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Time, Capitalism and Alienation

A Socio-Historical Inquiry into the Making of Modern Time

By

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Introduction

The Paradox of Modern Times

We live in strange times. Also strange is our relationship to time. The more we measure and organise it, the less we seem to control it. This basic paradox is all the more present with us today. While throughout history, most of humankind's means of temporal orientation were provided by celestial movements, the needs of our modern societies in terms of temporal precision now exceed the capacities for time-marking provided by a geocentric perspective on celestial bodies. Parallel to the emergence of a historically unique form of abstract time, a protracted social process of quantification and rationalisation of time has produced an important paradigm change in the history of time-systems and time-units: the natural referent of our social time categories shifted from the skies to the subatomic realm. A long way from rudimentary time-marking achieved by planting sticks in the ground, observing lights or measuring shadows, today's high-tech atomic clocks, which measure the second (officially 9,192,631,770 oscillations of a caesium atom) with an accuracy of better than one part in a hundred trillion, underpin a globalised time-system that structures our lives and activities to an unprecedented degree. And yet, time appears to us as this absolute force that operates independently of our wills.

The passage from the skies to the atoms also reveals that time systems change. But why such a change? A year, a day, an hour – are these not neutral objective categories predicated on celestial processes? After all, the sun rises and then sets, the moon follows its cycles, seasons pass by at regular intervals, and the Earth takes a year to go around the sun. Time-units appear simply as reflections of celestial processes. These processes have not changed, which raises the question: what made the skies an unfit basis for our contemporary temporal order, while they worked perfectly well for societies throughout human history? Could it be that societies have changed, and that these social changes have also changed time itself? Would this not further suggest that our time categories are, in a profound way, social artefacts?

Indeed, the 'unnaturalness' of time-units is somehow counter-intuitive. However, the limits of 'natural' definitions of the time-unit 'day', for example, are today well-known. They stem in major part from the imprecisions of the natural celestial and earthly processes we might use to measure it. This is worth considering. What is a day? How should we measure it? First, should we use a

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full rotation of the Earth relative to the distant stars (sidereal day), or relative to the sun (solar day)? These two actually differ by as much as four minutes. Then there is the problem of the Earth's speed of rotation, which is not uniform, but erratic, and altogether decreasing. This is due to several factors: the tidal effects of the moon, the distribution of air and water over the surface of the Earth, which tends to make its rotation accelerate in the winter and slow down during spring. Add to this the movement of the poles by a few metres each year, among other things. Still, for most of human history, the nature of the temporal needs of societies made it so that they could use various definitions of a day without eventually being confronted with the imprecisions mentioned here. The day had remained the main time-unit in most time-systems, with other shorter time-units deriving from it. Officially, the shift occurred in 1967, when the increasing need for precision of our modern temporal practices made these imprecisions of the category 'day' all the more apparent. From then on, the second became the basic time-unit. Whereas for most of its history, the second was a quantitative derivative of other time-units (1/60th of a minute, 1/3600th of an hour, 1/86400th of a day), it now forms the main time-unit from which the other ones are derived. As such, it had to find a basis in a natural process, or in other words, a natural process had to be ascribed the meaning of lasting for a second. Enter the caesium atom and the number of oscillations between the two hyperfine levels of its ground state. This process obviously does not bear more importance for the state of the world than any other; however, it has acquired a profound human relevance by its property of steadily having the same duration as our definition of a second.[1]

Yet, as noted, paradoxically – or even ironically – the more we organise and measure time, the more it seems to escape us. We live in strange times, and we live in an estranged time. We order our lives according to an abstract, impersonal and extremely precise temporal order, but the concrete experiences of our lived times often seem out of synch with the abstract character of our clock-based social time regime. It is as if our obsession with saving, measuring and organising time has gone hand in hand with our own temporal alienation. This book wishes to enquire into the sources of this paradox of modern times, which might very well be found in older processes reproducing the abstraction of time, rather than evolving out of the more recent shift from the cosmos to the atom.

1 See also Hannah 2009, p. 2; Aveni 2002, pp. 87–8.

Challenges and Problems

This is not the only paradox facing enquiries on time. Indeed, any endeavour on the topic of time has to find its way through another forceful conundrum: time is at once one of the broadest and richest topics, but also one of the most elusive. This stems from the fact, on the one hand, that time everywhere appears as a fundamental characteristic of existence itself, whether 'human', 'social' or 'natural'. As such, it is an aspect of any form of phenomenon – including thinking itself. Time is 'everywhere', as Aristotle once put it: this is also reflected in the fact that time is, after all, the most common noun in the English language. On the other hand, this very omnipresence of time makes it almost impossible to track down, to seize, to isolate and reduce to a definition beyond common-sense generalities. Indeed, it proves frustratingly difficult to encapsulate time within a concept, surrounded by neatly traced boundaries. In other words, time, as it were, is everywhere and obvious, and yet it remains stubbornly ungraspable as soon as one endeavours to study it. Augustine of Hippo, who spent a lot of time studying it, famously noted as much.[2] Perhaps this has to do with the fact that time is not a *thing*,[3] but rather a cluster of *processes* which defy standard conceptual thinking by their complexity, and by their very temporality.[4]

I would like to think that there is nonetheless light at the end of the tunnel, and that it is indeed possible to say meaningful things about time. However, in order to achieve anything of potent heuristic value, one must begin by taking a position on some overarching issues in order to delimit the scope inside which such a study can be read and – hopefully – reduce the risk of stumbling into metaphysical pitfalls. Two such issues demand brief preliminary remarks: one related to the concept of time itself, the other to the nature of critical scholarship and its take on time as an object of study.

First, this book argues that time is a *social* phenomenon. This means that any idea or practice of time comprises a series of social determinations and mediations. Human lives and social life do not *occur in* time; rather they *make* and

2 For Augustine, there was something of a distance between the inner knowledge of time and the actual conceptualisation of it: 'What then is time? I know well enough what it is, provided that nobody asks me; but if I am asked what it is and try to explain, I am baffled' (Augustine 1961, p. 264).

3 From a different perspective, Yuval Dolev provides, among other things, a powerful reflection on the ontological status of time (see Dolev 2007).

4 The term 'temporality' refers to the 'moving' and 'processual' aspect of time.

are made by time. Time is produced by and through social practices, and time systems, as well as the architecture of temporal relations, vary from one society or historical period to another. Since conceptions and practices of time are rooted in social practices, they require social and historical contextualisation. Time itself has a history.

Relatedly, the dichotomies between natural time and 'subjective' or 'experiential' time, or between 'natural' and 'social' time, which structure many theoretical discussions of time, are mostly sterile. My efforts instead go towards a synthetic account of *social* time in which human groups reproduce themselves, and develop conceptions and practices of time, in a way in which 'natural' time is always already socially mediated in human experience, 'social' time always encompasses a multiplicity of 'natural' and 'individual' temporal phenomena, and 'subjective' time is mediated by the simultaneously social and natural experience and constitution of human beings.

An important premise in what follows is that every society (re)produces fundamental configurations of social relations to time and social relations of time. This is the case at the economic level, as Tombazos puts it, where 'every economic organisation is, therefore, an organisation of time',[5] but also, more broadly, at the level of society, where social structures and relations comprise and produce time structures and relations. When societies change, time relations change as well. In Barbara Adam's words, 'each historical epoch with its new forms of socioeconomic expressions is simultaneously restructuring its social relations of time'.[6] Of interest here are these relations between the social organisation of the metabolic activities of human societies, and their conceptions and practices of time. How are these relations built and reproduced? According to which social logic(s) are time relations arranged? In what ways and to what extent do power and property relations interact with conceptions and practices of time? More specifically, this particular study examines the relationship between *time* and *capitalism*: it seeks to delineate some of the characteristics of capitalism's mode of social time and to examine how processes of capitalist value formation and appropriation affect and/or construct a historically specific relationship between an 'abstract' time-form (known as clock-time) and 'concrete' times (more on this in Chapter 3). In order to do this, one must not only look at functional and theoretical relationships between capitalism and time, but one must also historicise time relations and time regimes themselves. A detour through the history of clocks and clock-time therefore becomes indeed a *passage obligé* for any analysis of time and capitalism.

5 Tombazos 2013, p. 14.

6 Adam 2004, p. 125.

Time is social, then, and therefore time is also political. Accordingly, time is in need of a de-reifying critique: not a 'thing', a natural object, or a neutral ('given', 'ahistorical' and 'asocial') universal feature of human consciousness; time is rather a locus of struggle over meanings and practices, and as such can function as a powerful political and ideological tool. For example, treating time as a universal, natural *thing*, as a non-malleable objective given, or as an abstract and linear succession of empty quanta, tends to deny human temporal abilities and timing powers. As people cannot shape time, they cannot shape their history, and historical and political change is disconnected from human agency. Along similar lines, Peter Osborne speaks of a 'politics of time':

> I write of a 'politics of time'; indeed, of all politics as centrally involving struggles over the experience of time. How do the practices in which we engage structure and produce, enable or distort, different senses of time possibility? What kinds of experience of history do they make possible or impede? Whose futures do they ensure? These are the questions to which a politics of time would attend, interrogating temporal structures about the possibilities they encode or foreclose, in specific temporal modes.[7]

Such reflections on the 'politics of time' provide an important thread in the weaving of this book.

Second, brief remarks should also be made right away regarding some orientations of critical scholarship on time. Clock-time hegemony has been so pervasive in the modern Western temporal experience that critical scholarship on the topic has been driven to focus on the 'multiplicity' of time,[8] or on 'marginalized' times,[9] in order to challenge this hegemony. Accounts of clock-time as 'economic time' and 'commodified time' have even sometimes been declared 'old-fashioned', or out of date.[10] What is declared necessary now is for critical scholarship either to give a voice to temporal experiences that are (were?) marginalised by clock-time, or to recognise that the empire of clock-time is

7 Osborne 1995, pp. 199–200.

8 Adam 1995 and 2004; Hassan 2009.

9 Donaldson 1996; Gupta 1992; Leccardi 1996, among others.

10 Carmen Leccardi bases her plea for a focus on women's time on the 'irreversible undermining' of clock-time's hegemony. Although I share her conviction that women's time must be analysed, her diagnosis of the fall of clock-time's hegemony seems to be based on an analysis of the relationship between clock-time and 'the mode of industrial production' that lacks theoretical and historical depth (see Leccardi 1996, pp. 170–3). See also Glennie and Thrift 1996, p. 276; Hassan 2009; Adam 1995, pp. 94–9.

no longer in existence in our 'post-modern' world, and accordingly focus the analysis on temporal multiplicity.[11]

Concerning the 'voice' of marginalised times, the problem can be formulated as follows: the focus of this book is – to a great extent, but not solely – on capitalist abstract time; it therefore runs the risk of understating or even obscuring the richness of social times, or ignoring the marginalised social experiences of time. Two brief points might clarify my position on this issue.

First, it remains crucial to think through the hegemonic form of time in capitalist societies in order to better address the nature and forms of temporal marginalisation, alienation and oppression. Moreover, as will become clear in what follows, retracing the historical and theoretical implications of the relationship between capitalism and clock-time does not necessary lead to a marginalisation or a silencing of 'other' times, but rather can lead to a better understanding of the relationship with capitalist abstract time that produces their very otherness.

Second, a historically informed account of the rise to hegemony of clock-time might actually clarify many issues which have been under-theorised, or treated a-historically, by critical scholarship on social time. For example, it can help go beyond the simple statement that nowadays 'time is money', in order to actually show *why* it is so, in contrast to most of the literature on the topic which mentions, or hints at, 'rationalisation' processes and 'economic efficiency', without providing more robust theoretical and historical rooting of its analyses in actual processes of capitalist commodity production and value formation.[12]

In other words, it seems rather a hasty move by many critical studies on social time to emphasise the need for social theory to go beyond the 'paradigm' of 'economic' time in order to highlight the multiplicity of social times.[13] It is hasty because, on the one hand, conceptions of 'economic' time are not 'paradigmatic' at all. In any case, this so-called 'paradigm' is based on very little actual theoretical and historical analyses: clock-time itself often seems to

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11 The specific question as to whether clock-time hegemony is a thing of the past is not one that I investigate in detail in the present study. The effects on contemporary temporalities of processes related to the neoliberal restructuring of capitalism since the 1970s, as well as the technological developments in recent years, will form the object of a future study. For more direct discussions of such issues, see Hassan 2009, Crary 2013, and to some extent Jameson 2009, among others.

12 For example, Rifkin 1987; Adam 1995, pp. 84–106.

13 See Glennie and Thrift's criticism of 'standard' narratives of clock-time, Glennie and Thrift 2009, pp. 47–62.

be taken for granted, and not in need of more comprehensive historical and theoretical enquiries. It is one thing to use the expression 'commodified time', yet it is another to ground it historically, conceptually and theoretically. Many authors, who engage with this problem, for all their merits, rarely go beyond generalities borrowed from mainstream economics,[14] or problematic accounts of the nature of capitalist social relations and social time.[15] For example, it is not enough, and as a matter of fact it is incorrect, to assert that industry 'creates' abstract clock-time.[16] A historical and theoretical study might help delineate the *historical* and *theoretical* relationship between capitalism and time. Moreover, although the literature on social time has indeed raised the question of the commodification of time, historical-materialist studies of this question were, until very recently, rather scarce, save for the pioneering work of Marx himself and the important subsequent theoretical work of Lukács (1971). Later significant contributions – such as the magisterial study by Moishe Postone (1993), the important work of David Harvey on the spatio-temporality of capitalism, and a thoughtful analysis by Fredric Jameson (2009) – have even more recently been significantly enhanced by two important contributions by Tombazos (2013) and Tomba (2013).[17] To this stimulating literature must be added a concise but brilliant analysis by Fischbach (2011). These contributions convincingly show that much remains to be said not only about our modern relationship to time, but also about clock-time itself, and furthermore that historical materialism is a pertinent conceptual toolbox in this regard.

Relatedly, if all critical scholarship were to abandon the 'paradigm' of clock-time in order to bring marginalised times to greater attention, this would not mean that commodified time could be wished away. The danger here is of downplaying the totalising tendencies behind the commodification of time in

14 Adam 1995, pp. 100–5.

15 Giddens 1979, 1981 and 1984.

16 Leccardi 1996, p. 170.

17 A superb introductory chapter to David Harvey's work is provided by Sébastien Rioux (in Martineau 2013). Analyses by Sewell (2008) and Castree (2009) are also very helpful. More on Postone in Chapters 2 and 3. For a good introductory text on Postone, see Dufour and Gheller (in Martineau 2013). Jameson's engagement with Paul Ricoeur's work – which in any case does very little to challenge Ricoeur's a-historical reading of the 'aporia' of time – will be dealt with more extensively in an upcoming article. The contributions of Tombazos and Tomba were published after I finished writing this study; however, I have had a chance to add some references to their important work. The same goes for Fischbach's book, which was brought to my attention just before sending this book to press.

capitalist societies, which remains a highly important form of temporal alienation today. The point here is to be able to provide an analysis of social time in a way that both emphasises the commodification of time – by mobilising non-dogmatic historical-materialist concepts and insights about value formation and appropriation in capitalist societies – and also treats the commodification of time not as a once-and-for-all event, but as a conflictual *process* implying a tendency by capitalism to create and reproduce an abstract time framework which alienates, subsumes, reduces and abstracts from concrete social times, *while being contested and resisted* by women and men as embodied historical agents thriving for the reappropriation of their concrete times, bodies and lives. Such a focus on time as a dialectical process under capitalism can provide the analysis with an emphasis both on the tendency of capitalism to commodify time, *and* the irreducible substratum of 'multiple' concrete times that make up the social fabric. In this sense, mobilising women's time, for example, can be made without losing sight of the ongoing struggle between women's time and a male-centred hegemonic time.[18] Mobilising workers' concrete times can also be done without losing sight of its alienating other: the commodified abstract time produced and reproduced by processes of capitalist value formation and appropriation. Mobilising non-Western conceptions and practices of time goes hand in hand with the assessment of the main features of what these times have historically struggled against in the process of imposition of Western time-forms on other parts of the world.

A thorough examination of capitalist time acts as a stepping stone that sheds light on the nature of 'multiple', 'concrete', 'obscured', or 'marginalised' times. In other words, it aims to show *why* they are marginalised, what processes govern their silencing, and how embodied temporal resistance to these processes is never completely shut down. It is in identifying abstract clock-time as a *tendency*, inherent in capitalist processes, which has become hegemonic, that one can better understand the fate and the nature of 'other' times and the processes that preside over their marginalisation. From this perspective, shedding light on marginalised times, and examining, both historically and theoretically, the nature of the hegemonic form of time under capitalism, are not mutually exclusive.

This book is structured in the following way. Chapter 1 addresses some of the conceptual and methodological implications and bases of this study. I discuss

18 On women's time see also the work of Karen Davies (1990, 1994).

the concepts of alienation and reification, and assess methodological issues in the field of the history of social thought, which underline my discussions of conceptions of time. Perhaps new heuristic light can be shed on these concepts and issues. The chapter then moves on to the more specific literature on social time, providing a brief overview of this literature in the social sciences, before ending by assessing and critically engaging with two of the most influential and insightful writers on the topic of social time: Norbert Elias (1992) and Barbara Adam (1995, 1998, 2004). This discussion clears a lot of ground with regards to the definition of the concept of social time, and sets the stage for the explorations that follow in the remainder of the book.

Chapter 2 analyses the emergence of a specific form of social time: clock-time. I engage with the literature on that topic, and argue that the birth and relative spread of clock-time from the medieval to the early modern period did not result in it becoming the hegemonic form of social time. I analyse the social embedment of the historical origins of clock-time in medieval Europe, as well as the historical process of the relative setting up of what I call a 'temporal infrastructure' of clock-time in the Western European region – especially in England. In parallel, the chapter provides a historical narrative of the transition from feudalism to capitalism in the English countryside. I then move on to an interpretation of Isaac Newton's conception of time in light of its social context of formulation. Newton's intervention is rooted in this transitional phase both at the level of the transition from feudalism to capitalism, and at the level of the transition from 'pre-capitalist social time' to 'capitalist social time'. These qualitatively different configurations of conceptions and practices of time I conceptually refer to as different *social time relations*.

