the

³⁶ The tendency in Marx’s *Grundrisse*: “The increase of the productive force of labor and the greatest possible negation of necessary labor is the necessary tendency of capital, as we have seen. The transformation of the means of labor into machinery is the realization of this tendency.” (693)

tendential reading of the Fragment figures as the basis for the post-Workerist characterization of contemporary capitalism. First, I will show how the Fragment functions as the ground for establishing a periodization of the capitalist mode of production, including what is seen as its latest phase, here referred to under the umbrella term of cognitive capitalism. Secondly, I will point to how the Fragment provides the basis for a theory of the contemporary primacy of social cooperation, and its autonomy from the organizational capacities of capital. And finally, I will argue that a tendential reading of the Fragment constitutes a key part of post-Workerist theories of capitalist crisis. In all three cases, I will critically interrogate the reductionist aspects of such tendential theorizations derived from Marx's Fragment, pointing towards the importance of relational and contextually grounded forms of analysis that situate specific tendencies within the broader and more complex landscapes of social, political and economic processes from which they derive.

5.1 *The Fragment and The Era of Cognitive Capitalism*

First, I want to point the role that a tendential reading of the Fragment plays for the post-Workerist historical periodization of capitalism. This periodization provides the basis for the argument that we have entered a third era or phase of capitalism often referred to as cognitive capitalism. For Carlo Vercellone (2007), one of the main theorists of cognitive capitalism, this periodization is built more specifically on a synthetic reading of Marx's notions of *formal subsumption*, *real subsumption* and the *general intellect*. These concepts, which in Marx reflect different levels of subsumption of labor to the capital relation (with each level of subsumption corresponding to a specific organizational mode of capitalist production), are conceived by Vercellone as historical stages of capitalist development.³⁷ Formal and real subsumption are

³⁷ According to the workerist and post-workerist tradition, the emergence of a new form of subsumption of labor to capital is driven not by some inherent progressive force of capitalism but rather by workers struggle. For post-Workerists it is, in other words, the struggle of workers against capitalist domination that prompted the technological and organizational transformations that led to the real subsumption of labor, and it is similarly workers' struggle against the regimented organization of labor under Fordist

concepts discussed by Marx particularly in the unpublished 6th chapter of *Capital*, whereas the idea of the general intellect is, as we now know, taken from the Fragment on Machines.³⁸ While the latter is of particular interest here, we must begin by briefly introducing the notions of formal and real subsumption in order to grasp the nature of this argument.

Formal subsumption designates the incorporation of laboring practices and subjects under the capitalist valorization process, often through what Marx calls primitive or original accumulation. Under formal subsumption, the production process is still (at least in part) organized and managed by the workers themselves, while capital merely takes hold of this production ‘formally’ through ownership of the means of production and mechanisms such as the wage relation. Capital is able to accumulate surplus by extending the working day beyond what is socially necessary for the reproduction of workers. Formal subsumption is thus primarily extensive, that is, it consists of subsuming more workers/extending the absolute number of hours worked, and is closely related to the notion of absolute surplus value[□].³⁹

Real subsumption, by contrast, is a function of an industrialized form of capitalism and involves subsuming the majority of labor under the direct organizational and technological supervision of capital, driving a more intentional and stratified division of labor. Real subsumption is characterized by a reduction from complex to simple labor; an increased domination of the living labor of workers by the dead labor in machines – closely related to the image that Marx draws of a machinic society in the first part of the ‘fragment; and by the retention of intellectual and knowledge-production within a small managerial portion of the workforce (Vercellone 2007, 15f). Real subsumption is thus intensive (it functions by increasing

industrialism that forced the crisis of this model of real subsumption, and pushed for the subsequent emergence of cognitive capitalism.

³⁸ See: Results of the Direct Production Process (Marx 1864)

³⁹ On absolute surplus value, see p 30. An often used example of formal subsumption is the so called ‘putting-out system’ common under early days of capitalism, where capitalists would supply workers with tools and materials to their homes and then pick up the finished products for sale (giving rise to what became known as the cottage industries).

the rate rather than absolute amount of exploitation), and relates primarily to the notion of relative surplus value in Marx.⁴⁰

Against this background, the emergence of the ‘general intellect’ is suggested by post-Workerists as heralding a transformation (or third form) of subsumption related to the historical emergence of cognitive capitalism (Vercellone 2007). The ‘general intellect’ is, as we have seen, a moment described by Marx in the Fragment when “general social knowledge” becomes a direct and increasingly dominant force in capitalist production. This happens as a consequence of the tendency towards increasing machinic automation and the growing importance of science to the production process. The general intellect is, in the post-Workerist reading, understood as collective or distributed intelligence constituted by the social cooperation and social practice of the population at large. Due to its immaterial and social character, the general intellect, unlike factory labor, is said to stand outside the direct organizational control of capitalists. It thereby effectively generates a break with (Vercellone), or a deepening and generalized crisis of (Hardt & Negri), the real subsumption of labor characteristic of industrial/Fordist production. This third era of capitalism is thus characterized by an increasing autonomy of socialized knowledge production vis-à-vis direct capitalist control, leading some to argue that as a consequence, capital is in fact forced to return to a modified form of formal subsumption of labor and to “mercantile and financial mechanisms of accumulation”. (Vercellone 2007, 16) A tendential reading of the Fragment, as we see here, provides an important part of the theoretical armament used by post-Workerists in their reconceptualization of post-industrial/information society as cognitive capitalism.

With the concept of cognitive capitalism finding its way into the discipline of geography in recent years – Allen J. Scott has for example mobilized this concept to explain the emergent characteristic of 21st century urban economic geography (Scott 2007; Scott 2008; Scott 2011) –

⁴⁰ On relative surplus value, see p. 30

clarifying the underlying roots of this periodization argument in a tendential reading of the Fragment becomes essential.

The Fragment also lays the foundation for post-Workerist theories on the primacy of cognitive cooperation, and capitalist crisis. But before elaborating these subsequent points, I want to briefly note here that this historicist and tendential reading of the Fragment remains a matter of debate, even within post-Workerist circles. Sandro Mezzadra has, for example, cautioned against such readings, drawing on his work on migration and border struggles to argue that:

[a] careful analysis of migrant labour challenges this way of reading the history and present of capitalism, showing the coexistence of formal and real subsumption, of ‘immaterial’ and forced labour. This brings to the fore the structural nexus between the ‘new economy’ and new forms of ‘so-called primitive accumulation’, along with the new enclosures that this structural nexus entails. (Mezzadra 2011, 10)

For Mezzadra, each level of subsumption and the related organizational model of capitalist accumulation should not be seen as mutually exclusive or as sequentially eclipsing the form that preceded it. Rather, he argues, we must focus precisely on the co-existence of formal and real subsumption of labor under the emergence of cognitive capitalism without falling into any teleological narratives of one replacing another. We will return to this cautionary critique and how it articulates the importance paying more careful attention to the differential relation between production forms under contemporary capitalism.

5.2 *The Fragment as a theory of Cognitive Cooperation*

The fragment constitutes an important basis for the thesis that Alberto Toscano has called “the primacy of cooperation,” which posits “the autonomy of the cooperative capacities of living, immaterial labour from their expropriation and commoditization by informational

capitalism” (Toscano 2007, 75).⁴¹ This is a position that Hardt & Negri, together with Lazzarato, Vercellone and a number of post-Workerists, can all be said to in different ways subscribe to. In *Labor of Dionysus*, Toni Negri outlines this position more specifically:

Cooperation, or the association of [cyborg] producers, is posed independently of the organization capacity of capital; the cooperation and subjectivity of labor have found a point of contact outside of the machinations of capital. Capital becomes merely an apparatus of capture, a phantasm, an idol. Around it move radically autonomous processes of self-valorization that not only constitute an alternative basis of potential development but also actually represent a new constituent foundation. (Hardt and Negri 1994, 282; quoted in Caffentzis 2013, 77)

Negri’s position here is clearly inspired by his tendential reading of Marx’s *Fragment*, with a particular emphasis put on the second part of the text and its notion of the general intellect as the cooperation of free individuals. For after delineating what seems like an increasing peripheralization of human capacities from the production process in the first part of the *fragment*, Marx in the second part re-centers precisely on how this machinic tendency leads to the general development of the creative and innovative capacities of the social individual, which now constitutes a key to the production of wealth in a society filled with automated machinery.⁴² In the post-Workerist reading of the *Fragment*, the emergence of this higher form of productive sociality is intimately connected to the subsumption of social life to the technological networks

⁴¹ This position is perhaps best understood as building on and merging two ideas; on the one hand the idea, dating back to Mario Tronti on the primacy of working class struggle as the driver of the development of capitalism; and on the other hand, a reading of Marx’s *Fragment on Machines* that suggests shift towards knowledge, science and information becoming hegemonic to capitalist valorization.