Chapter 3 proposes an account of the relationship between capitalism and time. I assess the rise to hegemony of clock-time in a capitalist context by investigating its relationship with capitalist value. In order to do so, I start by refining my concept of clock-time, and then evaluate the temporal aspect of Karl Marx's theory of value by exploring the time-form in which it is embedded. I then move on to a mature industrial capitalist setting in order to address the relationship between industrial capitalism and the rise to social hegemony of clock-time, a process reaching its zenith in the establishment of World Standard Time in the second half of the nineteenth century. Accordingly, I revisit problems raised in chapter 2 on the socio-historical origins of a specific form of abstract time, i.e. clock-time. I enquire into whether there is such a thing as a 'capitalist time'. I also engage with the questions of historical sequence: did capitalism develop its own form of time and reconfigure social time 'after its own image', or did capitalism absorb an already developed form of social time and make it an increasingly hegemonic aspect of social life?

I then go on to discuss the issues of the alienation and the reification of time in capitalist societies, before tracing the contours of some temporal aspects of contestation and resistance under capitalism.

By asking the question of time, the following study is also confronted with the question of the relationship between thinking processes and writing, and therefore with the question of its own transience. As a matter of fact, writing on any topic forces one to interrupt the very *process* of thinking, to abstract from the temporalities of thought processes in and of themselves, in order to write down when and where thinking stands at a specific moment of reflection. In this sense, it is difficult to avoid a certain form of reification of thought in the interaction between the process of thinking and the process of writing. Writing traces boundaries, so to speak, which themselves become new launching ramps for further endeavours. As such, what follows, not least because it asks the question of time, should be read in this light: the guiding threads are attached to some milestones that have emerged along the way in my thinking through these questions. In no way should this be read as definitive or once-and-for-all answers to these profound and challenging questions. Rather, I start climbing, in the following pages, the very first steps of a ladder which counts many more, and I hope my thinking through the problem of time will continue to move toward more meaningful understandings.

CHAPTER 1

Theory, Method, Time

1 Alienation, Reification, Method and Time

Mapping a conceptual path towards understanding social time relations in capitalism requires an initial examination of two necessary conceptual tools: *alienation* and *reification*. These two concepts evolve inside a common horizon of meaning, and are connected in important ways. In terms of their level of generality, alienation is the broader concept, reification being one of its variants, or forms, at a lower level of generality.[1] More specifically, while alienation is related to *class* societies, reification is a form of alienation specific to *capitalist* societies.[2] These concepts will be broadly defined here, before being discussed again later from the perspective of time.[3]

From Species Being to Alienation

When Marx encountered political economy in late 1843 and early 1844, he was evolving in the intellectual context of the 'Young Hegelians' movement. Some stress his close philosophical relationship with Ludwig Feuerbach in that period,[4] and his chief rivals included thinkers such as Bruno Bauer and Max Stirner, notable Young Hegelians.[5] Marx was familiar with conceptions of alienation developed in this tradition. Indeed, to take one example among other Young Hegelians, Feuerbach had developed a critique of religion articulated around two of alienation's characteristic ideas: the *independent existence* of something of *human origin*. Indeed, deity for him was such a thing possessing an independent existence, while being of human origin. As one scholar succinctly puts it, for Feuerbach, 'God' was 'purely a *human projection* stemming from man's need for denotation and an *object independent of himself*'.[6]

1 For an insightful discussion of the level of generality, or level of abstraction, see Ollman 2003, pp. 59–112.

2 See also Lukács 1971.

3 This section proposes working definitions of some key concepts. Importantly, throughout the study, these concepts gain in consistency and delimit more precisely their scope according to the movement of the enquiry.

4 For example, Althusser 2005, p. 35.

5 See among others *The German Ideology* and *The Holy Family*.

6 Kohout Lawrence 2008, p. 6, emphasis added.

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In a nutshell, for Feuerbach God was a human creation, endowed with a power of its own, which ended up dominating – even creating – its creators. The influence of concepts of alienation on Marx is seen chiefly in the latter's early political writings: it can be argued that Marx's critique of Hegel's philosophy of right moves in the direction of identifying the state as a form of alienation. Humans' social powers are alienated and turned into political power, concentrated in the state.[7] In 1844, Marx's becoming aware of Friedrich Engels's contribution to the *Deutsch-Französische Jahrbücher*[8] helped him to broaden his conception of alienation. Alienation was not only found at the level of religion and the state, but also characterised social relations between producers and appropriators in class societies.

A series of propositions with regards to humans, and the relationship between humans and the world, underlines Marx's theorisation of alienation.[9] First, a distinction is made between natural and species 'man' [sic], a distinction that amounts to the contrast between the 'animality' and the 'humanity' of humans. Human beings are animals, in the sense that they possess natural powers, instincts and interests shared with other beings in the animal kingdom, such as eating, procreation and sleep. But these natural impulses are not merely animalistic in human beings since they, unlike other animals, are conscious of themselves as beings. That humans possess such a consciousness makes it possible for them to recognise other human beings as such. This characteristic, coupled with a sense of time,[10] or the capacity to incorporate the dimension of time into the thought process leading to their activity, participates in defining humans as a species being.[11]

The second set of propositions is concerned with the relation between humans and the world, and further refines this notion of 'species being'. One

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7 Contract theorists such as Hobbes and Locke had already defined the state as the alienation of men's natural right in order to gain security. However, Marx's conception discusses this alienation critically. Consider also Marx's discussion of Hess's idea that money is a form of alienation, articulated in 'On the Jewish Question'.

8 Written in late 1843 and early 1844, Engels's 'Outlines of a Critique of Political Economy' greatly influenced Marx.

9 See the discussion in Ollman 1976.

10 As will become clear, this 'sense of time' can take varied forms from one culture to another.

11 See the discussion in Ollman 1976, pp. 73–130. Incidentally, 'species-being' is another of Marx's Feuerbachian inspirations. In this broad discussion, however, it needs to be pointed out that ideas about the incapacity of animals to be conscious of themselves as beings and to recognise others as beings can be challenged by developments in the fields of evolutionary biology, animal studies and ethology.

fundamental aspect of the relationship between humans and their worldly environment can be grasped through the concept of activity. This concept sums up the three moments through which humans and nature are in relation: perception, orientation and appropriation.[12] Through this practical activity, a transformative engagement with nature that takes on historically specific forms, humans produce their own objective world, and as such they are species beings:

> It is just in this working-up of the objective world, therefore, that man first really proves himself to be a species-being. This production is his active species-life. Through and because of this production, nature appears as his work and his reality.[13]

At first glance, this relation could be understood somehow crudely as a subject-object relation, i.e. 'subjective' humans engaging with 'objective' nature. In fact, humans' relations to nature are much more complex. First, humans are an evolutionary product of nature, and as such they are part of it. The very definition of humans *qua* species beings is based on this interweaving with the natural world. Second, the proposition concerning the 'naturalness' of humans also applies if the terms are reversed. Indeed, while humans are 'natural', nature is also 'human'. For one thing, it is transformed – to say the least – by human activity. Moreover, 'nature' as a category of thought is tainted by human ideas and practices: the way humans think and engage with nature is always mediated by cultural constructs. Finally, once we say that humans must transform nature to live, since nature is not given to them in an already adequate form for their survival, we must acknowledge that as humans shape their environment, this activity shapes them in return. Such practical activity, which shapes both the actors and their world, partakes in what makes humans specific as a species. In other words, nature and humans are *internally related*, while it remains possible, of course, to draw distinctions between them, since they are not the *same*. As such, humans and nature cannot be conceived of as subject

12 Ollman 1976, pp. 85–93. In the context of the relationship between humans and nature understood in a more universal manner, Marx does use the term 'activity'. In Marx's later writings, the concept of activity is progressively replaced by the concepts of work and labour, as Marx moves to the analysis of the specificities of capitalism.

13 Marx 1988, p. 77. I am aware of, and I reject, the gendered implications of the use of the masculine pronoun-as-universal (either 'man' or 'his', etc.) in this quotation. This applies to every quotation used in this book that displays this characteristic.

and object, as *a priori* separated entities – nor can they be seen as being purely identical.[14]

From this discussion emerges another crucial point: humans cannot be seen primarily as separated atoms, as individuals, since their productive activity occurs in settings of organised groups. Echoing Aristotle, Marx affirms that 'The human being is in the most literal sense a *zoon politikon*, not merely a gregarious animal, but an animal which can individuate itself only in the midst of society'.[15] Sociality therefore precedes individuality: humans as species beings are political – social – animals. Sociality and activity also give rise to culture, to systems of meaning that relate humans to each other and mediate the internal relation of humans and their world. Humans are humans through their labouring activity, their internal relation with nature, their sociality and culture. Their species being is predicated on their social organisation with others in their culturally mediated interaction with nature and their world, in order to (re)produce their means of life, their environment, their 'objective world', meanings, and develop their potential as world-making beings.[16] It is in this very relationship between humans and their world, and ultimately in what makes humans human, that Marx's concept of alienation should be situated.

In its most simple and general form, 'alienation' has its roots in making what is one's own alien by selling it, or giving it away. It thus speaks to a loss, a severance from a part that becomes alien, as well as to the independent power that such a lost part acquires over one's own existence. In Marx's writings, alienation is a concept that applies to a fairly broad level of generality, although, very importantly, it does not apply universally or transhistorically. From its articulation with human labour, alienation in Marx is a concept that applies to class societies.

Marx's discussion of alienated labour, in the *1844 Manuscripts*, examines three interrelated forms of alienation.[17] The first is the alienation of the producer from the product of her labour, which then confronts her as something alien, something outside of her:

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14 For more on the idea of 'internal relations', see Ollman 1976. For more on nature as a human category, see Lukács 1971. Marx speaks of the 'identity of the subject, humanity, and of the object, nature', which should not lead one to 'forget' their 'essential difference' (see Marx 1973, p. 85).

15 Marx 1973, p. 84.

16 Importantly, Marx's position entails that the objective world is always already historical, since the conditions through which humans interact with nature are always historically specific.

17 Marx 1988, pp. 75–6.

> [T]he alienation of the worker in his product means not only that his labor becomes an object, an external existence, but that it exists outside him, independently, as something alien to him, and that it becomes a power on its own confronting him; it means that the life which he has conferred on the object confronts him as something hostile and alien.[18]

The second is the alienation of labour itself, of specifically human activity, or 'self-estrangement', where human activity becomes external to the producer. This objectified human activity escapes the power of its producers. Hence thirdly, alienated labour, by alienating the object of labour and human activity, alienates producers from their species being, 'in tearing away from man the object of production, therefore, estranged labor tears from him his species life'.[19] Whereas Marx feels that human activity should be an end in itself, that is, the free creation by humans of their own world, alienated labour turns this activity into a mere means to subsistence. In class societies, producers are diminished in their human possibilities in that they cannot attain the fulfilment of their capacities and potential. They are also unable to fully interact with their fellow human beings as species beings. In other words, alienation prevents humans from accomplishing their species nature through their species activity, from experiencing their objective world as their own creation, and from developing their potential as world-making social beings.

Importantly, here Marx should not be read as positing that alienated labour estranges humans from an *a priori*, transhistorical and universal 'human nature'. Rather it estranges them from historically specific human possibilities, from historically specific forms of creativity and freedom. Humans are not alienated from their 'true', 'eternal', 'universal' and 'unchanging' 'human nature', but from socio-historically created possibilities of fulfilment and development. What is part of human nature might be said to be a *potential* for creativity, fulfilment, expression and freedom, but these potentials can only be actualised in specific socio-historical contexts. Apart from such potentialities – that need not be essentialised either – and world-making abilities, 'human nature' is socio-historically variable, and has no universal or transhistorical content.

This preliminary discussion of alienation suggests that alienated labour is a characteristic of class societies, in which labour and/or its products are appropriated by one group of people through various socio-historically constituted means of appropriation. Such a process of appropriation entails the alien existence of historically specific potential features of human beings' social and

18 Marx 1988, p. 72.

19 Marx 1988, p. 77.

species nature, which confront them as alien forces. In short, in class societies, what belongs to producers is taken away from them. We will later enquire more specifically into the question of the alienation of time, or of humans being stripped away of their time, and will evaluate the differences in levels of generality between alienated labour, which applies to class societies, and alienated time, which might very well be a feature more specific to capitalism.

Reification and the Fetishism of Commodities

While alienation is a feature of class societies, reification is found in a specific form of class society: capitalism. Simply put, reification refers to the systematic transformation of processes and relations into *things*. Reification is as much an objective process predicated on the functioning of capitalist markets, as it is a subjective experience in which processes and relations appear to agents as things. Marx famously referred to the experiential aspect of reification as the 'fetishism of commodities'.[20] He used this notion to highlight how the operations of capitalist markets conceal social relations between humans. While fetishism appears in many forms in different societies where people ascribe human – or supernatural or divine – properties to things, the fetishism of commodities under capitalism has producers experience their own productive and creative powers as properties of commodities, these 'very strange thing[s], abounding with metaphysical subtleties and theological niceties'.[21] In short, in capitalist societies, the relations between producers appear as relations between commodities. This form of appearance is necessary; capitalist societies are structured around the production of commodities *for exchange*. This structural specificity of capitalism makes it so that commodities are produced and circulated through impersonal market mechanisms and alienated from their producers. They are later bought and consumed by people – based not on their needs, but on their capacity to pay – who do not experience or even know about the social relations between human labours that produce and circulate these commodities. This 'mysterious character of the commodity-form', says Marx,

> consists therefore simply in the fact that the commodity reflects the social characteristics of men's own labour as objective characteristics of the products of labour themselves, as the socio-natural properties of these things. Hence it also reflects the social relation of the producers to the sum total of labour as a social relation between objects, a relation

20 Marx 1976, pp. 163–77.

21 Marx 1976, p. 163.

> which exists apart from and outside the producers. Through this substitution, the products of labour become commodities, sensuous things which are at the same time suprasensible or social . . . the definite social relation between men themselves . . . assumes here, for them, the fantastic form of a relation between things . . . to the producers, therefore, the social relations between their private labours appear as what they are, i.e. they do not appear as direct social relations between persons in their work, but rather as material relations between things.[22]

The fetishism of commodities, the experiential side of reification, therefore appears as a result of the commodification processes that emanate from the capitalist value form. This speaks to the fact, as Lukács emphasised, that the commodity relation under capitalism is not just about transforming all 'use-values' into commodities. As the commodity relation and market structures become the dominant forms of valorisation and resource allocation, humans themselves become commodities – *qua* labour power – and reifying processes affect bodies as well as psyches:

> It [reification] stamps its imprint upon the whole consciousness of man; his qualities and abilities are no longer an organic part of his personality, they are things which he can 'own' or 'dispose of' like the various objects of the external world . . . and there is . . . no way in which man can bring his physical and psychic 'qualities' into play without their being subjected increasingly to this reifying process.[23]

Commodification stands at the basis of processes of systematic reification, through which not only relations between humans appear as relations between things, but humans themselves are commodified and reified. The fetishism of commodities and reification thus go hand in hand, as results of commodification, which in turn is a form of alienation in which human labour power and its products become commodities that are bought and sold on the market. Since it is commodities that are the bearers of value on the market, human activity therefore becomes subordinated to its alienated products. As McNally summarises,

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22 Marx 1976, pp. 165–6.

23 Lukács 1971, p. 100. Lukács goes on to explore how modern philosophy springs from the reified structure of consciousness (Lukács 1971, pp. 110–11ff.).

> commodity fetishism involves social practices that abstract the values of commodities from the concrete, embodied activities ('concrete labours') of the human agents who produced them. The result is a process of *real abstraction* through which concrete activity becomes subordinated to its abstracted (and alienated) forms of appearance. In the commodified world of capitalism, the system of commodity exchange revolves around the most abstracted form of value – money – while 'forgetting' its roots in concrete human labour. As a result, labourers are confronted by a world of commodities which, while of their own making, nonetheless stands over them and dominates them.[24]

In summary, alienation occurs when objectified forms are appropriated through historically constituted means of appropriation that strip away and separate forms and products of human activity from their producers, and make these forms and products appear as something independent, alien, something belonging to an outside force over which agents have no control. Reification, for its part, is a specific form of alienation occurring in capitalist societies, where commodified human activity becomes a thing that is bought and sold on the market, and commodified social relations take on the form of relations between things.[25] Reification is experienced as the fetishism of commodities, where people ascribe human properties to commodities, and see these as possessors of powers which are in fact human social powers.[26]

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24 McNally 2004a, p. 155, original emphasis.

25 Lukács makes the point that reification is specifically a product of capitalism. The commodity form has to be socially dominant in order for reification to penetrate the inner fabric of social life. It is only in capitalism that commodity relations become dominant in society, therefore reification penetrates deeply into social life only under capitalism. However, he changed his stance on 'objectification' and other issues related to this work, in the preface to a new edition of *History and Class Consciousness* written in 1967. In terms of levels of generality, we could say that while objectification is a transhistorical feature of human activity, alienation is a feature of class societies, and reification and the fetishism of commodities are features of capitalist societies.

26 Although reification is here situated as a form of alienation, it is possible to imagine fetishism without alienation. For example, if people were to 'fetishise', to 'bow down' before the products of their own labour and ascribe divine, human or supernatural powers to them, while not being separated from these products, this could very well be a situation of fetishism, but not one of alienation. Also, it is important to note that the attribution of *human* properties to commodities is but one form of fetishism. Fetishism often takes the form of the attribution of supernatural or divine properties – or any other property with a cultural meaning – to things.

This preliminary conceptual mapping shall be kept in mind for the analysis proposed later on, which will assess the extent to which social time relations are characterised by these phenomena (alienation, commodification, reification). The relationship between the value form and the alienation of time in capitalism will be enquired into, in the light of a reading of Marx's theory of value emphasising the question of social time. Whereas Marx asked why value takes on this form – money – in capitalism, we might ask why *time* takes on this form – a dialectic between abstract time and concrete times – in capitalist societies. Indeed, capitalist social time relations entail the alienation of time, and as a result of processes of capitalist value formation, time becomes reified. What appears as the 'immediate' reality of time in capitalism is thus in fact the expression of a series of mediations in which time has become alienated and reified.