⁴² For as he argues in the passage quoted above: “[n]ature builds not machines... [t]hey are organs of the human brain, created by the human hand; the power of knowledge, objectified” (Marx 1993, 706).

of automated machines.⁴³ But the emergent productivity of immaterial labor (based on social collaboration and communication) means that the production of wealth is now no longer tied to the theft of labor time, but rather to the further development of “free individualities” that can partake in such processes. This transformation in the post-Workerist reading is seen as the basis for an increasing autonomy of a process (of social life) which they argue cannot be controlled by capital in the same way that material factory labor can.

To see this position at work, we can return to Hardt & Negri’s theorization of the biopolitical metropolis. Immaterial production based on living social knowledge, they argue in *Commonwealth*, cannot not be easily confined to certain spaces and times (as was the case with factory production during the Fordist industrial era) but rather comes to spread “throughout the entire social territory”, increasingly overlapping with “the life of the city itself” (244).⁴⁴ Because it is comprised directly in collective urban sociality (rather than through the supervised encounter between machines and manual labor), immaterial and biopolitical forms of production enjoy an increasing autonomy from the direct organizational intervention of capital. As a result of this increasing autonomy capital is transformed from a profit-producing to a metropolitan rent-extracting machine, “which is [now] the only means by which [it] can capture the wealth created autonomously”(Hardt and Negri 2009, 251). The emerging form of the contemporary metropolis is characterized, for Hardt & Negri, as we have already seen, by the growing antagonism between these two different processes, on the one hand the metropolis as a site for the productivity of autonomous social labor, and on the other hand the metropolis as an

⁴³ As Marx states: [t]he development of fixed capital indicates ... to what degree ... the conditions of the process of social life itself have come under the control of the general intellect and been transformed in accordance with it”) (ibid 706).

⁴⁴ The term biopolitical production is used by Hardt & Negri to capture precisely how production increasingly overlaps with life itself, blurring the distinction between production and reproduction. As such, it attempts to broaden the categories of immaterial and cognitive production/labor commonly used within the post-Workerist tradition beyond the figure of the knowledge worker by drawing on Michel Foucault’s work on biopolitics and biopower. But we might also see here how this argument lies close to Marx’s point in the fragment on how capital increasingly comes to subsume the “process of social life” itself.

apparatus of rent extraction that facilitates the increasingly parasitic practices of capitalist valorization.

However, as Alberto Toscano has argued, we might question this optimistic position on a primacy of (urban) cognitive cooperation by pointing to “the forced nature of much social and cognitive interaction, of the manner in which the imperative ‘connect!’ might be experienced as a violent imposition on the part of capitalism rather than anything arising out of the desire of a putative multitude” (2007, 79-80) The recognition of this problematic leads Toscano to ask:

... in what sense we are justified in speaking simply of ‘capture’: are we not dealing with the incitement by capitalism of a simulacrum of self-valorization, an ideology of cooperation which would mistake a global constraint for a subjective initiative? Is cooperation really outside, or even relatively autonomous from, the self-valorization of capital? (2007, 80)

Toscano’s questioning of the increasing autonomy of cognitive and immaterial labor, and the suggestion that we must take seriously the notion of a machinic imperative to connect/communicate, resonates strongly with the bleak anticipations of a machinic society that Marx outlines in the first part of the Fragment.⁴⁵ While Marx primarily saw this in relation to the development of the factory space and the changing conditions of labor for factory workers, we might today make a similar point about the development of the networked metropolis and the conditions of an urban multitude, and through this question the claim that capital lacks the ability to organize immaterial forms of production. For what is the networked metropolis if not a machinic imperative to constantly connect?⁴⁶

⁴⁵ Here, ubiquitous automated technologies are not seen to increase, but rather reduce autonomy, with “workers activity... [increasingly] determined on all sides by the movement of the machinery, and not the opposite” (Marx 1993, 693).

⁴⁶ We can make this shift on the basis of Hardt & Negri’s claim that the metropolis has replaced the factory as the primary site of production. It is interesting here to draw a parallel to Deleuze’s discussion on the emergence of a control society, which constitutes a shift from a society that operates through confinement, to one that operates “through continuous control and instant communication.” In an interview with Toni Negri from 1990, Deleuze therefore warns against the universalization of communication and communication technologies, suggesting instead that what is needed “may be to create vacuoles of non-communication, circuit breakers, so we can elude control.” (Deleuze 1990)

5.3 *The Fragment as a Theory of Capitalist Crisis*

Finally, the Fragment provides a model of capitalist crisis commonly adopted by post-Workerist theorists built on the idea that capital (and its notion of value) is becoming an increasingly “miserable foundation” for production based on the general intelligence of a social network (Marx 1993, 705). “Capital is crisis”, Sandro Mezzadra for example writes in the introduction to *Crisis in the Global Economy*, a recent collection of post-Workerist commentaries on the crisis of 2008 (Fumagalli and Mezzadra 2010, 13). The crisis signals “the exhaustion of the progressive force of capital”, Carlo Vercellone adds in a later chapter of the same volume, an exhaustion which is seen to stem more specifically from the “irreconcilable character of cognitive capitalism with the social conditions at the root of the development of an economy founded on knowledge” (Vercellone 2010, 90).⁴⁷ This constitutes for Vercellone and other post-Workerists, the structural characteristics of the contemporary crisis; an indication of the growing contradiction between the emerging productiveness of the “general intellect”, and the increasingly exterior and parasitic mechanisms of capturing value from this social production through what Vercellone describes as the proliferation of rents. The latter is, for Vercellone, inevitably undermining the conditions of growth for the former by imposing artificial forms of scarcity and very real conditions of precarity as means of control over a social form of production that is seen to become increasingly autonomous from the standpoint of capital. (Vercellone). Importantly, this diagnosis suggests that capital is no longer a dynamic force that organizes the production of wealth (if only through exploitative and violent means), but is instead increasingly seen as a barrier standing in the way of the full realization of the autonomously productive capacities of a distributed and collective social intelligence.

This is a model of crisis that, as we can see, draws crucially on a tendency derived from Marx’s Fragment. It does so, we might propose, in at least two distinct ways. First, it suggest a

⁴⁷ Cognitive capitalism represents here, not a new stable form of accumulation, as much as a desperate attempt to reinstate an appearance of cohesion and stability to an overall system that is becoming increasingly fragmented and unstable.

tendency towards a generalized antagonism between the autonomous productive capacities of the contemporary general intellect, and the parasitic nature of capital which increasingly becomes a barrier to these capacities (cf. Marx 1993, 706). And secondly, it suggests that this tendency exposes the increasing bankruptcy of the labor theory of value, which Marx suggests in the Fragment, must cease to be valid when labor time is replaced by general social knowledge as the “great foundation-stone of production and of wealth”(ibid, 705).

5.4 *Critique of the Fragment as Crisis theory and the Notion of Relative Surplus Value*

As we have just seen then, the post-Workerist tradition relies importantly on the Fragment on Machines to provide a form of breakdown theory of capitalism based on the contradiction that Marx identified between “the tendency to reduce labor time to a minimum while, on the other hand, positing labour time as the sole measure and source of wealth.” (Marx quoted in Heinrich, 212)” It is drawing on this contradiction outlined in the Fragment that Negri and others suggest a “crisis in the law of value”, and assert with confidence that the emergence of ‘general social knowledge’ as a direct force of production signals the beginning of the end for the capitalist mode of production (see Vercellone 2010).

However, as Michael Heinrich has argued, we should be careful with reading the Fragment’s crisis theory out of its context in the development in Marx’s thought. At the time of writing the *Grundrisse*, Marx had still not fully developed the basic categories of his critique of political economy and was still partially operating within the categories given by bourgeois economics. This meant, Heinrich suggests, that Marx could not yet solve the riddle of why capitalists would strive to diminish labor time spent in the production process while at the same time positing labor time as the primary measure of value. Based on empirical observations of the increased application of science and machinery in the production process, and the diminishing role of ‘immediate labor’ in this same process, Marx was led in the Fragment to draw the

(according to Heinrich) premature conclusion that this indicated nothing less than that capitalism was working towards its own imminent self-destruction.⁴⁸

When Marx later returned to the issue in *Capital* he would, however, no longer argue that the increased use of automation and techno-science in the production process implied the necessary disappearance of abstract human labor as source or adequate measure of value. So what had changed? Heinrich's explanation is that when writing the *Grundrisse*, Marx was still lacking "an adequate concept of the production of relative surplus-value." (Heinrich 2013, 206). Once in place in Marx's theoretical apparatus, the distinction between absolute and relative surplus value provided a justification both for the increased use of machinery in the production process, as well as for why this tendency was not inevitably going to do away with the centrality of human labor for capitalist valorization.

In order to understand this argument, we must begin with a basic definition of the two terms. Absolute surplus value in Marx is constituted by that which is produced for capital by workers beyond the value of their labor-power. The production of absolute surplus value, Marx says, "turns exclusively upon the length of the working-day" (Marx 1992, Ch. 16), and an increase in the amount of absolute surplus value can thus only be achieved by increasing the number of hours worked. Relative surplus value, by contrast, is derived from an intensification and increased productivity of the labor process through the introduction of machinery and scientifically coordinated divisions of labor and/or the reduction of the cost of labor power. Instead of prolonging the absolute number of hours worked, the production of relative surplus

⁴⁸ Heinrich gives an additional explanation as to why Marx at the time was led to draw this conclusion. During the 1850's Marx was still operating with a "one-sided" and fairly limited understanding of crisis, conceiving of capitalist crisis as the final moment that would bring about its collapse and lead to socialist revolution. In 1857, during the very time that Marx was writing the *Grundrisse*, what has been called the first world economic crisis unraveled across an increasingly interconnected world market. This led Marx to rush his work to produce a theoretical justification for the crisis and how it indicated exhaustion of the capitalist system and the coming socialist revolution(s). But unlike Marx had predicted, the crisis passed and no revolutions happened. This disappointing outcome, Heinrich suggests, taught Marx an important lesson, explaining his more cautious approach in *Capital* to the contradiction which he in the *Fragment* had suggest held the potential "to blow this [capitalist] foundation sky-high".

value involves a relative extension of the hours of productive labor appropriated by capital through an increased rate of exploitation.

Based on the distinction between absolute and relative surplus value, Marx was able to see that the same process that reduces the necessary human labor time used in the immediate process of production by means of technical innovation (the tendency that he had in the Fragment identified as suggesting the vanishing role of human labor in general), at the same time augments “the social value of the article produced above its individual value.” (Marx Capital Vol. 1, Ch. 15 3b) Remember here Marx’s social conceptualization of value - “not as the objectification of labour immediately spent in the production of a determinate commodity, but as an expression of the quantity of social labour objectified in the commodity.” (Tomba 2007, 29). The value objectified in a commodity is thus determined not by the quantity of concrete amount of labor used to produce it, but rather by the social average quantity of labor time needed to produce such a commodity at any specific time. The capitalist who introduces machinery in the production process can potentially reduce the amount of labor spent in the production of a specific commodity below the socially necessary average, thereby generating a relative increase in the surplus value that can be realized through sale of this commodity. The key point here is that this relative surplus value generated through increased automation of production, as Massimiliano Tomba argues:

“is relative ... because it, to be real, must be placed in relation to absolute surplus value. To the extent to which the capitalist that takes advantage of a technological innovation realizes at least a part of the relative surplus value that is potentially his [sic], this surplus value takes form through a social transfer of value from productive areas of high absolute surplus value towards those of high relative surplus value. The relative increase in the labour productivity and of the surplus value in some sectors of production leads to a de-valorization of labour-power that could also manifest itself as growth of the exploitation of reproduction work – whether waged or unwaged. (Tomba 2007, 32) “

The concept of relative surplus value thereby posits the necessary reciprocity between on the one hand the extension of technologically enhanced production, which produces relative surplus value, and on the other an increase in the production and appropriation of absolute surplus value based on the extension of labor time. While the introduction of machinery can increase the rate of surplus value extraction within a given amount of labor time by amplifying the productiveness of labor, “it is clear that it attains this result, only by diminishing the number of workmen employed by a given amount of capital. It converts what was formerly variable capital, invested in labour-power, into machinery which, being constant capital, does not produce surplus-value.” (Capital Vol. 1, Ch. 15 3b). As for Marx, the only source of surplus-value is variable capital (human labor), the introduction of more machinery at one point thus has to be compensated for by an increase in the extraction of absolute surplus value *somewhere else*.⁴⁹ Additionally, it is important to note here how the development of machinery in production also leads to a cheapening of labor power (both by working as a form of coercion, but also by reducing the cost of reproduction), which creates a counter-tendency to further automation. Machines will, in other words, not be introduced indiscriminately into the production process, but only when they actually reduce production costs relative the socially necessary average (machines are expensive!). This primacy of the profit-motive thus constitutes an additional check on the tendency identified in the Fragment towards the substitution of machines for human labor.

⁴⁹ One should keep in mind here the key distinction between wealth and value in Marx. In the case of wealth, Tony Smith argues, capitalism has “always crucially depended upon ‘free gifts’ that capital claimed as its own” (natural, but also the unrecognized social ones) and as he adds “[t]he causal role of these sorts of factors in the production of wealth has always been incalculably large, and so there has never been a period of capitalism in which embodied labour served as the proper measure of wealth.” (Smith in Bellofiore et al. 2013) The labor theory of value developed by Marx was, however, never about measuring wealth, but rather value, the social form of wealth under capitalism. In other words, it is value, and not wealth that takes abstract human labor as its measure. This distinction, in somewhat simplified terms, is what allows for the simultaneous growth in the production of material wealth through the scientific augmentation of the production process, and the continued use of socially necessary labor time as measure value within capitalism.

Why then take up the category of relative surplus value in relation to a set of theories that proclaim the contemporary bankruptcy of the labor theory of value? Surely, those that argue the contemporary obsolescence Marx's value theory have both time and plenty of examples on their side. However, I want to emphasize here that the present critical interrogation of the crisis theory outlined in the Fragment (and encapsulated in post-Workerist method of the tendency), is neither an attempt to reinstate Marx's value theory tout court, nor to suggest a linear development of Marx's thought where latter writings simply disqualify or trump the content of his earlier works. Rather, the point is to show that Marx continued to work through the issues that he encountered in the Fragment, eventually coming up with a number of insights that complicated his earlier conclusions. This again does not mean to say that Marx in these later works was automatically more correct in his analysis, or produced a solution more adequate for us today. Rather, it points to the importance of "retrac[ing] Marx's gesture, that is, to pose once again the problem that is inside the question of value" (Tomba 2007, 26). The value of Marx's value theory today is to be found not in the provision of an objective definition of value, but rather in how it helps us to pose the question of value and interrogate it as a historically and spatially contingent social/political problem.

By insisting, as we have seen, on the necessary reciprocity between high and low organic composition of labor, between technologically advanced and raw forms of labor exploitation, the category of relative surplus value retains significance in contemporary formulations of the problem of value, not as an absolute category, but rather through its emphasis on the relational and synchronous (rather than diachronic) nature of different forms of subsumption of labor to capital. It thus helps us to see how "capitalist accumulation has thrived precisely through its capacity to simultaneously organize development and underdevelopment, waged and un-waged labor, production at the highest levels of technological know-how and production at the lowest levels." (G. Caffentzis and Federici 2007). While post-Workerist theories of cognitive capitalism and immaterial labor raise important questions about (some of) the limitations of Marx's value

theory for understanding new and emergent forms of production and exploitation, the theory of relative surplus value directs attention to the problem of the contemporaneous co-existence of such emergent or tendential forms with the continuation (and intensification) of other raw and violent forms of exploitation and dispossession (including neo-slavery, land grabbing etc.). As such, it poses a both important and necessary counterpoint to those that in their historicist proclamation of the tendential hegemony of immaterial and cognitive forms of labour, are prone to treat other exploitative and dispossessive forms as residual remains of a bygone age, rather than as fully complementary aspects of contemporary global capitalism.