It thus seems more than overdue to work towards a de-fetishising and de-reifying critique of time. Time is better conceived of as a socially mediated relation between humans and their world. This social mediation is shaped by the social organisation of production and labour, and shapes it in return. Accordingly, time is not an immediate 'given', but only comes to human awareness always already mediated by the social context in which the particular individual or group is situated. Social time relations are shaped by human activity, they are closely related to the development of social life in general, and capitalism is characterised by the abstraction and reification of social time relations. In short, a first delineation of the concept of time points to the fact that it is not a *thing*; it is a *processual relation* between events, 'socio-natural' processes, activity and humans. The concept of social time, or rather *social time relations*, is discussed more in depth below.

Method

This study of time stands at the crux of many methodological issues, notably one which has occupied centre stage in debates in the field of the history of political thought, but that has broader implications for social sciences: the relationship between ideas and context. Neal Wood and Ellen Meiksins Wood's social history of political theory provides a helpful framework to address these issues.[27] I build on their insights in two specific ways. First, while their method aims at relating political theories to specific socio-historical contexts of formulation, the insights it provides can also enhance the analysis of ideas that might not specifically pertain to a 'political' theory. For example, Isaac Newton's concept of time, even if not specifically rooted in a 'political theory' *per se*, is still connected to socio-historical development, as will be discussed

27 Wood 1978 and 2002; Meiksins Wood 2008 and 2012.

later. The outlook of the social history of political theory allows for a critical discussion of such concepts that shows how they display and embody social and political aspects.

Second, studying the historical evolution of conceptions requires a comparatively higher level of generality in the treatment of social context than examining one author's, or group of authors', general theory in a given socio-historical period. In addition to paying attention to the specific social context of an author or a group of people, I analyse more general social practices that give rise to, and are shaped by, fluctuating conceptions of time. As such, instead of seeing the history of conceptions of time as driven by a purely discursive logic, explanatory power is attributed to social facts. They are put in contact with contexts of social practices in order to show their character as social artefacts. In this way, the social history of political theory provides a fundamental outlook which is further adapted to the specific object under investigation here.

In the case of the relationship between conceptions of time and capitalism, aspects of István Mészáros's most recent work on the social determination of method are also of interest. He shows how the social context of capitalism produces specific methodological characteristics which underpin various systems of thought formed within such a context. Mészáros identifies major features of methodologies under capitalism, and relates these to inescapable elements of the totality of social relations under capitalism, as well as the specific standpoint of capitalism from which theories are constructed. Of course, the methodological articulations of theories vary to a greater or lesser extent according to specificities such as national settings, conditions of social interaction and varying configurations of power relations, different traditions and, I would add, different institutional settings of knowledge production. Yet, there are still general methodological trends that are associated with systems of thought that are: (1) in dialectical relationship with capitalist social processes; (2) based on the reification of social relations; and (3) based on a corresponding reification, in thought, of both 'subjects' and 'objects' of knowledge. Among the methodological characteristics typical of a capitalist context, one finds the attribution of a key role to 'natural' science, a general tendency to formalism, a commitment to methodological individualism, the suppression of historical temporality, the imposition of dualist categorial matrices, and the abstract postulates of unity and universality in place of real mediations.[28] These methodological features are found to varying degrees in the concept and the study of time in modern scholarship.

28 Mészáros 2010, pp. 39–276.

The relationship between conceptions and practices of time, as more broadly the relationship between ideas and contexts, can be described, following Mészáros's expression, as dialectical reciprocity. Rather than obeying some fixed laws of mechanical causality, this relationship is a dynamic of co-constitution in relation to a social whole. This implies that one studies ideas and conceptions not only based on their immediate appearance as forms of meaning, but also that one demystifies their very form of appearance by relating it to its conditions of formulation and to instances of social mediation. Ideas and material contexts should not be approached as discrete and distinct 'things', but rather as relational parts of a totality in process, of a socio-historical whole. This means the privileging of a relational ontology.

Seeking the social determinacy of ideas is therefore not a reductionist endeavour. Quite the opposite, it is to open up the world of ideas and meaning to social reality and materiality, to see the interpenetration of materiality and meaning in human activities, and ultimately to enrich our understanding of ideas by broadening the scope inside which they are addressed. Furthermore, 'determinacy' or 'determinism' is not to be understood as a mechanical relationship, or as a relationship between one active and one passive element. 'Determination' does not have to be understood as a rigid and inescapable set of constraints imposed on people, on practices, or ideas. As Harry Braverman once put it, 'social determinacy does not have the fixity of a chemical reaction, but is a *historic* process'.[29] Determinism, in this sense, refers to the manners in which configurations of social relations set limits and exert pressure on human individual and collective agency.[30] For instance, the logic of capitalist reproduction tends to set a more or less broad array of possibilities for social actions, behaviours, and agencies. It also sets limits for such social actions and behaviours, and pressures individual and collective agents into adopting certain forms of subjectivity. It does so by tracing the economic, legal, ideological and political contours of the reproduction of society, these contours in return allowing and rewarding certain behaviours and certain forms of actions humans can undertake to reproduce themselves, while discouraging, condemning or proscribing others. But, crucially, human agency and ideas are always at work pushing those limits back and forth, and resisting, transgressing, as well as coping with those pressures. People have agency, but their agency does not evolve in a social void, nor is it a manifestation of an underlying 'human nature'. This agency is rather socio-historically fluctuant, as it is inscribed in, through, and against structuring effects coming from social conditions.

29 Braverman 1974, p. 21, original emphasis.

30 See also Raymond Williams's discussion of determination (Williams 1977, pp. 83–9).

Social determinations pose certain questions, articulate certain problems, and interact with discursive environments and intellectual and cultural traditions to provide a background against which historical, thinking creatures create meaning and ideas. These meanings and ideas are social products and have social 'effects' as they, in turn, shape behaviours, agencies and conditions. Conceptions and practices of time are in such a co-constitutive relationship, as the materiality and the meaning of time coalesce in social time relations.

2 Time in the Social Sciences: 'Social Time'

From the very beginning, modern social sciences have been interested in the topic of time. Indeed, 'the founders of the social sciences', says Barbara Adam, 'have been concerned to encompass time in their respective theories'.[31] Adam points to the theories of Karl Marx, Max Weber, Émile Durkheim, George H. Mead and Alfred Schütz, among others. In a similar fashion, Gerhard Dohrn-van Rossum notes that time and the various concepts related to its understanding as a social phenomenon have been 'important themes of historical and anthropological research'.[32]

Classical social theory indeed has a lot to say about time. So much so that it is beyond the scope of this study to provide a comprehensive review. However, some key contributions can be highlighted. While Karl Marx will be dealt with in more depth later, the two other founders of modern sociology, Max Weber and Émile Durkheim, have provided fundamental insights into the study of social time. Max Weber, for one, took time seriously enough to integrate its organisation, and the cultural attitudes towards it, as a causal factor of social structuration and social change. He established time-consciousness as an important topic in the study of historical mentalities and the development of modernity.[33] Some of his most insightful headways are made in his treatment of the role of the Protestant ethic and the specificities of its conceptions and

31 Adam 2004, p. 22.

32 Dohrn-van Rossum 1996, p. 2. Some other notable contributions toward addressing the problem of time from a sociological perspective include: Bourdieu 1972, 1977, 1980; Giddens 1979, 1984; Luhmann 1976; Mead 1934; Schütz 1971; Kern 1983; Sorokin 1964, for whom social time-measurement was the 'most urgent need of social life', and as such an inescapable factor of social relations; and more recently, Postone 1993; Adam 1995, 1998, 2004; Glennie & Thrift 2009; Hassan 2009; Tombazos 2013; Tomba 2013, among others. See bibliography for more details.

33 See Weber 1964, and also Dohrn-van Rossum 1996, p. 10.

practices of time. Building on the famous quote by Benjamin Franklin in which time is ideal-typically presented as an economic and organisational resource, Weber also gestured to the fundamental distinction in social conceptions of time between this Protestant ethic and the conceptions associated with the medieval Catholic Church, in which time belonged to God and trade in time was forbidden.[34] More broadly, Weber drew connections between processes of rationalisation, which he saw as the main driver of modernity, religious ethics and doctrines of justification, a specific ethos of work, and the rationalisation of one's use of time. Such a nexus of conceptions and practices made time into a resource to be maximised and spent productively, and not to be wasted. Through this analysis, Weber put forward the idea that 'the spirit of capitalism' entails a particular relationship to time: what follows builds on this fundamental insight.

French sociologist Émile Durkheim, who was especially intrigued by conceptions and practices of sacred time, also made a crucial contribution towards understanding time as a social phenomenon. Starting from the premise of social facts independent from individual consciousnesses, Durkheim postulated a 'social time' that transcended individual experiences of time. Deeply influenced by Kant, Durkheim however reconsidered the rootedness of 'categories' in individuals. He did not conceive of time as an *a priori* category of thought present in individual consciousness: rather he thought of time as a collective category, originating in religious practices, and therefore rooted in the social: the nature of society, its collective life, symbols and concepts, make social time a collective feature. The indispensable guidelines of our time-consciousness, to paraphrase him, are found in social life, especially in religion.[35]

Importantly, Durkheim's conception identifies a way out of a dichotomous understanding of time, and conceives of time neither as a natural object nor a subjective category, but as a social artefact.[36] Rooting time in the social gestures towards the resolution of what Paul Ricoeur has called time's fundamental *aporia* between *cosmological* and *experiential* conceptions, between an 'objective-time-out-there' and a 'subjective-time-within-us', which I enquire about in more depth in an upcoming study.[37] Whereas Ricoeur wants to overcome the conceptual *aporia* by 'making time appear' through a study of narrativity, I follow the path opened by conceptions of 'social time'. As Paul Glennie and Nigel Thrift put it, 'time can no longer be seen as

34 Weber 1964; see also Le Goff 1977, pp. 46–79.

35 Durkheim 2007, pp. 48–61, 615–23.

36 See also Adam 2004, pp. 45–9; Miller 2000.

37 Ricoeur 1985.

"something out there" which frames us, as in the Newtonian *sensoria*. But neither is it a perception internal to human beings, "a purely subjective condition of our (human) intuition" '.[38] Society mediates humans and nature: accordingly, time is neither merely an object of nature, nor merely a feature of individual human consciousness: it is better conceived of as rooted in mediating social activities. These, in fact, are also time-making activities. In this sense, social theories of time reverse the common assumption that society is something that exists 'within time'. One should rather conceive of time as within society. As Robert Hassan puts it, 'time fundamentally exists within the social field; it is not an overarching cosmic universe, as Newton would have it, one that we exist within. Time is social, in other words'.[39]

Subsequent contributions from the social sciences have further developed this conception of time, which emphasises its character as an artefact, and recent contributions in the social sciences have made social time and temporalities the very object of their study. Sociological and historical research focuses on the social composition of this time, on how different practices and rhythms of social life create socio-historically variable and multiple collective times, and on how '[e]very culture', as Rifkin elegantly puts it, 'has its own set of temporal fingerprints'.[40]

Time *qua* social time is also increasingly seen as a way to bridge the gap between differentiated disciplines and fields of study. An interdisciplinary literature on time has emerged in the last few decades, and many thinkers and scholars nowadays endeavour to study the broad relationship between time and society.[41] Such contributions ask crucial questions for the social sciences and raise the issue of potential relationships between different disciplines and fields. Andrew Abbott, for example, illustrates the divide between history and sociology as one between the study of a 'past' and the study of the causal regularities that govern a 'present'. He then underlines several contributions, such as the work of Bergson, Alfred North Whitehead and Mead, which can help bridge the 'temporal' divide between these two disciplines,[42] and take us closer to interdisciplinary conceptions of 'a world in process. A world of interaction'.[43] Interdisciplinary time studies have also sought to connect natural and social

38 Glennie and Thrift 2009, p. 66.

39 Hassan 2009, p. 42.

40 Rifkin 1987, p. 9.

41 The foundation of the multidisciplinary journal *Time and Society* in 1992 is one illustration of the burgeoning of this field of study.

42 Abbott 2001, pp. 209–39.

43 Abbott 2001, p. 239.

sciences in interesting ways. J.T. Fraser, for example, proposes a thought-provoking multidisciplinary theory of time, which seeks to integrate six fundamental levels of integrative temporalities, called the 'hierarchical theory of time'.[44] Works in the emerging field of 'big history', such as the contributions of historian David Christian (2004), also illustrate these developments.

3 Norbert Elias, Barbara Adam and Time Studies: Towards a Concept of Social Time

One of the most forceful elaborations of the concept of social time is found in Norbert Elias's *Time: An Essay* (1992). The insights found in this essay will take the argument several steps further and establish more solidly some of its theoretical bases. First, I reconstruct Elias's conception of time, as is found in this famous essay. Second, I draw out from it, as well as from other contributions such as Adam's (1998, 2004), some conceptual tools and insights needed in order to move the discussion closer to a concept of 'social time relations', which will act as a guiding thread for the remainder of the book.

Elias and the Question of Dualisms

Elias's rejection of dualistic thinking about time is of particular importance. While theories of time are often said to evolve in their own dualistic structure – e.g. Ricoeur's diagnosis of an aporia of time between cosmological and experiential conceptions – Elias articulates this question from a slightly different angle by critically addressing the separation between nature and society on the one hand, and between the individual and the group on the other. Both of these separations he finds related to the academicisation of disciplines in the practices of knowledge production in modern societies. He proposes to go beyond these separations in his study of time: 'The isolated individual no longer stands at the center. Nature is no longer a world of objects existing outside the individual; society no longer only a circle of others among whom the individual finds itself as if by chance'.[45] This line of thought is worth pursuing, especially with regards to the nature-society dualism and issues of social time.

Elias discusses some of the reasons why the nature-society dualism has been integrated into our modes of thinking and discursive paradigms. He articulates the problem around two elements that particularly stand out: one is the nature

44 Fraser 1999, pp. 21–43.

45 Elias 1992, p. 28.

of actual social development; the other is the differentiation in the sphere of knowledge between natural and social sciences:

> The steady expansion of human societies within the non-human, the 'earthly' sector of the universe . . . has led to a mode of discourse which gives the impression that society and nature exist in separate compartments. The divergent development of natural and of social sciences has reinforced this impression.[46]

The divergent development of science, the second factor identified by Elias, has also produced numerous conceptual dichotomies which have reinforced how nature and society seem to be isolated, independent, even antagonistic and incompatible with each other. This is a problem that Lukács, reading Marx, had addressed from the angle of the fragmentation of the social whole, the capitalist division of labour, the fragmentation of processes of production, and the specialisation of 'skills'. The academic disciplines that develop in the capitalist world tend to reproduce this fragmentation: they identify their 'objects', and tend to eliminate everything surrounding them in order to grasp their so-identified object free from 'interference'. A Lukácsian perspective therefore sees the specialisation of academic disciplines as an expression of the fragmentation of social life under capitalism. As Marx had argued, it is not 'the text-books that impress this separation upon life . . . [but] life upon the textbooks'.[47]

While for Marx and Lukács, it is the fragmentation of social life which is expressed in the separation of academic disciplines, Elias reverses the assumption, as for him 'we have got into the habit of conceptually splitting the world largely in accordance with the divisions between different academic specialisms'.[48] Those conceptual divisions in fact reflect, for Elias, 'different values attached by different groups to different, though related, levels of the universe'.[49] It is what could be described as power-knowledge struggles between groups engaged in natural sciences and groups engaged in social sciences that have contributed to the division of the world into separate objects of enquiry. The object of natural sciences has become a 'real', independent object: modes of scientific discourses in the natural sciences have isolated 'nature' as an 'object', existing on its own, separated from 'subjects', humans living in society. This divide now appears to be a feature of the world itself. Moreover, the dichotomy

46 Elias 1992, p. 44.

47 Quoted in Lukács 1971, p. 104; on this topic, see also Clarke 1982.

48 Elias 1992, p. 86.

49 Ibid.

between nature and society has been reinforced, at the level of scientific development, by the success of natural sciences in the exploration of their objects, a success that has conferred on them the status of a model or a standard for all other sciences, social sciences included.

Whether one shares the perspective of Marx and Lukács on that issue, or that of Elias, the fact remains that nowadays 'time' is a concept that seems to have been grounded firmly in natural sciences.[50] As such, as Elias argues, to examine it in terms of human societies or experience, or, in other words, in terms that are not reducible to mechanical laws of causation, appears to immediately condemn the project to the limbo of metaphysical, or even irrational, endeavours. For Elias, this explains why sociology has not focused on the examination of time in terms of mechanical laws of causation.[51] Opinion, as well as struggles and rivalries between academic branches, has made it so that 'time' is a concept which seems to belong to theoretical physics. According to common opinion, a theory of time is something found, for example, in Einstein's work; sociologists might therefore feel that this concept is out of their heuristic reach. For Elias, we have thus ended up with two concepts of time which have followed the lines of the nature-society divide: time has become separated between physical time and social time, and their fundamental relationship is obscured. On the one hand, we have 'physical time', which is a concept at a very high level of abstraction, and on the other hand we have 'social time', which refers to socially produced time-regulatory devices.

The problem with this dichotomy in the study of time is that the resulting two conceptions – physical time and social time – are treated as different concepts and explored independently from one another, and more often than not natural time is placed on a pedestal at the expense of social time. Meanwhile, 'the problem of time, however', says Elias, 'is one which we cannot hope to solve so long as physical and social time are examined independently of each other'.[52] Symptoms of the pervasiveness of such a dualism are found in many studies of social time, amongst them a classic contribution to social time studies: Jeremy Rifkin's *Time Wars*. While Rifkin crucially recognises the power relations which underpin every society's conception and organisation

50 An exhaustive treatment of the concepts and practices of time of contemporary theoretical physics are outside the disciplinary scope of this book in particular. However, I do not think they are outside of the heuristic reach being deployed here, as is shown in the discussion of Newton's conception of time. This topic is discussed more thoroughly in a forthcoming article.

51 Although we have seen that social sciences actually produced a rich and varied literature on the topic of time.

52 Elias 1992, p. 44.

of time leading up to 'battle over time values',[53] he nonetheless reproduces a dualism between 'social time' and 'natural time' as 'two *distinct* and *irreconcilable* temporal worlds'.[54] While for the American essayist, these two distinct worlds remained attuned for most of human history, modernity and its frantic pace has broken this harmony between the two temporalities, triggering an unprecedented 'temporal crisis'.[55] The dualism thus structures the book's argument from start to finish, preventing Rifkin's otherwise insightful essay from grasping the fundamental temporal interpenetration between nature, society and individuals.