The example of Uber, taken from the epigraph, can serve to highlight this point. For on the one hand, Uber appears as a success story of entrepreneurs who through their intellectual and innovative labor, combined with the new possibilities of ubiquitous digital technologies, have created a smartphone application that has become a global phenomenon (the latest rounds of investments in 2015 valued Uber at \$51 billion). On the other hand, however, we can see that this ‘success’ is directly connected to the intensified exploitation of tens of thousands of low-income service workers who become defined as self-employed “micro-entrepreneurs” (meaning that they bear even more risk, having less security than in the already notoriously exploitative taxi sector). On the one hand, Uber seems to exemplify the remarkable productivity of immaterial production. On the other hand, we see how this productivity derives from the depreciation of an entire service sector as prices (but not profits) are being cut, leading to increased precarity among workers who often have few other options for selling their labor on the labor market.

The value of Marx’s relational value theory here is that it pushes us to look beyond the appearance of machinic and intellectual productivity, only to discover an often intensified exploitation of human labor. For as among others Massimo De Angelis has argued, one of the problems with tendential categories such as cognitive capitalism and immaterial labor is that they do not help us to decipher the new global hierarchies instilled through these communicative

forms of global capitalism.⁵⁰ That is, they conceal the fact that tendency towards immaterial labor, as we can see clearly through the example of Uber, involves the emergence of new social (and spatial) stratifications (Angelis 2006, 169).

To make this point, however, we do not have to limit ourselves to the perspectives of strong defenders of Marx's value theory. In the great chapter on the "Civilized Capitalist Machine" in *Anti-Oedipus* (1983), Deleuze & Guattari draw on Marx's Fragment to introduce the category of "machinic surplus value", which they suggest cannot be reduced to the value transfers implied by the theory of relative surplus value.⁵¹ Machinic surplus value, which stems from the creative and innovative capacities of the 'general intellect', thus represents a clear break with Marx's labor theory of value. However, unlike in the post-Workerist theories of cognitive capitalism and immaterial labor, the 'revisionism' of Deleuze & Guattari does not lead them to abandon or dismiss the impetus of Marx's value theory in its entirety. Rather they argue for the continued importance:

"of human surplus value ... even at the center and in highly industrialized sectors. What determines the lowering of costs and the elevation of the rate of profit through machinic surplus value is not innovation itself, whose value is no more measurable than that of human surplus value. It is not even the profitability of the new technique considered in isolation, but its effect on the over-all profitability of the firm in its relationships with the market and with commercial and financial capital. "(233)

While departing from the strictures of the labor theory of value (and its humanistic implications), Deleuze and Guattari importantly retain an emphasis on the differential and relational character of value as determined by a social totality not reducible to any singular point

⁵⁰ I want to clarify here that I do not make that claim that, for example, De Angelis represents an orthodox supporter of Marx's value theory.

⁵¹ For recent discussion of this concept in Deleuze & Guattari, see Pasquinelli (2015).

or tendency.⁵² They carefully avoid the reification of innovation and technological progress, suggesting a co-constitutive relationship between the emergence “the most progressive and the most automated sectors” at the core, and “a veritable “development of underdevelopment” in the periphery.⁵³ For the latter, they argue “ensures a rise in the rate of surplus value, in the form of an increasing exploitation of the peripheral proletariat in relation to that of the center” (231).⁵⁴ So while machines are recognized as productive of value, it is nevertheless precisely through the reproduction of the “differential relation[s]” between technically advanced centers and highly exploitative peripheries that Deleuze & Guattari’s capitalist machine is able to continue its expansion. And as they warn, in what appears as a critical anticipation of the thesis on the increasing autonomy of immaterial labor; “by no means does [this capitalist machine] confer on its scientists and its technicians an independence that was unknown in the previous regimes” (233). The development of technical machines, they argue, is primarily organized for the benefit of the social capitalist machine, and not the other way around.

In this section, I have outlined some different ways in which the post-Workerist tradition

⁵² In contrast to those theorists who argue for the specific immeasurability of value under cognitive capitalism [source], Deleuze & Guattari imply that this measurement problem is not new (‘human surplus value is no more measurable than innovation’), but has rather always been at the heart of capitalism as a deterritorializing and decoding machine. Capitalism for Deleuze & Guattari functions as an axiomatic that allows for the calculation and extraction of surplus value from the manifold differential conjunctions of decoded and deterritorialized flows of capital and labor. Using a common unit of measure for these two flows, they argue equates to “pure fiction, a cosmic swindle”, because “there is no common measure between the value of the enterprises and that of the labor capacity of wage earners.” It is precisely capitalism’s capacity to extract surplus from connecting such incommensurable flows that bestows it with such flexibility and resilience, suggesting that a problem of measuring value of collective social knowledge does not for Deleuze and Guattari, as for some others, correspond to an inevitable termination point or “exterior limit” for the capitalist mode of production.

⁵³ It is worth noting here that they emphasize the existence of such processes at different scales, where peripheries develop also within the centers themselves.

⁵⁴ And as they importantly add: “it would be a great error to think that exports from the periphery originate primarily in traditional sectors or archaic territorialities : on the contrary, they come from modern industries and plantations that generate an immense surplus value, to a point where it is no longer the developed countries that supply the underdeveloped countries with capital, but quite the opposite. So true is it that primitive accumulation is not produced just once at the dawn of capitalism, but is continually reproducing itself.” (231)

has mobilized a tendential reading of Marx's Fragment as the basis for a theorization of contemporary capitalism. I have also introduced a number of critiques that delineate some of the limitations of such tendential theorizations, and have argued for the importance of concepts and frameworks sensitive to relationality more broadly. Next, I want to suggest that we can find promising grounds for developing such frameworks within the early history of workerism itself. First, however, I turn to a recent theoretical fad known as accelerationism, which through its more programmatic character allows us to more clearly interrogate some of the political implications of a tendential reading of the Fragment.

6. ACCELERATIONISM AND THE PROBLEM OF TECHNOLOGY

We believe the most important division in today's left is between those that hold to a folk politics of localism, direct action, and relentless horizontalism, and those that outline what must become called an accelerationist politics at ease with a modernity of abstraction, complexity, globality, and technology." (Srnicek and Williams 2013).

The material platform of neoliberalism does not need to be destroyed. It needs to be repurposed towards common ends. The existing infrastructure is not a capitalist stage to be smashed, but a springboard to launch towards post-capitalism." (ibid).

Accelerationism is a concept and strand of political theorization that has generated significant debate in recent years following the publication of Nick Srnicek's and Alex William's *Manifesto for an Accelerationist Politics* in 2013 (see Srnicek & Williams 2013; Noys 2010, 2014; Mackay & Avanesian 2014; Negri 2014; Pasquinelli 2014).⁵⁵ Accelerationism presents itself as a theoretical

⁵⁵ The term accelerationism was originally devised by Benjamin Noys in his book *The Persistence of the Negative* (2010), to connote a particular affirmationist tendency within French and to a certain extent Italian counter cultural theory emerging in the wake of 1968. What the accelerationists affirm, Noys argues, "is the capitalist power of dissolution and fragmentation, which must always be taken one step further to break the fetters of capital itself." While Noys conceived of accelerationism in primarily negative terms to suggest that accelerationists had mistaken the 1970's post-Fordist reorganization of capitalist accumulation for signs of its immanent self-implosion, the concept has since been picked up by a number of other scholars who have redeployed it in more positive and politically programmatic forms (cf. Srnicek & Williams 2013, Mackay & Avanesian 2014). One of the key reference points for this position is a section from Deleuze & Guattari's *Anti-Oedipus*, in which they build on their idea of capitalism as a deterritorializing and reterritorializing machine to suggest that perhaps "the flows are not yet deterritorialized enough?" and so the truly revolutionary path would be "[n]ot to withdraw from the process, but to go further, to 'accelerate the process.'" (239-240). Deleuze & Guattari's call for acceleration, implies then, according to its recent interpreters, that there is no longer any tenable possibility of breaking free or retreating from capitalism (Deleuze & Guattari's idea of acceleration was posed specifically against Samir Amin's call for decolonizing countries to withdraw from the capitalist

and political intervention at a moment of generalized crisis and “coming apocalypses” These crises, accelerationists argue, are the result not only of the intensifying onslaught of neoliberalized creative destruction and the haunting return of the externalized costs of fossil-fueled capitalist globalization, but also of the “inability” of the political and academic left “to generate the new ideas and modes of organization necessary to transform our societies to confront and resolve the coming annihilations” (Srnicek and Williams 2013, 2) This malaise of the contemporary left, is blamed largely on a fetishization of horizontalism and localism, combined with an exaggerated suspicion of technology, abstraction and reason.

What if, accelerationists ask, the path towards overcoming the capitalist world system is to be found not in the rejection of modernity, development and technocratic planning, but rather in the reappropriation of these projects for different ends? What if, as Srnicek & Williams imply in the epigraph to this section, the realization of post-capitalism involves not separating from, or simply smashing the infrastructural landscape of neoliberal capitalism, but rather thoughtfully strategizing to take it over from within? What if we could “preserve the gains of late capitalism while going further than its value system, governance structures, and mass pathologies will allow [?]”(Srnicek and Williams 2013). And what if, instead of trenchantly fighting against them, we would push existing political, social and technological tendencies of ‘creative destruction’ to the point where they would break the fetters imposed by a capitalist system always in need of imposing new borders and boundaries?

For Accelerationists, Marx— with his optimistic attitude towards capitalism’s unprecedented capacity for dissolution and abstraction, and his fascination for the enormous productive forces unleashed by the unholy alliance between techno-scientific innovation and capitalist accumulation – represents a form of Ur-accelerationist. And within his larger body of

world system). This option, Accelerationists argue, has been foreclosed upon, and as they are quick to add, it would not be desirable to go back anyway. Rather, “the only way ‘out’ is to plunge further in” while seeking the “immanent radicalization” of capitalism’s own dynamic of abstraction, decoding and deterritorialization, to co-opt it from within and push further (See Mackay and Avanesian 2014, 13) .

work, the *Fragment on Machines* is identified as his “perhaps most openly accelerationist writing” (Mackay and Avanessian 2014, 9). The Fragment, with its narrative of machinic subsumption as the harbinger of capitalism’s coming collapse, is, in other words, read by accelerationists as a text that first institutes technological acceleration as a political imaginary.⁵⁶

However, accelerationism is interesting here not only for its engagement with Marx’s Fragment, but also for two other reasons. For what accelerationism offers is, in many ways, an intensification and extension of certain aspects of the post-Workerist theories discussed above. Accelerationism takes its starting point in the identification of a growing antagonism between the enormous productive potentialities of the contemporary socio-technical landscape and the value-form of capital (see Mackay & Avanessian 2014; Negri 2014). However, at a moment of mounting crises, Accelerationists argue that we can’t afford to wait for capitalism to undermine itself, but that we must actively and strategically accelerate certain tendencies that can aggravate already existing tensions. In this sense, accelerationism can be said to be more politically programmatic, pushing the tendential implications of post-Workerism to their limits.⁵⁷ As Toni Negri has approvingly suggested in a recent comment on the Accelerationist manifesto, - “Some of us perceive [accelerationism] as an Anglo-Saxon complement to the perspective of post-Operaism—less inclined to revive socialist humanism, and better able to develop a new positive humanism“ (Negri, 2014).

What accelerationists want to accelerate then, is precisely the tendency toward machinic

⁵⁶ Apart from the ‘Fragment’, accelerationists also draw on the *Communist Manifesto*, with its recognition of capitalism’s capacity to ‘melt all that is solid into air’, as well as the 1859 preface, where Marx suggests that “the material productive forces of society come into conflict with the existing relations of production [and] from forms of development of the productive forces these relations turn into their fetters. Then begins an era of social revolution.” In all three cases, what the accelerationists take from Marx is the admiration of capitalism’s capacity to continuously break down barriers and dissolve social structures.

⁵⁷ Already in *Empire*, Hardt & Negri also suggested that the crucial task was to not simply resist Empire, but rather to reorganised and redirected its liberatory potentials towards new ends.

subsumption of society described by Marx in the Fragment.⁵⁸ Accelerationism in other words, actively embrace processes of creative destruction, abstraction and maximal modernization taking place in the contemporary technological city. For since they see no possibility of going back, and the only way ‘is through and beyond,’ they propose that the task for the contemporary left is to beat capitalism at its own game of technological upgrading and thereby develop a leftist “sociotechnical hegemony.” In other words, the problem for accelerationists is not development, but rather that development under contemporary capitalism is not taking place fast enough.⁵⁹

Accelerationism also makes more explicit the problem of technology that permeates the Fragment. For one of the central tenants of an accelerationist politics, as suggested in the epigraph, is the reappropriation of contemporary capitalism’s infrastructures for different ends. In this sense, the accelerationist project differs from post-Workerism in that it foregrounds technology itself as central to the post-capitalist project.⁶⁰ In the Accelerationist manifesto, Srnicek and Williams argue that capitalism is in fact standing in the way of technological progress, and therefore “the true transformative potentials of much of our technological and scientific research remain unexploited” (2013).

However, by centering on the perceived contradiction between the technological forces of production and the social relations of capital, accelerationism comes awfully close to appropriating the objectivist view on technology dominant in the crude Marxism of the Comintern. For as Stalin wrote almost a century earlier, the “capitalist relations of production have ceased to correspond to the state of productive forces of society and have come into irreconcilable contradiction with them”; revolutionaries thus learn that their ‘mission’ is “to replace the existing capitalist ownership of the means of production by socialist ownership”

⁵⁸ “We want to accelerate the process of technological evolution” write Srnicek and Williams.

⁵⁹ For useful critiques of this position, see Noys 2014

⁶⁰ In post-Workerism, technology, as we have seen, largely recedes into the background, as it is general social knowledge that is identified as the true dynamic force in contemporary society.

(quoted in Slater 1980, 17–18).

As I will argue next, this crude position on technology appropriated by accelerationists was debased already 50 years ago by one of the founding figures of Workerism. By returning to this Workerist critique of technology, we can shed some additional light on the question of whether the contemporary digital city is ... “a capitalist stage to be smashed ... [or] a springboard to launch towards post-capitalism” (cf. Srnicek and Williams 2013).

6.1 *Critiques of technology – Workerism before the Fragment*

In order to complicate the explicit techno-optimistic of accelerationism (and the implicit one of post-Workerism), I want to return to the early days of Workerism, and to what we might refer to as the tradition’s pre-Fragment moment.⁶¹ The first important theoretical contribution coming out of this emerging tradition was namely a critique of technological objectivism developed by Raniero Panzieri, one of the founding figures of Workerism, and the editor of *Quaderni Rossi* (the first Workerist journal).

In an essay titled the “Capitalist use of Machinery”, published in the first issue of *Quaderni Rossi* (1961), Panzieri challenged the instrumental conception of technology dominant within the Marxist-Leninist left at the time. From this dominant stand-point, technology was understood simply as forming part of the objective forces of production; forces that could be appropriated by, and in fact be put to better use under communism.⁶² Against this objectivist tendency, Panzieri argued that the social relations of production did not exist as some neatly separable layer that could simply be peeled of and replaced by a different model of organizing

⁶¹ A translation of the Fragment on Machines was published in the fourth issue of *Quaderni Rossi* (~1964), and quickly became a central and continuous reference point for Workerist and later post-Workerist theorizations of capitalist transformation.

⁶² Lenin famously argued that “Communism is government by the Soviets plus the electrification of the whole land”. And Stalin, as we already touched upon above, suggested an irreconcilable contradiction between the forces and social relations of production under capitalism, which necessitated a shift from capitalist to socialist ownership of the means of production.

society (such as communism). Instead, he famously suggested that the social relations of production (the antagonist relation between capital and labor) were found within the forces of production (Panzieri 1961 in Slater 1980). Technology was, in other words, not merely used in the capitalist production process, but was actively molded to improve and strengthen this very process. Technological progress could similarly not be separated out as an objective force, but was in many ways determined and shaped by the antagonistic relation of capital. What Panzieri articulated in his important article was a) that the materiality of technology matters since the relations of production are found within such technologies; and b), that the objectivist perspective on technology served as an effective ideology that concealed this fact.⁶³ While the influence of Panzieri and his critique eventually diminished within Workerism, one study in particular, the study of *Organic Composition of Capital and Labor-Power at Olivetti* by Romano Alquati, was heavily influenced by Panzieri's work, and extended his critique of technology in important ways.⁶⁴

6.2 *Alquati and the Study of the Olivetti factory*

In 1961, Romano Alquati (another key figure in early Workerism), wrote an article for the journal *Quaderni Rossi* based on extensive research he had conducted together with workers at the Olivetti factory in Ivrea outside Turin.⁶⁵ The Ivrea factory was one of the most advanced in

⁶³ Panzieri was later accused of extending the idea of capitalist domination exerted through technology too far, by mistaking visions of rationalized landscapes for a reality which was in fact much messier and contradictory.