Elias's diagnosis of dualisms provides a good opportunity to clarify some issues with regard to the relationship between nature and society. David McNally's critical re-dialecticisation of the nature-society dualism in his move toward a historical-materialist theory of language gestures to an understanding of the relationship between nature and culture, and natural and cultural – social – temporalities, which goes beyond this dualism. He points out how this dualism is translated into various other dualistic conceptual pairs, such as body-consciousness, thing-meaning, and so on. The crucial point here, for McNally, is to come to an understanding of how the two poles, nature and society, are simultaneously present and in tension in phenomena. For example, human bodies are simultaneously the result of natural evolution *and* sociohistorical conditions, '*homo sapiens sapiens* is simultaneously human (historical) and natural'.[56] Such an understanding leads to the consideration that 'society is naturally conditioned and nature socially mediated'.[57] In terms of time and temporality, McNally suggests that natural history forms one realm of temporality, and that while human history is continuous with it, it also involves a crucial discontinuity:

> [T]he emergence of cultural, language-using, toolmaking primates introduced a new order of temporality, the time of human history. This temporality does not transcend natural time, it mediates and supplements it, introducing different orders of determination.[58]

53 Rifkin 1987, p. 13.

54 Rifkin 1987, p. 54, my emphasis.

55 Rifkin 1987, p. 58.

56 McNally 2001, p. 159.

57 McNally 2001, p. 121.

58 McNally 2001, p. 8. For a discussion of the relation between natural and historical time from a slightly different angle, which addresses some of Marx's theses on the matter, see Fischbach 2011, pp. 95–8.

As such, different orders of determinations do exist between nature and society in terms of time and temporality, but the *a priori* separation of these two orders, instead of the acknowledgement of their continuities and discontinuities, might have disabling effects for theoretical endeavours into the question of time, such as rendering the theory incapable of grasping the relationship between intersecting temporalities that bring together bodies and their environments, social processes and biological human needs, human activities and climate, and so on.

This discussion illustrates how the problem of time cannot be studied inside a nature-society dualism. Studying time must take into account how nature and society are *temporally connected* to each other. As Elias explains,

> it might be enough to think . . . of the priest who tried to discover for his people the 'right time' for sowing, by observing the passage of the moon through a particular spot on the horizon. Here were people, as they are everywhere, dependent on the fruits of 'nature' for their food. They were dependent on the rain which made the seeds grow; they observed the movement of the moon – a physical movement – in order to find out when it was good for them to sow – a social activity; and they started observing the moon – a social activity – in order to find the best way of satisfying their hunger – a natural impulse.[59]

Recognising the socially mediated character of 'nature' and the embedded impacts of 'natural' processes on society might help bring about more comprehensive understandings of the question of time and temporality.

Accordingly, in what follows, I prefer to speak of 'socially mediated natural processes', or 'socially mediated natural time', instead of 'natural time'. Time being both natural and social means that 'social time' cannot be thought of without reference to the conditioning determinations brought about by natural phenomena, just as the latter cannot be properly conceptualised and addressed without a recognition of their always already socially mediated character. Natural phenomena such as celestial movements and atomic pulses are socially standardised continua of change, just as biological, natural and physical sequences of change, cycles, (in)stability, and (dis)continuity are ingrained in every form of social time relations (more on that below).

In terms of time and temporal practices, what is meant by 'socially mediated' is quite straightforward. Humans socially mediate natural processes and cycles of change in the sense that they alter, funnel, use, coordinate, divert,

59 Elias 1982, p. 89.

channel, exploit or conserve them, in order to survive and reproduce. 'Natural' temporalities are thus mediated by social ones. For example, the human use of fire is a way of socially mediating natural cycles of light and dark, of heat and cold, by temporally prolonging heat and light. Moreover, humans construct varying meanings around certain 'natural' temporalities, or, as Adam puts it, humans 'impose a cultural will on time'.[60] These social mediations and the meanings related to temporal experiences participate in the constitution of social time relations that embody both natural and social elements.

Elias therefore raises the problem of studying time inside a nature-society dualism, which can be solved by re-dialecticising those two poles and acknowledging their co-presence in time relations. The same applies to other dualisms such as the one between abstract and concrete time, which we will encounter later on in the analysis of capitalist time. Time actually displays dualistic characteristics in capitalism, but to arrive at this conception of dual but co-present times under the law of value, one needs to re-dialecticise standard dualistic frameworks such as 'nature vs. society' or 'individual vs. group', so that the abstract-concrete conceptual pair is itself always already recognised as mutually inclusive and internally related.

Time and Timing

This relationship between natural and social time is further addressed by Elias through his distinction between 'time' and 'timing'. 'Time', considered as a natural phenomenon, cannot be studied apart from 'timing', a social activity. Since timing almost always involves 'tying up' natural sequences with social ones, this dichotomy between social and physical time has to be rejected, 'if one explores time, one explores people within nature, not people and nature set apart'.[61] Accordingly, Elias takes his argument on the nature-society divide one step further by arguing that the conception of 'time' *qua* natural phenomena has its origins in human social activities of 'timing', and not the other way around. These origins, according to him, have been obscured. Consequently, the examination of the concept of time should be based on a historical analysis of social activities of timing.

Following this line of thought, Elias argues that 'time' is not a universal category, nor an ontological being. The key to this argument lies in the empirical observation that the human experience of time has changed, and continues to do so. Differences between societies, with respect to the social organisation

60 Adam 2004, p. 95.

61 Elias 1992, p. 97.

and experience of time, are historically very sharp.[62] For example, Elias points to the differences in kind between social time in contemporary societies and time-codes that prevailed in 'simpler' societies:

> The social code in the simpler societies contains few time-signals, and those few are all related to specific occasions; none of them approaches the ubiquity and the high-level synthesis characteristic of the time-signals of members of industrial nation-states.[63]

Timing practices, according to Elias, respond to timing problems that occur in the development of societies. ' "Time", or more correctly "timing", proves to be a means of orientation elaborated by human beings in the course of centuries in order to perform precisely specifiable social tasks, including the measurement of movements of heavenly bodies'.[64] Social activities and organisation pose timing problems, which require the members of social groups to perform 'an active synchronization of their own communal activities with other changes in the universe'.[65] One great leap in the development of social time and timing practices, notes Elias, is when people start actively producing their food, since agricultural practices bring problems of active timing to the fore. The domestication of plants, agrarian cycles, labour on the land, and caring for animals, for example, create practical social needs, which require specific timing practices, and consequently shape time-experience.

In ancient societies, there is an intimate relationship between priests, the production of an agricultural surplus, and time-telling. Religious figures were often the time-tellers in their social contexts, who would 'read' temporal signs, whether in celestial objects or terrestrial occurrences, in order to determine the right time to plant, to hunt, to attack a rival group, and so on. In this sense, the social power of religious elites and their oracles was intimately related to timing practices, and their power and prestige was founded in part on their ability to tell time. When larger and more complex societies and states developed, state authorities began to perform timing functions. The state increasingly absorbed the function of determining when certain social activities would be undertaken. The setting of time became a political monopoly. Accordingly,

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62 The literature is broad and rich. Among many others, see the Aveni 2002 on Native American time systems; Needham 1981 on China; and Hannah 2009 on social times in Antiquity.

63 Elias 1992, p. 160.

64 Elias 1992, p. 82.

65 Elias 1992, p. 49.

> The social need for an orderly and unified time-reckoning varied in accordance with the growth and decline of state-units, with the size and the degree of integration of their peoples and territories and the corresponding degree of differentiation and length of their commercial and industrial ties.[66]

Notwithstanding the historical nuances one might bring to Elias's analysis, he is suggesting here that the more complex societies have become, the more 'urgently' timing problems have been posed.[67] The responses to these practical social problems have often taken the form of social institutions of time regulation, such as calendars, which reflect how societies have regulated their social time practices according to chosen 'natural' standards:

> The Gregorian reform of Julius Caesar's reform of the old Roman calendar was the last attempt, so far, to provide a calendar system for a social year which, over the centuries, did not diverge too much from the 'natural year', that is, from the time in which the sun – in relation to men as observers and centers of reference – returns to a point in the sky which has been singled out by them as a point of departure.[68]

While today people largely experience 'time' as an even, uniform and continuous flow, this has not always been the case. For example, the conception of natural time as a continuous flow is itself a product of developments in social time-scales:

> Ptolemy used [the] Babylonian era time-scale, the oldest and longest available to him within his knowledge continuum, for the construction of his model of the physical universe . . . Today, it is often taken for granted by philosophers and, perhaps, by physicists that time flows in one direction, and the flow of time cannot be reversed, although Einstein's theory, while maintaining the serial order of time, questioned its unidirectional

66 Elias 1992, p. 54.

67 It might be problematic to maintain that timing problems are more 'urgent' in industrial societies than the need to temporally articulate agricultural practices such as planting and harvesting in agrarian societies. Perhaps Elias's use of the term 'urgent' should here be read more as a greater pervasiveness, frequency or generalisation of timing problems in more 'complex' societies.

68 Elias 1992, p. 55. On the numerous variations and problems of calendar time reckoning, see Hannah 2009.

> character. It is hard to imagine that physicists could have developed the concept of a unidirectional and irreversible flow of time within their sphere without the slow and difficult emergence of social time-scales, with the help of which one could accurately determine the non-recurrent, continuous sequence of years, centuries and millennia.[69]

The emergence of these social time-scales is linked with the establishment of 'time' as a measuring device for long non-recurrent time-sequences. This was possible

> only when social units such as states or churches had the character of long-lasting continuum of changes within which living groups – usually ruling groups – found it necessary for the functioning of their institutions to keep alive the memory of the continuity of these constitutions in a precise and articulate manner . . . The emergence of long-lasting and relatively stable state-units, in other words, was a condition of the experience of time as a unidirectional flow.[70]

It is by approaching the problem of time in this way, i.e. by looking at human *timing* activities, that Elias shows how it is social time that underpins the human 'discovery' of natural time, and not the other way around. The development of a highly abstract concept of physical time is tied up with the development of the social requirements of people. Social time encompasses the concept of physical time, and physical time has only branched off from social time quite recently in history. Elias pleads that the modern ascendance of a concept of 'natural' time over a social one should not obscure the fact that such a concept of 'natural time' is a product of the timing of nature through the use of human-made devices. He argues further that such practices emerged as late as with Galileo, who was the first to use timepieces in order to measure purely physical sequences:

> [N]ever before had human-made time-pieces been used in this manner as a measuring rod for physical processes. The clepsydra, an elaborate version of which he used in his experiments, was traditionally a time-piece employed for timing human affairs. It was a social time-meter. Timing had been human centered. Galileo's innovatory imagination led him to change the function of the ancient timing device by using it

69 Elias 1992, p. 57.

70 Ibid.

> systematically as a gauge not for the flux of social but of natural events. In that way a new concept of 'time', that of physical time, began to branch off from the older, relatively more unitary human-centred concept. It was the corollary of a corresponding change in people's concept of nature. Increasingly, 'nature' assumed in people's eyes the character of an autonomous, mechanical nexus of events which was purposeless, but well ordered: it obeyed 'laws'.[71]

This discussion illustrates the emergence of a concept of physical time from the broader matrix of social time (regardless of whether or not we agree with Elias's depiction of Galileo as the innovator in this regard).[72] The concept of time has thus come to be envisaged from a perspective in which it appeared as an unchanging variable of physical events, while in another sense 'time' had the appearance of a social institution, a regulator of events, a human experience. Those two times came to be regarded as possessing different values: natural time was 'real', whereas social time was a mere human convention.[73]

Such an examination of timing practices leads Elias to root his concept of time in timing activities. He conceptualises timing as the connection, by people, of two or more sequences of continuous changes. Such a connection is based in the human capacity for synthesis, of which one aspect, for example, is memory. One of the sequences serves as a standard to measure the others. In this sense, timing is an intellectual act of synthesis, of putting in relation two or more different sequences. These sequences can be very different from one another: the movement of heavenly bodies and the changing relations between people are in concrete terms very different, yet humans measure the latter with the help of the former. What these discrete sequences of change have in common that permits them to be put in relationship through the social activity of timing is that they change in a regular sequence order. The solar year can be used to measure the age of a rock, a state, or personal changes in an individual. For Elias, the concept of time refers ultimately to what these sequences share in common: they change in regular sequence order.[74]

This connecting activity at the very basis of the concept of time cannot be understood on a purely 'natural' level; Elias's definition of time implies

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71 Elias 1992, p. 115.

72 One could, for instance, make a similar argument to that of Elias, but go back as far as the Greek Antikythera mechanism (see Hannah 2009).

73 Elias 1992, p. 116–17.

74 This is one way in which Elias's concept of time is problematic: it renders it difficult to make sense of temporal discontinuity, rupture, non-linearity and irregularity.

fundamental participants: humans in society. Indeed, for time to be perceived in the first place requires 'focusing-units', human beings, endowed with a specific capacity for synthesis. The perception of event A, B, and C as happening 'in time', as a sequence, requires beings endowed with this potential for synthesis, which for Elias is activated and patterned by experience. This potential for synthesis is characteristic of humans and of their capacity for orientation. 'Time', in this sense, is the product of 'timing' activities performed by humans, it is a way, a means, of orientation, 'that which one today conceptualizes and experiences as "time" is just that: a means of orientation'.[75] What humans possess intrinsically (and socially) is not an *a priori* sense of time, but rather a capacity for synthesis. It is from this capacity for (symbolic) synthesis that the concept of time has evolved through the timing practices of social groups.

The word time, then, for Elias, is

> a symbol of a relationship that a human group, that is, a group of beings biologically endowed with the capacity for memory and synthesis, establishes between the two or more continua of changes, one of which is used by it as a frame of reference or standard of measurement for the other (or others).[76]

What we call time is

> a frame of reference used by people of a particular group, and finally by humankind, to set up milestones recognized by the group within a continuous sequence of changes, or to compare one phase in such a sequence with phases in another, and in a variety of other ways.[77]

Elias's work thus leads to the consideration of time as a complex network of relationships emanating from the practices of timing as a synthesis, an integrating activity, an act of synchronisation between discrete and different sequences of change, which need not be only conceived of as 'intellectual', as Elias has it, but also as encompassing bodily processes along with social practices and behaviours. In such a timing activity, sequences at all levels of the universe, physical, biological, social, personal, can be put in relationship: 'At the present stage of development, time, as we can see, has become a symbol

75 Elias 1992, p. 38.
76 Elias 1992, p. 46.
77 Elias 1992, p. 72.

of a very wide network of relationships, in which sequences on the individual, social and non-human natural planes are interconnected'.[78]

For Elias, it is only at the human level that natural processes, such as the solar year, can be symbolised at such a high level of synthesis. A symbolic synthesis such as time entails a long process of learning, which has been handed down from one generation to the next. Indeed, as Rifkin puts it, 'Every culture inculcates its newest members by way of an elaborate and often complex process of temporal entrainment'.[79] Accordingly, every individual belonging to a given society must learn, as a child, the prevailing concepts and practices of time. As a means of orientation in the social group, children must internalise this 'time' in order to become functioning individuals in that society. In modern societies, for instance, the school system is the central institution through which clock-time is taught and learned.[80] The mere fact that children need between seven and nine years to 'learn time', that is, to read and understand accurately the symbolism of watches and calendars and to adjust their behaviour accordingly, points to the fact that time is not merely 'innate' and 'natural', but rather is socially produced and embedded:

> [S]elf-regulation in terms of 'time' which one encounters almost everywhere in later-stage societies is neither a biological datum, part of human nature, nor a metaphysical datum, part of an imaginary a priori, but a social datum, an aspect of the developing social habitus of humans which forms part of every individual person.[81]

This points to how, in such processes of 'acquiring time', the social regulation of time specific to a form of social time relations is individualised by society's members and comes to shape their personal time-consciousness. Such regulation and normalisation is modelled along the prevailing *social time regime*, understood here as the politico-institutional forms taken by social time relations.

What Elias gestures to, namely, that time is the synthesis of a cluster of different temporal relations, leads the enquiry towards what Adam will call, as discussed below, a 'timescape'. But before moving on to Adam's concept, there remain elements of Elias's work that still need to be addressed, particularly with regards to calendars and clocks, and the fetishism and reification of time.

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78 Elias 1992, p. 15.

79 Rifkin 1987, p. 56.

80 Adam 1995, pp. 59ff.

81 Elias 1992, p. 149.

Timing Synthesis: Clocks and Calendars

Elias further develops his argument pertaining to the inseparability of nature and society in the study of time through his discussion of calendar time.[82] In his view, 'Calendar time illustrates in a simple way how the individual is embedded in a world in which there are many other people, a social world, and many other natural processes, a natural universe'.[83] With calendar time, the age of an individual, the age of a society and the age of the universe, are all defined in relation to the solar year, an event-sequence that has acquired the status of a measuring standard.[84] Elias's insights on calendar time shed light on further ways in which society mediates 'natural time'. Indeed, as seen in the introduction, the fact that the solar year is used as a time-unit does not mean that a year is a purely natural temporal phenomenon: rather it means that the solar year has acquired the status of a standard of measure of time in society. There is always a substratum of social determination and convention underneath the apparent naturalness of time-units.

Calendar time has taken many forms, and its 'official' Western variant has been subject to numerous reforms and changes throughout history – more on this later. As mentioned earlier, this historical malleability of time-systems in general, and of calendars in particular, stems not from human inability to measure natural time accurately, but rather from the fact that nature is not ordered in a way that is directly amenable to the temporal organisation of human social needs. A common, purely practical view would hold that calendars are good or bad according to their approximation of the 'real' solar year. According to the present discussion, however, the point could be made for evaluating whether or not calendars are 'good' based on their capacity to meet social and political needs embedded in social time relations.

Furthermore, in the course of the development of timing practices, humans have found that they could have more precise sequences than natural phenomena such as tides or solar revolutions, in order to meet social requirements of activity orientation. We saw how today this need for precision has led from tuning our clocks to the skies, to tuning them to the oscillations of atoms. But for Elias, the clock, to start with, is a human-made device the purpose of which

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82 The term calendar goes back to the Latin word *calendare*, which means 'to call out', 'to announce', and is reminiscent of priestly functions to announce the time in certain ancient societies. This might be derived from the Greek 'kalo', which means 'I call' (Elias 1992, p. 193; see also Hannah 2009, p. 23).