⁶⁴ His diminishing influence can in part be explained by the fact that Panzieri died prematurely in 1964 at the age of 43.

⁶⁵ The article was published in two parts partially in two subsequent issues of *Quaderni Rossi* in 1962-63

Italy at the time.⁶⁶ Alquati –one of the pioneers of a radical form of industrial sociology known as co-research – was particularly interested in delineating the changing political subjectivity of factory workers in the face of this advanced technical reconfiguration of industrial labor (Wright[□], 2013). The goal of the Olivetti study was to identify and possibly substantiate political currents and forms of resistance among workers emerging out of the hypermodern factory environment Ivrea represented. While the Olivetti text is primarily remembered as a text that explicitly articulated the workerist discourse on class composition (Wright, 2013), I’m here interested in how it also extends and substantiates the critique of technology and planning initiated by Panzieri.⁶⁷ Alquati’s investigations, which heralds from the pre-Fragment moment in Italian Workerism, offers important insights on the relational, differential and spatial aspects of technological development that further help to problematize the techno-optimistic position expressed in accelerationist and tendential readings of Marx’s Fragment.

In his analysis of the changing conditions of work at Olivetti, Alquati focused on the factory’s assembly line, in particular the conveyer belt. Alquati argued the assembly line signaled the advancement of automation and the closely related emergence of “new management techniques” for control and coordination of labor. Of particular importance was the increased

⁶⁶ Olivetti, for example, in 1964 launched the Programma 101, which is considered to be the first commercial desktop computer.

⁶⁷ The concept of class composition – which can perhaps best be understood as a form of political analytic focused on the relation between the ‘objective’ or technical conditions of production and the emergent political subjectivities of the working class – emerged as part of the attempt by the early workerist scholars of the Quaderni Rossi group (among others Raniero Panzieri, Mario Tronti, Romano Alquati and Antonio Negri) to grapple with the changing conditions of the Italian working class during an intense phase of Italian post-war industrialization known as the “Italian miracle”. During this period, millions of young unskilled workers migrated from the South to the industrializing cities of the North, constituting an emergent ‘new working class’ coming into formation in the rapidly expanding factory environments around cities like Turin and Milano. In this context, the idea of class composition importantly functioned to destabilize ossified and mythical notions of the working class dominant within party and union circles at the time by approaching class as a historically situated process rather than an a priori category; as a class always in the making. Class composition here came to also imply a practice and research method (co-research) that committed the political renegades of the Italian far left to return to the factories and study the actual conditions of workers and their social struggles under changing technical (automation, deskilling) conditions of production in order to identify the revolutionary potential of this new emerging subject of the “mass worker” and how it related to the transformations of capitalism.

centrality of ‘control information’ for monitoring, planning and optimization of the production process (Wright, 2013).⁶⁸ The cybernetic logic of informationalization and optimization developed at Olivetti was, however, not to be understood simply as a model and technology for the spatio-temporal reconfiguration of the ‘most advanced’ forms of assembly labor within the factory itself. Rather, Alquati argued, the real significance of the assembly system at Olivetti was “as an explicative template of a whole series of vaster (internal and external) phenomena” (Alquati 1961). In a remarkable passage, his analysis of the assembly line leads Alquati to anticipate what we today refer to as global production/value chains and computer-coordinated just-in-time production:

The equipment is a fact of even greater importance than it materially appears to those who view it. It is this that links the workstations, connecting them also as phases on the assembly process, and linking them in a global cycle within which each job is inserted. They integrate operations in a mechanical way, and coordinate them spatially and temporally with the totality of the other moments of production (for example, the conveyor brings the components from the various workshops where they have been manufactured) and has a constant rhythm that needs to express, with its regularity, a whole series of predetermined steps [scadenze], etc., etc., various quantities, various types, in various pre-established moments. The equipment expresses all this already. It already encapsulates the global logic of neo-capitalism connected to the phase of automation, of decentralization, of delegated planning, of enterprise- wide integrated planning, etc., and of the system with its market and its “qualitative” consumer goods. The equipment of the assembly line, rather than the supervisor, has the function of organizing labor according to this logic. The supervisor’s function instead involves integrating or compensating for the secondary dysfunctions that the system in its imperfection produces. (Alquati 1961)

More than simply a technology for subjugating factory workers, Alquati in the Olivetti assembly line finds the material manifestation of a centralized logic of control for a distributed production system. This system allows for the increasing integration and coordination of a wide variety of

⁶⁸ See also Pasquinelli (2015) on how Alquati in the Olivetti study provide an early theorization of the valorization of information

processes and flows also in the surrounding region, including “auxiliary” and “artisanal” forms of labor such as transportation, small-scale workshop labor, and agricultural production. All of these different moments increasingly became functions within a “single unity” of the production cycle coordinated by the rhythms of the conveyor belt.⁶⁹ Echoing his comrade Mario Tronti’s conceptualization of the “social factory” as the extension of the factory logic to the whole of society, Alquati draws the conclusion that “the factory [therefore] does not exist as a moment that can be separated” (ibid). The implications of this for the organization of struggle, Alquati’s argued, was that the insights gathered at Olivetti had to be carried beyond the immediate context of the factory process and understood as a “part within the whole that we ‘are keeping an eye on’” (ibid). It was, in other words, crucial to link the technological decomposition of labor in the industrial factories of the North to other parts of the ongoing cycle of struggles in Italy and beyond, thereby countering the increased atomization of struggles caused by the deepened divisions of labor to “attain that generality of discourse that renders struggle global” (ibid).

Out of this analysis emerges two important insights that can help to further substantiate the problems of objectivist accounts of technological modernization outlined above. The first relates to Alquati’s emphasis on the need to understand the relations between the ‘pole of development’ represented by the Olivetti factory, and the larger totality within which this development is taking place. What Alquati shows is that while it is absolutely central to trace the latest and most advanced tendencies within capitalist production, it is equally important to avoid the objectivist trap that reifies such tendencies as something that can be understood and analysed by and of itself. The role of the militant researcher, for Alquati was exactly to surpass such “blind empiricism” and link the hypermodern factory order to other, and at first seemingly disparate and anachronistic, forms of struggle. Here Alquati connects Olivetti not only to the outsourcing of production to the small firms in the surrounding region, but also to violence of

⁶⁹ A process which Alquati suggested was “driving the “full intensification of labor exploitation, at all levels” (ibid).

the colonial relations that were at the time of Alquati's writing made particularly clear by the decolonial struggle in Algeria. For, as he suggests, it is "the colonial profits [that] make possible at Ivrea the introduction of plant that carries the intensification in the exploitation of the workers of the "pole of development" to an even more advanced level, and vice versa" (ibid). These different forms of exploitation are, Alquati argues, inextricably related, and has to be understood as internal to, and productive of, the globalized 'neocapitalist' system which functions "precisely thanks to its internal imbalances, that reproduce relative "depressions" internally, and deepens them in order to advance as a system of profit (ibid).

Olivetti's Ivrea factory, as an anticipation of a cybernetic model of capitalist organization, is not so much a pinnacle of technological rationalization to be celebrated or cursed as a site of unique productivity or exploitation, as it is to be understood as a relational and strategic space accumulating power over a distributed network through its capacity to regulate flows. "The interdependence tightens", Alquati writes, "but the propulsive moment belongs to the large firm, of the most advanced technological level, as power, as the concentration here of the profit motive" (ibid). Alquati's analysis is valuable exactly because it poses a challenge to any crude accelerationist and developmentalist narrative that privileges the supposedly highest stage of development as heralding the inevitable techno-scientific overcoming of the increasingly moribund relations of production. Rather, what his analysis shows is how neocapitalism is precisely a system that thrives on the simultaneous existence of 'poles of development', and areas of underdevelopment to be played off against each other.