83 Elias 1992, p. 28.

84 Calendars are not necessarily 'solar'. Lunar and lunisolar calendars, for example, have also been used by numerous societies.

is to produce more precise sequences: clocks 'are nothing other than human-made physical continua of change which, in certain societies, are standardized as a framework of reference and a measure for other social or physical continua of changes'.[85] 'Seconds' and 'hours' are socially standardised abstract time-units that are used to measure physical or other sequences. In the study of calendars and clocks, one finds once more that the 'physical' concept of time branches off from social timing practices: 'Clocks (and time-meters generally), human made or not, are simply mechanical movements of a specific type, employed by people for their own ends'.[86] Their function of measurement comes from the fact that their sequential movement is characterised by equidistant intervals between each point of their sequences, and it is this characteristic, at the basis of time-units such as a 'second', an 'hour', and so on, that allows them to serve as comparison sequences for other sequences' successive happenings in terms of their duration. The branching off of a physical concept of time is a corollary of when people started to produce and use devices such as these.[87]

Are calendars and clocks, then, to be distinguished in the way suggested by Walter Benjamin? For him, although calendars and clocks are both forms taken by the social reckoning of time, the calendar has a fundamental qualitative relationship to historical consciousness while clocks do not. Pointing to the French Revolutionaries' design and implementation of a radically new calendar as the emergence in history of a new form of consciousness, Benjamin depicts calendars as 'monuments of a historical consciousness'.[88] Accordingly for Benjamin, calendars and clocks do not belong in the same category.

However, calendar time and clock-time are not necessarily separated institutions. Calendars and clocks are historical products of social time as a 'struggling entity': both clock-time and calendar time take on specific forms in different social time relations, and they express and represent time and history constituted through social struggles. Their evolution is marked by processes of socio-temporal struggles within – and between – societies. For example, as I will discuss later, the Gregorian calendar and clock-time come together in capitalist social time relations and coalesce into a specific hegemonic time-form. Historical consciousness might not be an aspect of temporality expressed exclusively in calendars, since it is possible – in capitalist social time relations –

85 Elias 1992, p. 46. Much more will be said on calendars and clocks in what follows. For now let us focus on Elias's point.

86 Elias 1992, p. 118.

87 Elias 1992, pp. 118–19.

88 Benjamin 2000, p. 440.

for both clocks and calendars to come together in the expression of specific forms of historical consciousness. As such, clocks can participate in the formation of historical consciousness.

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This discussion, triggered by Elias's point on socially standardised sequences of change, also further clarifies the issue of 'time-units' touched upon in the introduction. How different societies compare and standardise different sequences of change and ascribe them temporal meanings is indicative of how time-units are socially constructed units, which come to find bases of measurement in 'nature' only, it would seem, *a posteriori*. While some units employed in time-reckoning and measurement seem to be quite directly 'natural' phenomena (a day is based on the Earth's rotation around its axis, while a year refers to the Earth's revolution around the sun), neither days nor years are expressions of a direct and unmediated relationship between humans and nature. They are rather products of social standardisation. For example, as mentioned earlier, if a day is defined by the rotation of planet Earth, there arises a problem of definition that can only be resolved through social convention. Indeed, a 'solar day' would be the time taken by the Earth to accomplish a full rotation relative to the sun. A sidereal day, then, would be the time taken by the Earth to accomplish a full rotation relative to the distant stars. As a matter of fact, these two are not equal: for Earth, the sidereal day is shorter (by about 3min 56sec) than the solar day. In fact, the Earth spins 366 times about its axis during a 365-day year. Moreover, as mentioned, there are irregularities in the steadiness of the Earth's motion, and the speed of the Earth's rotational spin is actually progressively slowing down, which accounts for the adding of a 'leap second' to Universal Coordinated Time about every year and a half to compensate for this 'loss of time'. Since 1972, twenty-four such leap seconds have been added. In the contemporary time system, what is defined as a 'civil day' is basically an average of meridian day and solar day. The definition of a year can be deconstructed in the same way, since it can be related to many different processes. Which one of the star year, solar year, lunar year, tropical year, or any averaging of these, is adopted in a time-system, rests ultimately on social convention.[89] In this sense, the day and the year are not simply natural phenomena. They have to go through a process of definition and validation, which is social. They are the products of operations of standardisation that involve a crucial level of social mediation between humans and nature.

89 See also Hannah 2009.

Recall the example of the time-unit 'second', mentioned in the introduction. While the 'second' started out as a fraction of other time-units (1/60th of a minute, 1/3600th of an hour, etc.), it has now become the standard upon which other time-units are based. It is quite telling that the standard unit of time has historically moved from 'longer' to 'shorter' units. Whereas the day and the hour have occupied this role in different social forms, the second is now, in modern societies, the time-unit of reference. On the one hand, one might point to the 'acceleration of social processes'[90] in order to make sense of this development, although, on the other hand, some accounts invoke specialisation processes occurring in various 'communities of practices', astronomers, physicists or seafarers, for example, in need of more precise time-units in their practical activities.[91] Ultimately, as will be discussed below, such a refinement in precision can also be related to processes of capitalist development. In any case, whether one grounds the social need for more 'precision' in time measurement in the 'acceleration of social processes', in the needs of 'communities of practices', or in processes of capitalist development, the point to keep in mind here is that the growing 'precision' requirements of social time thus mediate how and why humans relate to 'natural' cycles, which cycles become socially relevant, and as such which 'natural' basis is used to anchor 'social' cycles with 'natural' phenomena. As the forms of organisation and reckoning of time vary from one society to the other, so does the 'natural basis' upon which social validation rests.

Fetishism and Reification

One last point to sketch out from Elias's contribution is his raising of the problem of the fetishism and the reification of time. Indeed, he observes that time is a reified concept. First, he argues that the reification of time finds its source in its very characteristics as a concept. Since the concept of time represents an intellectual synthesis, a connection of events, of sequences of change, at a high level of abstraction, one tends to 'attribute to "time" itself the properties of the processes whose changing aspects this concept symbolically represents'.[92] In other words, the very fact that time emerges from what is common to different sequences might be responsible for it appearing 'independent':

> The common feature of this multiplicity of specific sequences of events that people seek to measure by means of clocks, or calendars, is called

90 Hassan 2009.

91 Glennie and Thrift 2009.

92 Elias 1992, p. 121.

> time. But because the concept of time can refer to when-aspects of very different sequences, it is apt to appear to people as if 'time' is something existing independently of any social standardization of relational sequences and of any relation to specific sequences of events.[93]

Elias refers to this as the 'fetish' character of time. He points out that it is even more pronounced in developed and complex societies: 'this fetish character of what we call "time" is particularly reinforced in people's perception because the social standardization of individuals in terms of socially institutionalized time is anchored more firmly and deeply in their consciences the more complex and differentiated societies become'.[94]

The second component of Elias's analysis of the reification of time is found in his contention that Western linguistic traditions have reified 'time' as an object; by making it a substantive rather than verbal form, 'it has transformed an activity into a kind of object'.[95] He adds: 'The verbal form "to time" makes it more immediately understandable that the reifying character of the substantival form, "time", disguises the instrumental character of the activity of timing'.[96] The linguistic habits described here reinforce the myth of time as something that exists independently, that can be measured, even though it cannot be perceived by the senses as an object: 'As is often the case in our type of socio-symbolic universe, highly abstract symbols become reified in common parlance and assume a life of their own. Time-concepts in general . . . are particularly prone to this hypostatic use'.[97]

Moreover, as discussed above, with the production of clocks, ironically, time appears to run its course independently of any human beholder, 'seconds', 'hours', and so on now appear as symbols of instances in the flux of incorporeal time, obscuring the fact that both time-units and clocks are human-made symbols and devices. The symbol of time has been cut off from observable data. It assumes a (reified) life of its own, in part since timing devices appear as self-moving, and in part because ' "time", in common with a whole set of other social institutions, is relatively independent of any particular human being, though not of human beings in their capacities as societies or humankind'.[98] In our day and age, continues Elias, time is the symbol of an inescapable and

93 Elias 1992, p. 104.
94 Ibid.
95 Elias 1992, p. 43.
96 Ibid.
97 Elias 1992, p. 69.
98 Elias 1992, p. 121.

all-embracing compulsion. The reification of time is more acute in large and complex societies because requirements of coordination and synchronisation are more important. In modern industrial societies, the sense of time is so deeply rooted in people that they find it hard to see it as a result of social experiences. The individual has to attune his or her own conduct to the established 'time', making it an objective fact of life.

For Elias, the acute sense of time found in modern societies is reflected in enquiries about time by philosophers and physicists. Theorists either posit time as an object in the world, or as a property of subjects. Physicists accept at face value the concept of time that they have inherited from a long chain of social developmental processes as if it were the only concept of time, but they ask neither why the concept of time possesses its present form, nor why it has attained such ascendancy. The enquiry of time would fare better if it asked why time has become such an object in the first place. Philosophers, for their part, have made time a feature of human consciousness, of the human power to reason. They have not examined how time is learned, and how it is socially constructed. For Elias, thinkers in both groups have tended to look for an immutable order beyond all change, for something, 'time', which was a universal, stationary, eternal feature of consciousness, or object of nature.[99] The net result is that thinkers tend to treat time as a universal concept, and fail to see that the human activity of timing has had several different forms.[100] Thinkers have thus forgotten the past:

> Members of societies who as *beati possedentes*, benefit from a rich knowledge heritage including many conceptual representatives of a high-level synthesis, have for many centuries tried in vain to solve what was for them the enigma of that possession. Already in antiquity men like Augustine wondered about time. Kant more than a thousand years later found many admirers for the hypothesis that time and space were representatives of an intellectual synthesis a priori which meant, in dry words, that this form of synthesis was part of human nature or inborn. It was, as one may see, a classical case of forgetting the past, of disregarding the

99 For Elias, even though Einstein rightly pointed to the fact that time was a relationship and not, as Newton had argued, an objective flow, he did not go far enough in this insight. He did not escape what Elias calls 'word-fetishism', and maintained a reified concept of time by arguing that under certain circumstances time could expand or contract. However, it might be pointed out that Einstein's ideas imply that time *as a dimension of space-time* can expand and contract, thus this property is not restricted to time as such.

100 Elias 1992, p. 127.

> whole knowledge process leading up to one's own stage, one's own level of synthesis.[101]

One might conclude, then, with Elias, and notwithstanding his sometimes caricatured depictions, that studies of time might gain from more historical analysis.

While Elias asks important questions and identifies key problems, the answers he gives are not entirely satisfactory. This is due in great part to the fact that although he identifies the ultimate locus of time in the social terrain of timing, he does not see the relation between time and the social organisation of material and human (re)productive activities in a clear-cut fashion. Taking property relations and the reproduction of social power into consideration further exacerbates Elias's problems, and provides different answers to the questions he insightfully raises. Indeed, the development of differentiated conceptions and practices of time can be related to social time relations, conceived of as a locus of struggle. As such, an analysis of time in contemporary societies gains from taking into consideration the development of capitalism as a contradictory social system. This perspective might shed new light on the issue of the reification of time, and open up more broadly the question of temporal alienation. What Elias presents as a result of linguistic habits and conceptual vicissitudes might be rooted in capitalist value formation. What follows thus expands on Elias's line of thought in order to shed a different light on some of his claims, and takes into account the consequences that the development of capitalism has had on the social history of time. As such, it retraces the history of both clock-time and capitalism, and assesses their relationship, before examining aspects of the core logic of capitalism with a special eye on the issue of time and temporality. This leads to the development of a multi-layered account of capitalist social time relations. Building on Elias's crucial insights and pushing them forward, social time appears as a 'struggling entity' in which different orders of time and temporality come together and are shaped by social relations of property and power.

Barbara Adam and the Concept of 'Timescape'

Barbara Adam's work on social time has rapidly become a standard in time studies, both for its originality and its scope. Of particular importance is her focus on the multiplicity of time and her concept of 'timescape', but her work also provides a profound existential reflection on the temporal character of social and cultural development. For Adam, cultural development is tied to

101 Elias 1992, p. 176.

a fundamental temporal relationship between humans and the world: the awareness of the finitude of human existence. Human culture is thus in itself an expression of this primary temporal relationship. In her own words,

> I therefore want to argue that the development of human culture, that is, the form of life and practices embodied in traditions, institutions and artefacts, is inextricably tied to the relationship to time. It is bound to approaches to finitude, transience and decay, and to the human quest for transcendence of the earthly condition.[102]

The question of culture, tied to the desire to transcend the earthly condition of finitude of human existence, is therefore inseparable from the question of time. Note here how society and nature – or 'earthly conditions' of birth, life, death and decay – are not dichotomised, but instead are understood as both taking part in the reality of social time.

Building on these themes, Adam proposes the concept of 'timescape', which aims at grasping the multiplicity of temporalities in which humans dwell within the social field. Social time, for Adam, is not to be understood in narrow terms: although her work seems to position subjective experiences of time at centre stage, her concept of timescape does grasp how the temporalities of the social field are made up of different biological, psychological, natural and social temporalities complexly threaded together in our experience. Robert Hassan efficiently summarises Adam's conception:

> Adam's idea of timescapes may be seen as the intricate intersecting of the rhythms, beats, sequences, beginnings and ends, growth and decay, birth and death, night and day, seasonality, memory and so on that constitute the diversity of embedded temporalities that are part of everything: from the eons it takes for a rock to turn to sand, the birth and death of a civilisation, the life span of the fruit fly, to the lifetimes or minutes that permeates a memory or dream.[103]

The concept of timescape is a crucial tool, for it refines the understanding of the different components of social time. For Adam, a timescape comprises the following: (a) Time frames – which I also call time-units – which are measures for duration such as seconds, days, years, lifetimes, eras and epochs; (b) Temporalities, which refer to change and movement, and which denote process and impermanence; (c) Tempos, which refer to the pace, the intensity,

102 Adam 2004, p. 72.

103 Hassan 2009, p. 46.

or the rate of an activity, process or practice; (d) Timing, which Elias understood broadly as the very basis of time, is for Adam understood more narrowly as the activity of synchronisation; (e) Time points, which refer to a moment, a 'now', an instant or a juncture; (f) Time patterns, which highlight the rhythmicity, periodicity or cyclicality of a practice or process; (g) Time sequences, which refer to series, to cause and effect relationships, or to simultaneities; (h) Time extensions, which refer to duration itself, the continuity of a practice or process; and finally (i) the triad of past, present and future, which points to temporal horizons, memory, perceptions and anticipations.[104] When suitable and conducive to a better understanding of conceptual nuances, I will make use of these conceptual definitions.

Alongside conceptual rigour, the concept of timescape also provides a space for understanding the threading of different time forms in coexistence as a process of hierarchisation. This hierarchising of time relations expresses and reproduces social relations of property and power. As Adam herself puts it, 'I propose that we think about temporal relations with reference to a cluster of temporal features, each implicated in all the others *but not necessarily of equal importance in each instance*. We might call this cluster a timescape'.[105] Adam puts more emphasis on the *multiplicity* of times comprised in any timescape than on the *logic of power* which their ordering displays. In other words, although she recognises the differentiated importance of different times within a given timescape, the logic of power and struggle involved in any timescape sometimes gets overshadowed in her analysis by the focus on 'multiplicity'. Robert Hassan has taken up this aspect of the timescape as a 'hierarchy of temporal rhythms', made up of 'dominant timescapes and subsidiary temporalities'.[106] Such a stance has enabled him to posit the historical development and impositions of two successive 'empires of speed', the first predicated on clock-time, and the second on what he has termed 'network time'. Building on this line of thought, I use the concept of *social time relations* to highlight the logic of power entailed in any 'timescape', and to stress their proximity with social-property relations[107] and social relations of power. While Adam works her concept of timescape as a layout of multiple social times,

104 Adam 2004, p. 144.

105 Adam 2004, p. 143, my emphasis.

106 Hassan 2009, p. 49.

107 The term 'social-property relations' is borrowed from the historical and theoretical work of Robert Brenner and Ellen Meiksins Wood and the 'Political Marxist' framework of socio-historical analysis (see Dufour and Rioux 2008 for a summary of the approach. See also works that build on various aspects of this approach, most notably by Post 2012, Kennedy 2008, Knafo 2013, Lacher 2006, among others.).

I refer to social time relations more straightforwardly as 'struggling entities' in which different and often contradictory times are organised according to a logic of power, and take contested politico-institutional forms in social time regimes.

What follows aims at conceptualising the historical and theoretical relationship between capitalism and clock-time. I argue that social time relations in capitalist societies are dominated by clock-time: capitalist clock-time occupies a *hegemonic* position in the hierarchy of temporalities that form capitalist social time relations, alienating, subordinating, colonising, absorbing and/or marginalising other conceptions and practices of time and concrete temporalities. Moreover, this study operates with an explanatory rather than a descriptive logic. I argue that capitalist social time relations are dominated by abstract clock-time *because* of the intimate relationship between clock-time and processes of capitalist value formation.

So while many great social scientists, and particularly Elias, have shown how time can be studied as a social phenomenon, Adam for her part has contributed to time studies in a fundamental way with her concept of timescape. Following Hassan's intervention, I emphasise that while time is multiple, it is also a locus of struggle and displays logics of power. Indeed, social time is embedded in social relations of power and property. What I call social time relations are thus socio-historically specific conceptions and practices of social time comprising multiple and hierarchised times and temporalities. These relations are in tension and sometimes in conflict, and they are organised or institutionalised to varying degrees.

CHAPTER 2

The Origin of Clock-time, and the Origin of Capitalism

The contested imposition of conceptions and practices of time by religious authorities, ruling groups, state officials, scientific elites, or more broadly by dominant classes, figures prominently in the literature on social time, although it is often described in less conflictual terms, as 'rationalisation' of time, or 'organisation' of time.[1] One of the most widely spread of such time-forms, the calendar, dates back to ancient societies; however, the main focus here is on a relatively new phenomenon, the mechanical clock and clock-time (originating in the thirteenth and fourteenth centuries).