Building on the critique of technology and technocratic rationalization initiated by Panzieri, Alquati's study further complicates the problem of technological reappropriation as it has been posed by Accelerationists above. For Alquati, the conveyor belt is not simply a tool incorporated into and deployed according to a neo-capitalist logic of globalized exploitation and domination. Rather, it constitutes and encapsulates this very logic "in its pure state" (ibid). There is, following Panzieri, no clear line of separation between the social relations and the technical

configuration of production – and for both Alquati and Panzieri, the advancement of communication technologies and technocratic rationalization in the production process, as exemplified by Olivetti, is understood precisely as the objective appearance of the extension and deepening of capitalism’s despotic subsumption of labor on a global scale.⁷⁰

One obvious problem with this position is that it appears to reduce planning and technoscience to the logic of exploitation and profit-seeking capitalism – as being capitalist through and through (precisely the problem that Marx was attempting to avoid in the second part of the *Fragment*). However, while this is obviously then a problematic position, this problem of over-extending in a dystopic direction does not necessarily take the thrust out of the critique developed by Panzieri, which was aimed at the objectivist or reified understanding of technology, planning and development common among Italian (and other) Marxists at the time. Furthermore, I want to suggest that already in Alquati, we find a more nuanced picture. Alquati’s study suggests the importance of connecting the analysis of specific technologies and technological affordances to the larger socio-technical totality, where the specific technology is understood as always situated within a complex set of relations which it is both shaped by and simultaneously transforms.

Deleuze and Guattari would come to argue that “the technical machine is ... not a cause but merely an index of a general form of social production...” (Deleuze and Guattari 1983). Over a decade earlier, Alquati showed how the conveyor belt in its specificity offered a window onto the larger social totality that had produced it. While this conveyor belt should not be reduced to a pure materialization of capitalist despotism, neither should it be treated simply as an objective force of production that can be appropriated for different ends. Rather, what Alquati’s work on the Olivetti factory implies is that any serious political project aimed at the

⁷⁰ We can here see how Alquati’s analysis resonates with the first part of the ‘*Fragment*’, where Marx describes how the machine is the ideal form of capital, because it objectifies or crystalizes the division of labor (relations of production).

emancipation of society from the capital relation will necessarily have to be a socio-technical project.

Having outlined this critical perspective on technology from a pre-Fragment moment in Italian Workerism, I would like to return to the Fragment itself in relation to contemporary theorizations of the metropolis. Drawing on eminent urban and spatial theorist Henri Lefebvre's reading of the Fragment, the final section of this thesis introduces the vector of space as an important complication to tendential theorizations of urban transformation common in the contemporary moment.

7. THE FRAGMENT AND URBAN TRANSFORMATIONS

In a section of the often overlooked book *La Pensée Marxiste et la Ville* (Marxist Thought and the City, 1972), French Marxist and urban theorist Henri Lefebvre engages the ideas of technology and automation as posed in Marx's famous 'Fragment on Machines' in relation to his own emerging work on urban society.⁷¹ In his reading, Lefebvre suggests that the emergence of the 'general intellect' – the now familiar distributed production system of automated machines and social cooperation – is directly connected to the dissolution of both the spatial unit of the industrial city and the social order of wage labor. "To the list of ends" he writes, "we can now add the end of work and the end of the city" (Lefebvre 1974, 64). In a dialectical but also somewhat mysterious formulation, Lefebvre suggest that work is not replaced by free time, however, but rather with non-work.⁷² And the city "does not end with the country, but in the simultaneous overcoming of city and country." In its place emerges urbanism, dissolving both the city and country and replacing them with a new scale of (planetary) urban centralization and peripheralization (see Brenner 2014; Merrifield 2013).

In contrast to many of the post-Workerist, who read the Fragment as a hymn to the revolutionary potentials emerging out of a society permeated by techno-science and automated

⁷¹ This book was translated into a number of different languages in the 1970's, but never to English. This has meant that it has been largely neglected in Anglo-American readings of Lefebvre, with a few exceptions (see Merrifield, 2013). *La Pensée* is interesting, in part because it came out in the middle of period during which Lefebvre penned some of his most important work, including *The Right to the City* (1968), *The Urban Revolution* (1970), *The Survival of Capitalism* (1973), and *The Production of Space* (1974).

⁷² More specifically, Lefebvre suggests that "[t]he activities that they are dealing with, and especially the intellectual (scientific) activities through which they create the social brain that directs the bodily organs (the automated machines/mechanisms) can not be compared to work." (Lefebvre 1972, *my translation*) But this dissolution of work can also be said to resonate with Fredric Jameson's more recent thesis on how capitalism is a system that ultimately produces unemployment (Jameson 2011).

machinery, Lefebvre takes a somewhat more pessimistic stance towards the development anticipated by Marx. For here, the prospect originally outlined in the Fragment is read in relation to his own recently formulated hypothesis of a great urban revolution (Lefebvre 1970/2003). In this context, Lefebvre sees how the Fragment anticipates a further expulsion of urban populations from concrete productive practices, leaving many of them increasingly confined under urban regimes of automation, calculation and control. “What would happen”, he writes in *La Pensée*,

...if the automatic devices invaded the streets, the monuments, the homes? If the combination of mechanic and intellectual elements occupied the intellect and subordinated humans in the process? ... how is one to overcome this new monster, Leviathan, Golem? Is it absolutely necessary to cooperate with him, try to reach a compromise instead of taking the lead oneself? (Lefebvre 1974, 64–65, my translation)

Drawing on the Fragment, Lefebvre poses the question of how to relate to the increased pervasiveness of automated and informational technologies in urban space he detected already in the 1970's. Should we engage with it for imagining and working towards a different form of life? Are we to wait for the potential self-collapse of capitalism that Marx had anticipated? Or are we being led into the further subordination to a system of cybernetic ordering and control?

Only a year later, in *The Survival of Capitalism* (1973), Lefebvre would return to this problem of modern technology that he had encountered in the Fragment in relation to his attempt to understand the “reproduction of the relations of production”. Here he would come to suggest that machinic automation and the productivity of knowledge...

...may be the guarantee of change, from a society which is manipulative (of people, of needs and its own aims) to a society which is even more smoothly manipulative. It may thus serve the reproduction of the relations of production beyond the mode of production from which those relations were born. This is merely a strategic hypothesis... (Lefebvre 1976, 74)

In interpreting this “strategic hypothesis”, we might be helped by Stuart Elden, who notes that “the French title of this work —*La survie du capitalisme* —is more ambiguous than the English,

because survive means 'afterlife' as well as 'survival'" (Elden 2004, 236). Perhaps Marx was right in the 'Fragment' to pose automation and the increased centrality of knowledge and innovation as the dissolution or transformation of capitalism beyond reprieve. But unlike the teleological post-Workerist reading of the fragment as revolutionary theory, Lefebvre remains more wary of the techno-optimism that permeates the second part of the Fragment. What if (as Marx seems to imply in the first part of the text) the relations of domination and processes of fragmentation survive in the automated systems, in the logics of calculation, in the 'programmed' spaces of ordering? Or put more crudely, can we really trust capitalism to self-collapse and leave us with all the good stuff, while at the same time bringing all the bad with it into its grave? Can we not end up with the opposite scenario? What if whatever comes after capitalism, capitalism 'afterlife', is even worse?

These hypothetical questions brings us back to Alberto Toscano's questioning of the supposed autonomy of the cooperative capacities of immaterial labor. For Lefebvre is, similarly to Panzieri and Alquati, concerned with the material aspects of machinic society outlined in the first part of the fragment, and especially of what happens as this machinic impetus extends beyond the immediate tools of production, increasingly permeating entire lives, neighborhoods, and cities.

Drawing on Lefebvre's reading of the Fragment, and Toscano's critique, we can begin to delineate a dystopic inversion of the biopolitical metropolis proposed by Hardt & Negri.⁷³ In this dystopic metropolis, urban space is increasingly recast into a form adequate for networked capitalism. This metropolitan form imposes on its citizens a constant demand to connect, communicate and interact through its landscape of proliferating interfaces – appearing more as a forced labor camp for (im)material labor, than a territory promising increasing autonomy. And while perhaps leading towards the end of capitalism as we know it, there are no guarantees that

⁷³ This can be read in conjunction with what Lefebvre would later come to call 'abstract space'.

this networked landscape would not provide the basis for a mode of production even more unamicable to collective freedoms and rights to self-management than contemporary capitalism.