The following pages retrace clock-time's historical journey from a time-form embedded in specific pre-capitalist social time relations, to its slow but unmistakable development into a social time infrastructure in a period of transition to market mediated social-property relations, up until just prior to the Industrial Revolution. The enquiry focuses on the historical origin of mechanical clocks and their relative spread, especially in urban settings. It then moves on to an account of the transition from feudalism to capitalism, and of a historical moment when clock-time's temporal infrastructure is slowly being built in some parts of Western Europe – the focus is on England – while agrarian capitalist social relations are developing in the English countryside. This context underpins Isaac Newton's formulation of a historical milestone in the history of ideas: his important and influential concept of 'absolute time', which is read in context. The main proposition here is that clock-time, although increasingly present in pre-capitalist social time relations and slowly deployed as a socio-temporal infrastructure in certain social microcosms, does not reach a hegemonic position in pre-capitalist European social time relations.

1 The Innovation of the Clock: Clock-time, Wage-labour and Commerce in Context

The innovation of the mechanical clock and its corresponding form of time, 'clock-time', is a momentous development in the history of social time. Many

1 See, for example, Zerubavel 1981, among others.

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treat the invention and spread of mechanical clocks in the late medieval period as a powerful modernising force, or even as the very 'symbol of the process of European modernization'.[2] Importantly, however, while clocks are a paramount symbol of modernity, their origins are distinctively pre-modern. Moreover, the advent of abstract clock-time was far from driven by purely technical 'discoveries', and did not represent a once-and-for-all shift from the concrete time-units, temporalities, timing practices, time patterns and time sequences of human practices to abstract ones, quantified and measured by abstract time-units. The 'revolution of the clock' of the fourteenth century was perhaps not as 'revolutionary' as it appears at first glance. It is only later, after the consolidation of capitalist social relations, that the process of universalisation of clock-time truly unfolds, that clock-time embarks on its path to social hegemony. The focus for now is on the first act of this historical process, the introduction and diffusion of clocks and clock-time in Late Medieval and Renaissance Europe.

1) On the face of it, the invention of the clock might seem like a development to be treated as part of the history of techniques and technology, which in turn would have had monumental effects on social development. In short, clocks are invented, and then societies change their relationship to time as a result of this. If one were to adopt such a perspective, 'modern' time would be viewed as a product of the invention of the clock, leading to the replacement of 'imprecise' medieval time-reckoning systems with progressively more 'precise' clock-time, a development fuelled by the further refinement of clock mechanisms. From such a perspective, the history of technique and technology underpins social history. The development of clocks would in itself be treated as the main causal factor explaining the advent of 'modern time', and thus a crucial explanatory variable in accounts of the advent of 'modernity' itself.

However, treating the invention of clocks as an endogenous technological development amounts to isolating the development of technology from its social context. Such treatment moves back to a mechanistic explanatory strategy for social development, and as such is subject to the pitfalls of *technological determinism*. Many writers have warned against this form of causal narrative.[3] In the case of mechanical clocks and clock-time, historian Jacques Le Goff pursues an insight developed by Marc Bloch, and reminds us that 'l'histoire des techniques est impuissante à expliquer à elle seule le passage du

2 Dohrn-van Rossum 1996, p. 3.

3 For a critique of technological determinism see E. Wood 1995, pp. 108–45.

temps médiéval au temps moderne'.[4] Dohrn-van Rossum, for his part, writes that 'the introduction of public clocks was not only a technological but also a social innovation'.[5] Similarly, in his study on time and labour, which I return to later, Moishe Postone remarks that

> the emergence of abstract time cannot be accounted for solely with reference to a technical development such as the invention of the mechanical clock. Rather, the appearance of the mechanical clock itself must be understood with reference to a sociocultural process that it, in turn, strongly reinforced.[6]

In this sense, along the lines of the distinction drawn by Dohrn-van Rossum,[7] I do not wish to address so much the question of the *invention* of the clock, but rather the question of the *innovation* of clocks and clock-time.[8] Moreover, I focus on the *social embedment* of this process of innovation.

A critique of technological determinism highlights the fact that technology does not develop on its own. Indeed, for one thing, the historical rhythm of technological innovation and development is not straightforward or linear. Its continuities and discontinuities, jumps and lags, movements forward and back, cannot be endogenously explained without recourse to social and historical factors: in other words, the history of technology cannot be properly told without resorting to social and historical explanatory variables in order to make sense of its progress and vicissitudes. Social and historical conditions fuel, prevent, accelerate or dispatch technological innovations, and are therefore fundamental variables to take into consideration in any study of technological innovation. More fundamentally, different settings of social-property relations can have differentiated effects on technological 'stagnation', 'development', or 'progress'. In short, socio-historical change does not occur simply as an effect of technological innovations. Rather, innovations respond to social interests and needs. Note, for example, the crucial role played by the social institution of war

4 Le Goff 1997, p. 67. 'The history of technique does not have the explanatory power, on its own, to account for the passage from medieval time to modern time' (free translation). Marc Bloch had called for further studies of the relationship between technical development and 'social needs' (discussed in Dohrn-van Rossum 1996, p. 12).

5 Dohrn-van Rossum 1996, p. 126.

6 Postone 1993, p. 203.

7 Dohrn-van Rossum 1996, p. 125.

8 'In contrast to invention, innovation describes, on the one hand the datable process of the introduction of something new at a certain place, and, on the other hand, the totality of such events and processes' (Dohrn-van Rossum 1996, p. 125).

in creating interests and needs that fuel the development of means of transportation throughout history. Accordingly, the innovation of clocks and clock-time is not a mere technological feat. It is a socio-historical phenomenon, and proper contextualisation is needed in order to clarify its historical meaning.

To assert that human inventiveness does not occur in a social void, however, does not take anything away from human creative abilities. There is no contradiction in emphasising the astonishing character of the technical improvements in the history of time-measurement and clock-making and the amount of human creative genius necessary to the movement of such a process on the one hand, and the social motives and interests, the socio-historical logic and context of such a development on the other. Although technological improvement and discoveries occur in socio-historically specific contexts shaped by social conflict, social-property relations and their corresponding sets of 'rules of reproduction',[9] one can appreciate and underline the creativity and genius deployed by human mental and manual skills in these processes.

2) The process of innovation and spread of clocks occurs in the context of pre-capitalist social-property relations and social time relations. Although one should not underestimate the impact of clock-time in pre-capitalist societies, a qualitative gap separates European pre-capitalist clock-time from capitalist clock-time. More precisely, there's a qualitative difference between clock-time's place in pre-capitalist social time relations, and its place in capitalist social time relations. This gap does not so much reside in a fundamental shift in techniques or philosophies of time, although they are parts of this process. It is only with the consolidation of industrial capitalism that abstract clock-time comes to occupy a hegemonic position in social time relations. Clock-time hegemony in capitalist societies is something different from its diffusion in some specialised fields or more or less isolated practices in pre-capitalist contexts, or from its relative homogenisation of local time-signalling in some Renaissance urban areas. As such, the qualitative gap has to do on the one hand with the level of penetration and colonisation of social life as a whole by clock-time, and on the other with the unification and universalisation of a clock-time framework across space. With respect to these two criteria, clock-time is very different before and after the advent of capitalism.

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9 Understood as a historically specific set of practices that allow agents to reproduce their social position and power in given social-property relations (see Brenner 1985a).

A historiographical controversy surrounds the invention of the mechanical clock.[10] Historians do not agree on exactly when and where the first mechanical clocks were made, and this has to do mainly with the absence of this information from historical data. However, a broad consensus exists as to the mechanical clock's European origins, and while there is no clear-cut answer to the question of the exact moment of its invention, historical records do suggest that the first devices were built around, or slightly before, the year 1300.[11] All throughout the fourteenth century in Europe, large mechanical clocks are installed in churches, as well as city and town buildings, in regions now known as England, Germany, France, and Italy. Before this period, mechanical clocks and their correlated time-form of clock-time do not make any historical appearance in pre-medieval Europe or in the ancient world: clock-time's form of 'abstract time', as Postone points out, 'is historically unique'.[12] As an independent variable with phenomena as its function, abstract time, with its 'division of time into commensurable and interchangeable segments would have been alien to the world of Antiquity and the early Middle Ages',[13] at least in realms outside of learned scientific discussions and practices. A few points with regards to this historical process need clarification.

First, the idea that mechanical clocks were invented in Europe is somewhat counter-intuitive. Medieval Europe was far from being the technological and scientific leader of the world at that time. Chinese and Islamic civilisations were technically and scientifically more advanced. An oft-cited example is the magnificent clockwork *astraria* built by Su Sung as early as 1094,[14] while time-reckoning in Islamic culture was an important religious and commercial matter and led to many technical achievements such as the astrolabe, and important advancements in sundial technology. However, as Landes points out in relation to China (though the point also applies to Islamic societies and ancient civilisations) such accomplishments did not lead to the endogenous development of mechanical clocks, nor to time-keeping practices predicated on abstract clock-time.[15] Moreover, the conception of time as an independent variable

10 See Landes 1983, pp. 15–82; Dohrn-van Rossum 1996, pp. 46ff.

11 Rawlings says 1270 (quoted in Glennie and Thrift 2009, p. 29). Jacques Le Goff (1977) and David Landes (1983) say around 1300. Reviewing historiography on the subject, Dan Falk (2008) says the last decades of the thirteenth century.

12 Postone 1993, p. 202.

13 Ibid.

14 Landes 1983, pp. 17–19; Adam 2004, p. 113; Dohrn-van Rossum 1996, pp. 84–9.

15 Landes 1983, pp. 17–52.

seems to have developed only in Europe.[16] It is only with the Portuguese Jesuit missions of the sixteenth and seventeenth century that mechanical clocks and watches were introduced in China.[17]

Before the advent of mechanical clocks, time-keeping devices mainly consisted of water-clocks, sand-clocks and sundials, and what a modern outlook would consider the 'shortcomings' and 'inefficiencies' of such methods were not overcome. To mention only one example of these 'limitations', clepsydras, in use in many societies, were sensitive to temperature variation, and their flow could be erratic due to uneven water pressure. This would create lags and 'imprecision' from the perspective (a-historical in this case) of equal and constant time-units. Nevertheless, they worked well enough as timers and performed crucial functions in civil life, for example, in the timing of legal and civil procedures in Ancient Greece and Rome, as well as in military life.[18]

Su Sung also used water-clocks in his forty feet high marvel. As many have pointed out, in the case of China, 'telling time' was a prerogative of the Emperor's court, a matter more of political prestige than of temporally organising daily socio-economic relations and activities.[19] In terms of the social usage of time-keeping devices in China, the 'discrepancies' and 'lacks in precision' of such devices could be hidden by political means, and as such did not appear as 'lacks' or 'imprecisions' on their own terms:

> Given the calendrical-astrological objectives of these clockwork astraria, an accurate rate was desirable but not necessary. For horoscopes, the tolerable margin of error is relatively large. What does it matter if the timing of the winter solstice is off by an hour, several hours, or even a day? A great deal in principle; indeed, the very legitimacy of the emperor rested on the harmony of his decisions and actions with the patterns of the cosmos. In practice, though, there was room for error, so long as it was not patent. If the astronomer found an anomaly, the armillary sphere

16 Needham 1981, p. 108; Postone 1993, p. 202.

17 Landes 1983, pp. 37ff; Dohrn-van Rossum 1996, p. 84. 'The mechanical clock escapement was in all likelihood an independent European development, since neither in China nor in the Islamic sphere can we observe a comparable development toward a more elaborate bell technology' (Dohrn-van Rossum 1996, p. 105).

18 On ancient forms of sundials and water clocks and some of their social usages, especially in the Greek and Roman worlds, see Dohrn-van Rossum 1996, pp. 20–8. Hannah 2009 provides the best study of time in Antiquity. For an overview of medieval time-keeping devices from water-clocks to the astrolabe, see Dohrn-van Rossum 1996, pp. 64–96.

19 Landes 1983; see also Postone 1993, p. 205.

> could be adjusted and the calendar corrected. The important thing was the appearance of knowledge, duly certified to the ruler by the court astronomers and proclaimed by him to the people. The criterion, in other words, was political rather than scientific.[20]

It is therefore chronocentric to label Chinese or Greco-Roman time-devices 'imprecise': they met their purpose in terms of precision in the socio-political context in which they were embedded.

In Europe, starting in the fourteenth century, the mechanical clock 'used a falling weight to exert a continuous and even force on the train, which the escapement alternately held back and released at a rhythm constrained by the controller'.[21] Such a mechanism was not only 'freer' from weather fluctuations and problems of water pressure that affected other mechanisms such as clepsydras, it also had a tremendous potential for perfectibility.[22] Indeed, the mechanical clock had a potential for miniaturisation, portability and improved precision, whereas other forms of clocks such as water-clocks, sundials or sand-clocks had a more limited potential for technical improvement.[23]

As Landes has pointed out, much of the historiographical controversy around the invention of the clock revolves around the definition of the mechanical clock that one is actually using. He identifies the 'heart of the clock', what makes a clock truly a clock, not so much in the mechanism of 'escapement', but rather in the use of oscillatory motion to divide 'time' into countable beats.[24] While technical questions obviously have their historiographical importance, what is of interest here is the social aspect of the phenomenon. As such, whether one describes Su Sung's celestial machine as a clock, or gives credence to the speculations that Gerbert had invented the clock by the year 1000, or enquires into the – truly fascinating – marvels of the Greek Antikythera mechanism,[25] or adopts the more consensual point of view which states that the machines built by Richard Stoke, Richard of Wallingford and

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20 Landes 1983, p. 32.

21 Landes 1983, p. 21; see also Glennie and Thrift 2009, p. 30; Dohrn-van Rossum 1996, pp. 45–123.

22 Although it would take some three hundred years before the work on the pendulum of Dutch mathematician Christian Huygens made the technology 'accurate' according to our modern standard.

23 Landes 1983; Adam 2004, p. 113.

24 Landes 1983, p. 11.

25 See Hannah 2009.

Giovanni de Dondi were among the first mechanical clocks,[26] the issue at stake here remains the same: it is in Late Medieval and Renaissance Europe that mechanical clocks first acquire a social function, albeit a very limited one initially. While their use was limited to specific social microcosms, clocks introduced in Europe a form of time-reckoning based on the empty, homogenous and constant abstract time-units of clock-time.[27] Framing the problem in such a way leads one to examine under what conditions clock-time could have had social significance. In this sense, it might very well be that the development of striking mechanisms are even more relevant than the escapement itself, since it is only in relation to the development of hour striking works that the diffusion of public clocks truly began.[28] As such, while historians of technology might debate the invention of the mechanical clock, here the question is posed in terms of the social context in which such an innovation was embedded. To which social interests and needs was such an embedment related?[29] How did it participate in the reproduction of certain groups' power or position? What was the impact of this time-form on the prevailing social time relations?

Following this line of thought, one finds that social conflicts and social-property relations in Late Medieval and Renaissance Europe did create an interest in time-measurement. It is also in this context that clock striking mechanisms acquired a meaning which is possible to differentiate from other acoustic signals in medieval urban contexts. In pre-capitalist Europe, interest in certain forms of time-measurement predicated on abstract time units can be related to prevailing social-property relations and to rules of reproduction for certain factions of the appropriating classes. In his influential account of the origin of clock-time, Jacques Le Goff located the interest in time-measurement in Renaissance Europe in the practices and activities of merchant classes, particularly in the Italian city-states, but also in other European urban centres. According to him, the interest for more precise time-measurement stemmed from the rise of commercial networks in Renaissance Europe, as well as from

26 For more details on these 'legendary inventors', see Dohrn-van Rossum 1996, pp. 54–5, and chapter 2 in Landes 1983. Landes also argues that by the time we get to Dondi and Wallingford's tower clocks, the mechanical clock is already at its third or fourth generation.

27 It is important to note, with regard to mechanical clocks, that before the sixteenth century they were not merely or solely time-keeping devices, but included various forms of religious and cosmological references. Here I focus more on the time-keeping function for the purpose of the subject matter of this enquiry.

28 On the development of the striking mechanisms, see Dohrn-van Rossum 1996, pp. 108–13, 126.

29 In the European context, 'the clock did not create an interest in time measurement; the interest in time measurement led to the invention of the clock' (Landes 1983, p. 58).

class strife over the conditions of wage-labouring practices in urban textile centres.[30]

As one goes over these arguments, it is important to situate these commercial and wage-labouring practices occurring in medieval urban centres and more specifically in the cloth industry in their proper context of pre-capitalist social-property relations. Too often, wage-labour and commerce are treated as intrinsically capitalist, or as embryonic capitalist forms trapped in the interstices of feudal social relations. However, wage-labour is not necessarily capitalist, nor even proto-capitalist, and explanations of the origin of capitalism by merely extrapolating from medieval wage-labouring practices in urban settings remain at best incomplete. In fact, pre-capitalist wage-labour and capitalist wage-labour differ qualitatively. As Comninel points out,

> Every Western society has had markets, and every Western society has had wage-paying labour. Only capitalism has made every normal productive relationship an expression of 'the market'. And only in capitalism are wages not merely the normal means of acquiring subsistence, but a form of income wholly divorced from traditional and normative rules of payment, in principle being exclusively determined by 'the market' through the 'commodification of labour-power'.[31]

Commerce is also qualitatively different from capitalism, especially in the context of Late Medieval and Renaissance Europe. As Ellen Wood points out in the case of appropriating classes in the social-property relations prevailing in highly commercialised Italian city-states such as Florence and Venice,

> they were unambiguously non-capitalist in their mode of exploitation, depending on the coercive power of the city to appropriate surplus labour directly, not only for the purpose of maintaining civic revenues but also for the benefit of urban elites who owed their power and wealth to their civic status.[32]

The commercial classes at the origin of the interest in clock-time thus relied on pre-capitalist modes of appropriation, and despite the unmistakable

30 Le Goff 1977; see also Rifkin 1987, p. 102.

31 Comninel 2000, p. 7. Of course, the *generalisation* of wage-labour as the dominant social form for subaltern reproduction does entail a capitalist mode of production. However, wage-labour in the medieval context is very far from generalised.

32 E. Wood 2003, p. 55.

commercial and financial developments that arose from their activities, they remained non-capitalist classes in that context. As such, it is commercial activities that provide an interest in clock-time, however, these need not be equated with some form of proto-capitalism, or subjected to teleological extrapolation in that regard. In this sense, the interest at the origin of clock-time is pre-capitalist, or, in other words, clock-time is not a creation of capitalism.