To outline these two positions from a slightly different perspective, we can turn briefly to a conversation that took place between Gilles Deleuze and Antonio Negri in 1990. In this conversation, Toni Negri's suggested that perhaps communism is "less utopian than it used to be" in a society centered on communication and networked technologies (thus prefiguring what would eventually end up becoming Hardt & Negri's thesis on the biopolitical metropolis). In response to this claim, Deleuze retorted that "the quest for uni-versals of communication should make us shudder", adding that "creating has always been different from communicating" and that the key is to no extend systems of communication and control, but rather "to create vacuoles of noncommunication" (Deleuze 1990).

When Lefebvre speaks of the 'charade of interactivity' that he saw as characteristic of the emergent forms of information and communication technologies, he displays a similar skepticism towards any crude emancipatory hopes pinned to the development of networked technologies (Lefebvre 1989/2014). For Lefebvre, as for Deleuze, there is nothing inherently emancipatory about a digital networked communications. Yet, in treading the balance between optimistic and despotic views on technology we can find particular value in his work.⁷⁴ While Lefebvre sees how technology is central to the reproduction of the relations of production, neither the production of technology nor the production of space in his work, is reducible to a capitalist command. Rather, both technology and space are processes fraught with the conflicts

⁷⁴ In this sense, Lefebvre position is quite close to that of Andrew Feenberg, who against what he calls instrumental and substantiative perspectives on technology has argued for need to develop critical theories of technology. Such theories, for Feenberg, acknowledges that technology is not neutral, but at the same time refuses to accept a narrative that portrays technology as an autonomous and increasingly despotic force. Rather, a critical theory of technology involves reopening technology as a site of politics, or "as a scene of struggle", suggesting that technology cannot be neatly separated out from the social processes that it forms an intricate part of. (see Feenberg 2002, introduction)

and contradictions that characterize capitalist society more broadly.⁷⁵ Every attempt by capital to resolve such contradictions through the production of cohesion are therefore doomed to fail, and will always be met by new cracks in the pavement, and the opening up of new strategic sites of resistance.⁷⁶ In the light of this, Lefebvre's question of whether to collaborate with the urban general intellect or take the lead oneself appears as more explicitly concerned with finding what political strategies and emergent political pressure points might be effectively engaged with in this emergent techno-social landscape.

While this question might appear similar to the accelerationist position discussed above, it in fact it points in a distinctly different direction. While accelerationism nihilistically proposes to push capitalism beyond itself, Lefebvre and his attention to the spatial dimension offers an explosion of the teleological reading of the Fragment offered by post-Workerist and Accelerationists. Lefebvre recognizes that we cannot go back, but at the same time sees how we cannot simply go through and with capitalism. Just as nostalgia is not a viable political strategy, neither is an embrace of accelerated technological change and capitalist processes of creative destruction.

Space here, for Lefebvre, becomes a way of adding dimensions to the movement of the dialectic.⁷⁷ All of a sudden, we no longer simply move in terms of a singular historical transition from subsumption to emancipation, from one stage of techno-social production to the next. Rather, what emerges is a complex landscape constituted by the criss-crossing of different spatio-temporal trajectories, scales, and forms of exploitation, which in Lefebvre, all more or less

⁷⁵ Not counting the significant philosophical differences, Lefebvre's position here, I would argue, is also quite close to that of Gilles Deleuze, both in its skepticism of any technological fetishism, but also in suggesting that technology can only be understood by situating it within a larger context (see, for example, Deleuze 1992).

⁷⁶ In the *Production of Space* (1991), Lefebvre would suggest that the homogenizing "abstract space carries within itself the seeds of a new kind of space ... 'differential space'"

⁷⁷ For a discussion of Lefebvre's spatial dialectic and its utility for mapping contemporary capitalism, see Fredric Jameson's *Valences of Dialectic* (2009) 66-70

become subsumed under a process of planetary centralization and peripheralization (cf. Brenner 2014). Whereas the post-Workerist post-dialectical framework presents as a surprisingly closed, singular and one-directional narrative, Lefebvre's dialectics offers an open, multiple and indeterminate becoming of an urban machinic society.

I want to conclude by revisiting the starting point for this thesis: the perceived need for new geographical frameworks or cognitive maps to help us navigate and act in the city of digital capitalism. A key reference point for such a project is Marx's Fragment on Machines, which has served as the basis for many theorizations of contemporary capitalism. However, by grounding their theorization of the metropolis in a tendential reading of the Fragment, Hardt & Negri, together with other post-Workerists help reproduce "the geographical imagination that accompanies the synecdochal characterisation of cities" (Massey 2007, 88). For Massey, this strategy of synecdoche – whereby one part of an urban economy is made to stand in for the whole – fundamentally serves to obscure the deep relationality and heterogeneity of cities (including many other elements of any urban economy). Mobilized in many contemporary urban redevelopment schemes, synecdochal representations suggest there is a singular figure, sector, or process that is 'the one to bet on' (or in Hardt & Negri's terms, 'the one to liberate').⁷⁸ The synecdoche thereby, as Massey has suggested elsewhere, reduces "geography into history, space into time" (Massey 2005, 5). Clinging on to the "cosmology" of the single narrative or tendency, this schema "obliterates the multiplicities, the contemporaneous heterogeneities of space. It reduces simultaneous coexistence to place in the historical queue" (ibid).

Taking the urban seriously involves introducing the multiplicity, relationality and becoming of urban space into the reading of the Fragment (cf. Massey 2005). Engaging with the dialectic between the two narratives of the Fragment *spatially*, rather than just *temporally*, I want to

⁷⁸ Negri in a recent essay suggested that "we are still dealing with a class, but a different one, and one endowed with a higher power. It is the class of cognitive labor. This is the class to liberate, this is the class that has to free itself" (Negri 2014).

suggest, opens the ground for developing a more complex and relational framework for navigating and acting in the contemporary metropolis. This ‘spatialized’ framework leads us away from some of the traps of tendential methods of analysis and accelerationist modes of politics and is, to borrow the words of De Angelis, better primed to “capture both the synchronic configuration and the diachronic dynamic of a heterogeneous body of labour in relation to capital“ (De Angelis 2006, 170).

8. CONCLUSION

This thesis departs from the common conception that cities today are becoming primary frontiers for the construction of techno-capitalist futures. In order to navigate and act in these emergent landscapes, we need to develop new urban cognitive maps that combine insights from different existing frameworks. I have here initiated such a ‘mapping’ project by pointing to Marx’s *Fragment on Machines* as a key text underlying a number of contemporary theorizations of the relationship between technology, capitalism and political subjectivity. In order to interrogate these theories, I have argued, we must return to the Fragment itself, tracing the ways in which it has been read into the contemporary moment. We must evaluate and question what the implications are of these readings for the politics of the contemporary digital city.

The (post-)Workerist reading of the Fragment has undoubtedly constituted the basis for a rich set of theoretical writings on the emergent forms of capitalist exploitation and the related figures of political struggle in the digital age. But it is a reading that, as I have argued in this thesis, also bears significant problems when used as the ground for a critical theorization of the contemporary metropolis (as in the case of Hardt & Negri’s *Commonwealth*). For these affirmative and tendential readings of the Fragment tend to enact a problematically capital-centered master narrative – one that embraces and objectifies the growing importance of machinic automation and knowledge-centered production as a step towards capitalism’s imminent self-implosion. As Steven Shaviro has suggested, theorists such as Hardt & Negri are a bit too enamored of the Californian ideology of informational productivity (Shaviro 2008). They thus run the risk of generating urban theorizations that legitimize rather than question the current wave of urban creative destruction launched on the back of a promise to further

augment the communicative and collaborative capacities of the contemporary metropolitan landscape. The challenge for a new critical urban theory is to expose the limits of such master narratives (whether in the form of ideologies of digital urbanism, or as theories of cognitive cooperation or technological acceleration), and shift focus to an analysis of the differential, fragmented and relational aspects that characterize the contemporary processes of planetary urbanization. Only by way of paying attention to the differential relation between those ‘most advanced sectors’ embraced by the tendential analyst, and the contemporaneous processes of displacement, dispossession and raw exploitation equally characteristic of present-day capitalism, can we hope to begin to delineate a political terrain (the emerging lines of antagonism, the strategic possibilities and constraints) of urban struggle in the digitalizing metropolis. As Lefebvre asks, do we really have to collaborate and reach a compromise with this “monster, Leviathan, Golem” that is the ‘general intellect’, or can we take the lead ourselves (Lefebvre 1974, 65)

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