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Let us first consider the introduction of mechanical clocks in relation to *work bells*, which were used by medieval employers to delimit work time, mostly in centres of textile production,[33] but also in other settings as well.[34] Indeed, as soon as the early 1300s, work bells are used in such settings, and give rise to conflicts between employers and wage-labourers.

The introduction of these work bells runs parallel to the crisis in the feudal agrarian economy, and also, by ricochet, the crisis of the textile industry in the early fourteenth century. The falling or stagnant productivity on the land and the concomitant decline in the cash incomes of lords meant that the demand for market goods – largely supported by lordly consumption, and therefore dependent on lordly income – would fall, leading to a crucial tension in feudal manufacturing.[35] In the context of urban textile centres, pressure is felt by employers to discipline the workforce more closely, as Le Goff points out: 'Les patrons – les *donneurs d'ouvrage* – en effet, face à la crise, cherchent de leur côté à réglementer au plus près la journée de travail, à lutter contre les tricheries ouvrières en ce domaine. Alors se multiplient ces cloches de travail . . .'[36]

Such work bells had a very precise function related to the particular nature of the textile industry in this period. As Postone points out, the organisation of work in this sector was different from other medieval 'industries', for example, in how it was engaged in large-scale production for export, and how a strict separation between the cloth merchants and the workers was in effect, which

33 Le Goff 1977.

34 See Dohrn-van Rossum 1996, pp. 298–9.

35 As Hilton points out, the productivity *per capita* of the feudal economy in the late thirteenth century is stagnant or falling. Hilton goes on to explain this crisis of feudalism by looking at the very fundamental structure of lordship and its intrinsic limits for economic development (see Hilton 1985a).

36 Le Goff 1977, p. 69. 'Bosses – those who provide work – indeed, faced with the crisis, seek to regulate the working day more precisely, to fight back against worker's cheatings in the matter. This is when those work bells multiply' (free translation).

entailed a (pre-capitalist) form of attention to the productivity of labour.[37] Why was this form of attention to the productivity of labour a 'pre-capitalist' one? Simply because, ultimately, while some level of productivity *per se* did matter, the social power of merchants and the commercial classes did not depend on it, but rather depended on their command over trade networks. As discussed in more detail below, the market here was an *opportunity*, rather than an *imperative*.[38] Indeed, production often adapted to changing conditions and market opportunities, but 'productivity' as we know it, i.e. an *imperative* to regularly increase output per unit, was not a condition for the reproduction of these commercial classes' social power. As Wood has it, 'Trade was conducted on non-capitalist principles, depending not on cost-effective production and enhanced labour-productivity in a market driven by price competition, but rather on extra-economic advantages, such as monopoly privileges'.[39]

Employers would ring the work bells to call the labourers at the start of the day, delimit the duration of mealtime, and signal the end of the workday.[40] Wages being mostly calculated in terms of workdays,[41] employers and wage-labourers developed an interest in delimiting appropriate temporal boundaries for the paid day. In a context of economic stagnation, employers introduced work bells as a tool to regulate and discipline labour more strictly in order to take advantage of market opportunities and to tighten up control over the workforce. Important class tensions would result from the use of work bells throughout the middle part of the fourteenth century, as these disciplining devices multiplied in urban centres.[42]

In France, for example, the work bells of the early fourteenth century caused much strife, as workers and employers fought over their use.[43] Ruling classes proceeded to a series of political moves in order to install work bells in French towns. In 1324 in Gand, a work bell was installed in the hospice. In Amiens in 1335, Phillip VI responded favourably to a request by the mayor to make

37 Postone 1993, pp. 209–10.

38 For a discussion of this distinction, see Wood 2002a and 2002b.

39 E. Wood 2003, p. 56.

40 As Glennie and Thrift point out, time-signalling remains aural; dials, and their visual time-signals, are not an integral part of mechanical clocks until the late seventeenth and early eighteenth centuries (Glennie and Thrift 2009, p. 41). Accordingly, 'telling the time' does not comprise the same set of socially learned skills across the history of clocks and clock-time.

41 Although other wage-labourers, such as servants, would often have their wages paid for in the form of a yearly contract (see, for example, Penn and Dyer 1990, p. 357).

42 See also Dohrn-van Rossum 1996, pp. 297ff.

43 Le Goff 1977; Landes 1983, p. 73.

the bell installed in the belfry the one to regulate the time of labour over and above other bells. Similar processes are found in Douai, St-Omer, Montreuil, Abbeville and Aire-sur-la-Lys. Le Goff points out how the bulk of these processes were located in textile centres.[44]

Why focus so much on work bells when so many other bells are ringing in medieval towns? For example, town dwellers will periodically hear the market bell, the grain bell, urban defence bells, curfew bells, oath bells, the mass and church bells, etc.[45] Town bells were used for social and for political reasons. In medieval towns, their use was strictly regulated and under the control of the ruling elite: 'the authorization to ring the city bells was therefore very strictly regulated in medieval cities, and unauthorized use was severely punished'.[46] Dohrn-van Rossum even suggests that the control over bells was in itself a sign of political control: 'Symbolically, possession of or access to the municipal bells was a sign of *de facto* control'.[47]

Work bells differ from other bells in that their signal is actually detached from other acoustic signals of urban medieval life. As Dohrn-van Rossum puts it, 'With the help of the so-called "*Werkglocken*" (work bells), the time of the day was actually and symbolically detached from the intra-urban temporal order and separated in terms of signalling technique'.[48] Moreover, another distinctive characteristic of the work bells lies in the different formal properties conveyed by their aural time-signals. While diverse town bells convey an *even-emential* form of time-marking, i.e. the marking of episodic points and manifestations of events or danger, the time-marking of the work bell conveys a temporal form akin to a frame, characterised by continuity, 'fullness', constant unfolding; it confines activity inside a frame of time-reference that is dictated not so much by discrete events, but by the constant unfolding of the time of labour between two signals, by the *passage* of constant time and the 'measurement' of the duration of labour.[49] As such, the work bells already prefigured, to some extent, the clock-time of mechanical clocks.

In this context, conflicts developed around the use of work bells. Labourers' anger was directed not so much at the work bells *per se*, but rather at the

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44 Dohrn-van Rossum actually challenges the relevance of this focus on textile centres, and points to other wage-labouring settings as well (see Dohrn-van Rossum 1996, pp. 298ff.).

45 Le Goff 1977, p. 73; Dohrn-van Rossum 1996, pp. 197–215. In its early stages, the work bells were sometimes town bells that were used to regulate work-time (Le Goff 1977, p. 73).

46 Dohrn-van Rossum 1996, p. 198.

47 Ibid.

48 Dohrn-van Rossum 1996, p. 297.

49 Postone makes a similar point: 'Temporality as a measure of activity is different from a temporality measured by events' (Postone 1993, p. 211).

people controlling them. Labourers were, of course, concerned as to whether the work bells, determining the duration of the workday, as well as the duration of breaks and meal-times, rang 'honest' time. Could they trust the employers' bells in that regard? Or could they trust municipal bells for that matter, given that the town councils were mostly formed by employers themselves or their allies? In the period after the Black Death of 1348–50, the dearth of labour for hire gave the medieval wage-labourers an edge in obtaining better work conditions. The most common target of their demands was the silencing of the work bells. Not only did they succeed in some towns in that regard, but they also sought to make use of the bells for their own sake and purposes, and change the social function of the device according to their own interests. For example, at Thérouanne in 1367, an edict promised the wage-labourers that the bells would be 'forever silenced', while at Commines in 1361, a fine of 60 pounds was established for whoever would use the work bells for other usages such as to call an assembly, or revolt.[50] Broader social revolts against city lords had indeed already displayed the centrality of the control over bells in medieval towns, 'revolts against the lords of the city were signalled with the ringing of these communal bells: "1368 – a large, armed crowd arrived . . . and said they wanted to have . . . the seal of the city and the keys to the alarm bells (*sturmgloggen*) (Chronicles of Augsburg)".'[51]

The proliferation of mechanical clocks in town squares and in urban settings was a way to resolve or at least attenuate such unrest around work bells.[52] Indeed, the clock appeared to create a 'neutral' time,[53] time as it 'objectively is' – in opposition to employer-controlled bells. In the context of urban and semi-urban wage-labouring practices, tuning the work bells to such mechanical clocks appeared to prevent the manipulation of the former; accordingly, the wage-labourers might have preferred them over 'arbitrary' bells, while employers could therefore normalise their use of work bells. Even though clocks still worked in an imprecise fashion according to modern standards, they were more precise than any other device at the time in the European context.[54]

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50 Le Goff 1977, p. 71; Landes 1983, p. 74.

51 Dohrn-van Rossum 1996, p. 199.

52 Although the tuning of differing clocks to a 'true' clock reintroduced a further layer of political struggles to the equation, as is shown in Charles V's order to tune all of Paris's bells to the Royal Palace's clock (Le Goff 1977, p. 76).

53 Adam 2004, p. 114.

54 Islamic cultures' non-mechanical time-keeping was more accurate than any European devices at the time (Adam, 2004, p. 113). See also Dohrn-van Rossum's discussion (1996, pp. 30–1).

In the same way that work bells were significantly detached from the 'intra-urban temporal order', the hour-striking of mechanical clocks was also different in nature from the cluster of bells that plunged medieval towns into what has been referred to as an 'acoustic chaos'.[55] Whereas medieval bells conveyed 'practical' time-signals, clock-time's striking of the hour conveyed more 'abstract' time-signals, to use Glennie and Thrift's distinction.[56] This has Rifkin noting that in comparison to the striking of the hour by the first clocks, 'medieval time' was, for its part, 'still sporadic, leisurely, unpredictable, and, above all, tied to experiences rather than abstract numbers'.[57] Moreover, the abstract form of time of these devices made it so that they worked under cloudy or sunny skies, despite rain or snow, and despite temperature variation and freezing conditions, when sundials and clepsydras would not have been of much use. Socio-historically specific concepts and practices of 'neutrality'[58] and 'efficiency' thus seem to have formed criteria presiding over the social embedment of the first mechanical clocks in Late Medieval and Renaissance Europe.

One of the most crucial aspects of this early development of mechanical clocks and clock-time is that we see, in the second third of the fourteenth century, the first social uses of equal hours outside of closed scientific communities, such as astronomers. Prior to this period, hours of equal length 'were used only in the context of scientific discussions, especially astronomical and astrological ones'.[59] The notion of equal or equinoctial hours no doubt existed, but it appears that they were not in use outside of specific and very small learned

55 Glennie and Thrift 2009, p. 186.

56 Glennie and Thrift 2009, p. 37–8. For a different analysis, see Glennie and Thrift's amalgamation of clock-time and bells, in which conceptual distinctions between clock-time and town bells are not made on the grounds that medieval bells implied an aural time-reckoning altogether. Although clock-time and bells were indeed conveying aural signals, I propose a conceptual distinction between episodic time signals and time-signals which convey a 'constant-unfolding' conception of temporality and measure time's passage. See Glennie and Thrift 2009, pp. 82ff., 136–8, 144, 183.

57 Rifkin 1987, p. 101.

58 Neutrality, while apparent in this specific context, is not a 'trans-contextual' feature of clock-time. Consider this scholar's point, speaking of iron manufacturing around 1700: '[T]he correct measurement of the duration of the working day, that is, the definition of time itself, was the prerogative of the employer whose (factory) clock determined the one true time of labour. Thus Crowley's [Iron Works] Law Book stated: "it is therefore ordered that no person upon the account doth reckon by any other clock, bell, watch or dyall but the Monitor's, which clock is never to be altered but by the clock-keeper . . ." ' (Nguyen 1992, p. 36).

59 Dohrn-van Rossum 1996, p. 20.

microcosms.[60] A device in use in these learned communities, such as the astrolabe, which could translate unequal hours into equal hours, and vice-versa, 'did not, however, become an everyday time-measuring device'.[61] Similarly, Hannah remarks that equal time-divisions measurable with sundial technology in Antiquity did not make their way into civil life.[62] As Postone notes, even though water-clocks operated on the basis of the uniform flow of water, prior to the fourteenth century they were used to indicate variable or unequal hours. Practically speaking, it would have been simpler to infer equal hours from the near uniform flow of water, but since social time-keeping was predicated on unequal hours, technical devices were added to water-clocks to have them indicate unequal hours.[63]

Unequal or seasonal hours with varying lengths according to the seasons were the traditional hours in medieval societies: to the extent that time was kept, it was kept according to those unequal hours. Such use of 'temporal hours' was first introduced by the Babylonian civilisation, and they were also used, notably, by the Greeks and the Romans.[64] Within this system of unequal hours, there were inequalities in duration both between day hours and night hours, and between winter and summer daytime (or night time) hours. The twelve hours of the day were not of the same duration as the twelve hours of the night, except on equinox. Moreover, the twelve hours of a summer day would each be longer than each twelve hours of a winter day.

The equal hours of the clock form the very basis of what I call *abstract time*.[65] They each last 1/24th of the full day (day plus night). With clock-time,

60 See also Hannah on the use of 'equinoctial' (equal) hours in Antiquity (Hannah 2009, pp. 74, 114). He quotes an unpublished thesis by D. Edwards, arguing that equinoctial hours are introduced in scientific discussions around the mid-second century BC by the Greeks.

61 Dohrn-van Rossum 1996, p. 79.

62 Hannah 2009, p. 98.

63 Postone 1993, p. 204.

64 Dohrn-van Rossum 1996, p. 18; Hannah 2009. With regards to Greek time reckoning, as Dohrn-van Rossum summarises, 'The Greeks divided the day into three or four segments, which were given designations like "early afternoon", or were named for mealtimes and various activities. For civil use, nighttime had no division at all, for military purposes it was broken down to three or four segments whose length varied with the seasons. It is not clear whether the calendar day began in the evening, or, following popular usage, in the morning. The use of twelve divisions of the day, of temporal hours, and of "hora" as an hour's time is attested only from the time of Alexander the Great' (Dohrn-van Rossum 1996, p. 18). On Greek time-reckoning, see also Hannah 2009.

65 I use this concept in a way similar to Postone's own use. On the concept of abstract time, see also Lukács 1971, and Fischbach 2011, pp. 80–5.

the socially valid definition of an hour will come to acquire its 'equal' mathematical sense, in contrast with the unequal hours that prevailed until then. The equal hours of the clock also contrast with the hour according strictly to the employer's bell,[66] and the (unequal) canonical hours of the Church, which had 'adopted the Roman division of the day and structured the liturgy of daily prayers around it'.[67]

In the wake of the introduction of clocks, abstract clock-time installed in specific spheres of the social realm the *equal* hours previously used in closed, learned, astronomical and astrological circles.[68] Many forms of what Dohrn-van Rossum calls 'modern' hours came to be used in different regions, and all represented various amalgamations between the 'old' unequal hours and features of equal hour reckoning. Various forms of time-reckoning, borrowing from unequal and equal hour forms, therefore coexisted after the introduction of mechanical clocks.[69] Such coexistence gave way to a progressive shift in European public – mostly urban – life from unequal to equal hours in this period. This shift, though not instantaneous, was 'unmistakable'.[70]

In this period, clocks proliferate in European urban centres, predominantly in and under the impulse of Italian cities, to Catalonia, Northern France, Flanders, Germany and Southern England.[71] One can observe in this period the proliferation of clocks and of professions related to clocks; not only clockmakers, but also clock guardians and repairmen.[72] Kings and feudal rulers are active in the process of diffusion,[73] which suggests further that the respective interests of merchants and lords were not conflicting in that regard. Soon, the equal hour of the clock replaces days predicated on unequal hours as the main

66 It is unclear as to whether work bells rang unequal or equal hours when mechanical clocks were introduced. There was probably a transition period (see Postone 1993, p. 211).

67 Dohrn-van Rossum 1996, p. 29.

68 This does not mean that equal hours are more attuned to the cosmos (see Glennie and Thrift 2009, p. 26).

69 Dohrn-van Rossum 1996, pp. 113–17. Dohrn-van Rossum locates the first unmistakable instance of a 'modern' form of public time-reckoning in Milan in 1336 (1996, p. 130). Interestingly, 'Prior to the development of modern transportation systems it [the method of counting twenty-four continuous hours starting at midnight] played virtually no role at all' (Dohrn-van Rossum 1996, p. 117).

70 Dohrn-van Rossum 1996; Glennie and Thrift 2009, p. 26.

71 The spread of mechanical clocks is a pan-Western European phenomenon, occurring on the Continent as well as in England in the same period, with some regions lagging a bit behind others. For a list of the first public clocks, see Dohrn-van Rossum 1996, pp. 129–34.

72 Dohrn-van Rossum 1996, p. 96.

73 Dohrn-van Rossum 1996, pp. 134–5.

unit of the time of wage-labour in several European urban textile centers.[74] The diffusion of clocks thus appears firmly related to the context of pre-capitalist wage-labouring practices, as Le Goff pointed out, and as Dohrn-van Rossum confirms: 'It becomes clear that the problems of working time had given rise to some sort of need for greater precision, which then manifestly promoted the diffusion of clocks'.[75] In this sense, what Le Goff calls the 'new time', the measured time of equal hours, is the historical product of an adaptation to the conditions of urban work, and its diffusion also received part of its impetus from interested feudal lords and Church authorities.[76]

There is a second aspect to Le Goff's thesis. Pre-capitalist employers' interest in more precise time-measurement arises not only from their need to discipline and control wage-labourers in instances where they attend more closely to production – in order to profit from market opportunities. Their interest in time-measurement is also manifested in the broader commercial activities linked with this 'market opportunism', and concomitantly in the development of commercial networks in Medieval and Renaissance Europe. Indeed, the broader context of the 'rise' of merchants and the deepening of commercial networks at that time poses the problem of time-measurement in a particular way. The rules of reproduction of Medieval and Renaissance merchants encourage practices such as 'buying cheap and selling dear' and money lending. Profit is made, for example, on the effective and timely delivery of goods from one market to the other, in a context characterised by the existence of many separate local markets – instead of more unified markets. Importantly, the power of such merchants to appropriate surpluses is based on force, for instance, the military control of trade routes and markets that is itself based on the extra-economic power of city-states or feudal kingdoms, and on civic powers and privileges such as monopoly privileges.[77] In this sense, as Dohrn-van Rossum points out, the 'new time' of merchants 'rose', 'only with a strong assistance from the territorial lords'.[78]

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74 Le Goff 1977, pp. 74–5; Postone 1993, p. 212. The 'day' remains the main unit of time through which wage earners are paid in England until the 1860s (or so the historical data suggests). The 'hour' is not the fundamental unit for wage payment as registered in the data before 1860, while in the period between 1750 and 1869, labour was sometimes charged for by both the day and the hour (Clark 2003, p. 5). However, the work *day* as consisting of *equal hours* becomes the most common practice of wage payment in England over the late Renaissance and early modern period.

75 Dohrn-van Rossum 1996, p. 297.

76 Dohrn-van Rossum 1996, pp. 134–5.

77 E. Wood 2003, pp. 56–7.

78 Dohrn-van Rossum 1996, p. 136.

The enhancement of such commercial activities requires not only knowledge, but also a form of harmonisation of the temporalities, timeframes, tempos and time-patterns implied in the many local markets and trade routes that are involved in such trade practices. For instance, in order to be profitable, the buying and selling must occur at favourable 'moments'. Since the time-practices of different local markets are far from being homogenous or integrated at that time, a more general and 'objective' set of abstract time-units can develop as a means for harmonising, in merchants' activities, different and discrete temporal relations and time-patterns into a more abstract time grid for economic purposes.[79] Also, the duration of the transportation of goods, the fluctuation of prices, and the complexification of the monetary domain add to the social interest for more precise time-measurement.[80] For Le Goff, the new time of merchants takes on the aspect of a reference frame inside which the movement of goods is conceived. Commercial development, alongside the delimitation of work time, therefore formed the basic processes upon which a social interest in clock-time was manifested.

The systematic quantification of time implied in clock-time is a momentous event in the history of time forms.[81] It enables the abstraction of the temporalities, tempos, time sequences and patterns, as well as durations, from the concrete practices and processes to which they belong, and their re-inscription, in a process of commensurability by abstraction, in an abstract framework. Clock-time quantifies timeframes into abstract time-units; it measures, regulates and controls temporality; it rationalises timing, evens out time patterns and controls time sequences.[82] Abstract time makes its entry into social time relations, and with it comes the possibility of making the different qualities of concrete times commensurable. These properties of clock-time will play a crucial role in its relationship to capitalist value formation (more on that below).

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79 Of course, the standardisation of time over vast geographical regions is a process that will be long and tortuous. It will have to wait, as we will see, for capitalism to universalise abstract clock-time, and will not be fully fledged until the late nineteenth century.

80 Le Goff 1977, p. 55; see also Quinones 1972, p. 5.

81 The idea that time is measurable through 'abstract numbering' is, of course, not a novelty of this period. It is commonplace in astronomical and astrological circles since at least Antiquity. For one, Aristotle (1996) had expressed it more than 1600 years earlier, and coincidentally Aristotle's thought is rediscovered in the Western world in this very historical period, most notably with theologians trying to come to grips with the heightening of the social manifestation of interest in time measurement. To reiterate, the novelty here consists in the penetration of equal hours in social time relations.

82 Adam 2004, p. 144.

To summarise, time-measurement in terms of abstract clock-time units is manifested as a need in the rules of reproduction of merchant classes, which thrive on market opportunities granted by military power and politically constituted trading privileges. The fourteenth century 'revolution of the clock' is inscribed in these social practices, rules of reproduction, and forms of social power, so much so that Le Goff does not hesitate to characterise the town clock as 'un instrument de domination économique, sociale et politique des marchands qui régentent la commune'.[83] It is crucial to add to Le Goff's hypothesis the fact that these practices of social reproduction are not conflicting with the rules of reproduction of feudal lords, as the study of the diffusion of public clocks shows that it was amply backed by territorial feudal – and, for that matter, ecclesiastical – authorities.[84] However, as I explain below, although clock-time is socially embedded in the social reproduction of medieval merchants, and its diffusion is broadly backed by feudal appropriating classes, it is by no means socially *hegemonic* in feudal social time relations.

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Le Goff situates clocks at the heart of the 'new time' of merchants, which he counterposes to the time of the medieval Church. This opposition has structured, in a dominant way, narratives of the transition from medieval to modern time. For example, in addition to Le Goff, it is present in varying forms in the works of Yves Renouard, Lewis Mumford and Werner Sombart.[85] In a similar fashion, Jeremy Rifkin depicts the struggle between the Church and medieval merchants as a 'struggle over competing temporal orientations'.[86] Postone

83 Le Goff 1977, p. 56. '[A]n instrument of economic, social and political domination wielded by the merchants who regiment the commune' (free translation).

84 See Dohrn-van Rossum 1996, pp. 197–287.

85 Renouard situates the emergence of modern time in the change in mentality of Renaissance merchants in Italy (Renouard 2009). Sombart establishes the 'public measurement of time' as one of the modernising factors brought about by the development of northern Italian city-states (see Dohrn-van Rossum's discussion in 1996, pp. 10–11). Lewis Mumford, for his part, speaks of a 'machine age' characterised by deep changes in conceptions of time, but also points to the medieval monastery life as a locus of this change, going so far as to suggest that the Benedictines are the founders of modern capitalism (Mumford 1967). Dohrn-van Rossum speaks of the diffusion of clock-time as part of a process of 'urban modernization'.

86 Rifkin 1987, p. 156.

seems to also frame his analysis around such an opposition.[87] In his account, the struggle for cultural hegemony is one between the Church and the urban bourgeoisie. However, this narrative does not do justice to popular culture, and the cultural outlooks of dominated classes. Furthermore, the opposition between 'new time' and 'Church time' might not be as sharp as is usually portrayed. Le Goff's argument no doubt has many strengths, but it also displays a fundamental shortcoming.

Le Goff delves into the thick of the contradictions and conflicts between the new time of merchants and the time of the Church by looking at the strife over practices of usury. Usury is mostly practised by merchants, who are also the money lenders in the medieval context.[88] However, the Catholic Church historically condemns usury, and this condemnation is based on arguments which relate to the Church's conception of time. Indeed, says the Church, the gains made out of usury presuppose a mortgage on time: in other words, money lenders make profit on time. However, time is something that belongs to God. If merchants are 'selling' time, they are thus selling something that belongs not to them, but to God.[89] Moreover, had not Jesus Christ himself said, 'Lend hoping for nothing again'?[90] Somewhat ironically, in such situations the Church will often seek to penalise money lenders by imposing a tax on them.

For the medieval Church, time belonged to God for the good reason that he had created it. Augustine's writings on time formed the ground upon which stood the Church's doctrine on the matter. He had argued that the creation of time was inherent in the creation of the world. 'Before' creation, time did not exist. To those who asked what God was doing *before* creation, Augustine rejoined not with the usual joke that he was creating hell for those who would ask such questions, but answered bluntly that 'before he made heaven and earth, God made nothing': there was simply no 'before' creation.[91] Time was thus a characteristic of earthly matters, whereas God and divinity were situated on a level of a-temporal eternity. The medieval Church's conception of time therefore established a crucial distinction between time and eternity. Put simply, time was a feature of the material world, which would cease to exist in the afterlife, in the immaterial after-world. Time was thus a function of move-

87 Postone 1993, p. 214.

88 Some wealthy and powerful commercial families – such as the Medici family, for example – even sometimes dropped trade altogether to focus their activities on financial services for monarchs and popes, which comprised money lending (see E. Wood 2003, p. 57).

89 Le Goff 1977, pp. 46–7; see also Adam 2004, pp. 125–6.

90 Luke 6:35.

91 Augustine 1961, p. 262.

ment and change in the material, physical world, while there was no change in the after-world. In eternity, everything was 'standing still'. As this scholar of medieval ideas puts it, for the Church 'earthly life is time-bound and therefore transitory; heavenly life is time-less and therefore everlasting'.[92]

Crucially, then, although an 'earthly matter', time belonged to God. He had created it, and the Beginning, as well as the End, were God's attributes.[93] Time was an earthly matter, but as such it was also an expression of God's power. Creation and Apocalypse were manifestations of God himself, 'I am the Alpha and Omega, the First and the Last, the Beginning and the End'.[94] History, according to such a conception, was the history of a fallen humanity through time, a hiatus occurring in a dimension outside of eternity, but still linked to it. It is as if eternity both 'preceded', 'paralleled', and 'came after' time and history; historical time was but a breach, occurring in another realm, that could re-establish a bridge between humans and God, history and eternity. Time began with Creation, followed a linear course through the Fall, the Old and New Testaments up to the present, and would continue until the second coming of Christ. History was the history of the longing for salvation, of grace, and time itself was but the teleological realm of God's Providence: 'the Christian viewed the whole course of Time, from the Creation to the End of the World, as the drama of God's Providence for the human race; hence, to him, history was in essence teleology'.[95] Historical time, as well as human life, here, took the metaphorical form of a pilgrimage.

Le Goff constructs a stark opposition between this 'time of the Church', conceptualised and practised with regard to the sacred and divine, and 'the new time' of the merchants and employers:

> Au temps du marchand qui est occasion primordial de gain, puisque celui qui a l'argent estime pouvoir tirer profit de l'attente du remboursement de celui qui n'en a pas à son immédiate disposition, puisque le marchand fonde son activité sur des hypothèses dont le temps est la trame même – stockage en prévision des famines, achat et reventes aux moments favorables, déduits de la connaissance de la conjoncture économique, des constantes du marché des denrées et de l'argent, ce qui implique un réseau de renseignement et de courriers – à ce temps

92 Lie 2004, p. 202.

93 It is a recurring feature of mythologies and religious thought all over the cultures of the world that time was deified (see Adam 2004, pp. 6–20).

94 Revelation 22:13.

95 Brandon 1965, p. 205.

> s'oppose le temps de l'Église, qui, lui, n'appartient qu'à Dieu et ne peut être objet de lucre.[96]

To the time of the Church, the time 'leading one to God', the time of sin and grace, Le Goff opposes the time of merchants, laic and profane: clock-time.[97] Gradually over the period starting in the fourteenth century, and characterised, according to the French historian, by the rise to social power of the merchant class, Church time will give way to merchant time, i.e. the Church will more or less adopt clock-time in its own doctrines and practices, and its traditional conception of time will evolve accordingly. The example of the relaxation of the condemnation on usury illustrates this thesis.[98] This process is deemed a great fissure in the mental and material structures of the history of Western civilisation. Le Goff therefore inscribes the passage to 'modern time' in a model that situates the rise of the medieval merchant class as the foremost factor in the passage to modernity and/or capitalism.

I want to oppose to Le Goff's diagnosis of ideological conflict between the time of the Church and the time of merchants/employers three points, which rather highlight what they shared in common. These three points are as follows: (1) the elements of continuity between monastic time-discipline and the disciplining of the time of labour by medieval employers – while keeping in mind that they are inscribed in socio-historically specific rules of reproduction; (2) the similarities between forms of subjective experiences brought about by the temporal horizons shaped by the time conceptions of the Church and of merchants; and (3) I want to situate both Church time and merchant time as forms of, to borrow a term from Mikhail Bakhtin, 'official time'. Then, perhaps, what is constructed as a stark opposition, expressing social conflict between 'old' and 'new' classes and encompassing the bulk of medieval social time relations, might be seen from another perspective, namely as but one aspect of ideological struggles between appropriating classes in European feudal social

96 'To merchant time, which is a primordial opportunity for gain, since one who has money considers being able to profit from waiting for reimbursement by the one who does not have any immediately at hand, since the merchant founds its activity on hypotheses based on time itself – storage in anticipation of food shortages, buying and selling at favourable moments, deducted from the knowledge of the economic conjuncture, of constants in the goods and money markets, which implies a network of information and couriers – to this time is opposed Church time, which belongs only to God and cannot be an object of lucre' (free translation). Le Goff 1977, p. 47.

97 Le Goff 1977, p. 56.

98 For the role played by the Reformation in the progressive shift from a conception of time as belonging to God to a conception of time as an object to be saved and a resource to be used, see Weber 1964.

time relations. Church time and the new time might be more complementary than strictly opposed.

First, when talking of 'Church' time, one might also include religious practices and not only doctrinal principles. Such a perspective sheds light on important elements of continuity between Church time – in the form of monastic time-discipline in the Middle Ages – on the one hand, and the time-disciplining of medieval wage-labourers by employers in urban textile centres on the other. Indeed, monastic life was already characterised by a similar use of time-markers as would become the norm in wage-labour relations in urban contexts. Monastic Christianity, as Landes noted,[99] was different from Islam and Judaism in the way that time-measurement was performed.[100] For hundreds of years, there were no formally encoded rules, but only practices of religious time-discipline. The innovators in such practices might very well have been Pachomius's religious order, which in the fourth century inaugurated a strict set of time regulation for eating, sleeping, working and praying.[101] From the deserts of Egypt, these practices spread to other orders, until, in the early sixth century, they were codified in the Rule of Benedict, which instituted a series of standards for monastic life.[102] Daily religious offices and services were regulated in terms of unequal canonical hours. Throughout the following centuries, the Rule of Benedict was normalised across Western Christendom, while of course each order kept its own set of idiosyncratic forms and practices.

Monastic life was thus built around a strong sense of time-discipline.[103] In orders such as the Benedictines, the Clunians, and the Cistercians, among others, the discipline of work and prayer, constituted in a temporal routine, ordered spiritual and labouring life in relation with time-markers. Services and prayers had their proper time, and the punctuality of actions was central to monks' everyday lives. Night time was also subject to time-discipline: the obligation to perform night prayers might very well have led to the invention of the ancestors of one of today's most universally despised time-devices: the alarm-clock.[104]

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99 Landes 1983, pp. 59–60.

100 See also Adam 2004, p. 115.

101 Landes 1983, p. 61.

102 See also Rifkin 1987, pp. 95–9.

103 Time measuring was indeed not only a central part of monastic life, but also a continuous source of problems for the Church in general, as the evolution of calendars and its related problems in that period shows (Zerubavel 1981; Falk 2008, pp. 45–50; Hannah 2009). See also Lie 2004, p. 202.

104 Historical evidence suggests that alarm-mechanisms appear prior to clocks, and not the other way around (Landes 1983; Glennie and Thrift 2009, p. 29). For more details on alarm mechanisms in monasteries, see Dohrn-van Rossum 1996, pp. 60–1.

But punctuality and time-discipline in the monastery was not only a religious, or spiritual matter. It was also an ordering of labouring activities. As Landes summarises,

> The fixing of a daily schedule of prayer was only part of a larger ordering of all monachal activity, worldly as well as religious. Indeed, for monks there was no distinction between worldly and religious: *laborare est orare* – to work *was* to pray. Hence, there were rules setting times for work, study, eating, and sleeping; rules prescribing penalties and penance for latecomers; rules providing explicitly for the maintenance of the clock and its nightly adjustment, so that it would wake the sacristan at the proper time.[105]

Labouring activities – and not merely worshipping activities – performed in monasteries were thus, before the Renaissance period, already characterised by a strong sense of time-discipline, and this point often goes unnoticed in the literature.[106] Monasteries in medieval Europe were not merely spaces of worship cut off from the feudal order. They were also fully fledged productive units: some of them represented amongst the largest productive enterprises in medieval Europe, in sectors as diverse as milling, mining, agricultural production, and manufacturing.[107] Monks prayed and worshipped: but they also produced. Moreover, it was not only the monks who worked; monasteries also made use of hired labour.[108] Surplus was pumped out of monks and hired

105 Landes 1983, p. 67.

106 For a different perspective, see Glennie and Thrift 2009. They do not link monastic time-discipline and labouring practices: 'Much of the monastic impulse to timekeeping revolved around prayers and services, rather than the mechanics of monastic living in itself' (Glennie and Thrift 2009, p. 184). They do not take into account how the distinction between praying and working is not automatic in monastic life, and they might overlook the embedment of monasteries in the feudal order. Monasteries are more often than not structurally organised and socio-economically embedded in feudal property relations in a way that is not so different from 'secular' manorial domains.

107 Dohrn-van Rossum rightly criticises Mumford's depiction of monasteries as 'megamachines', that is, as prototypes of modern factories. Such an anachronistic depiction tends to deform medieval monasticism and the monastic temporal order (see Dohrn-van Rossum 1996, pp. 33–5).

108 Here, the Cistercians are different inasmuch as they generally did not make use of hired labour. They did not have peasant tenants, and rather relied on monks living in dormitories, not household plots, to perform the agricultural work. Cistercian orders were generally more isolated from secular society than other religious orders.

labourers by extra-economic means predicated on religiously constituted authority. This authority rested on the possession of land by the Church in a feudal context where such landed power was inscribed in feudal property relations: most of the time, even after the Gregorian reformation, the authority of the Church on the land was in many regards inseparable from 'secular' lordly prerogatives.[109] The reproduction of the social power of religious orders thus also rested on appropriation of surplus labour by extra-economic means, and as such the Church was a class ally of feudal lords and merchants. In so many cases, lordly and Church power were indeed inseparable: ecclesiastical appointments were made under the supervision of lords, and bishops and other Church officials were *de facto* owners of land. The point here, however, is that monastic authorities and monks time-regulated their labour and the labour that they hired just as they time-regulated their praying and worshipping activities.[110] They used devices such as hydraulic and sand timekeepers, sundials, and bells, and organised monastery life and reproduction with the help of temporal milestones predicated on unequal hours. As such, the time-discipline of medieval monasticism was predicated on *evenemential* time: time here remained a dependent variable, a function of events and processes, rather than an abstract and empty succession of interchangeable units. This point is often overlooked in the literature, especially in accounts which read back industrial time-discipline as a product of the ethos of monks, without properly placing both temporal regimes in their socio-historical context. As Dohrn-van Rossum rightly puts it,

> Despite this density of activities, the ordering of the daily monastic routine got by with remarkably few indications of time. The beginning of the offices was linked not to a particular point in time but to a signal or short sequence of signals ('signa'). The duration of the offices was determined not by a set period of time but by the prescribed liturgical elements. The remaining segments of the day were, in temporal terms, either added on behind the offices or placed in whatever gaps remained. Temporal values were pragmatic values that were not defined. This has led to the problem that modern reconstructions of the monastic day can be no more than

109 Bloch 1989, pp. 350–1.

110 One should not underestimate the social inequalities inside monasteries between, for example, monks, lay brothers and hired workers. Medieval monasteries are not isolated islands cut off from the feudal order: even an order such as the Cistercians, which was founded upon a strict isolation from secular society, was encompassed in the feudal order and displayed internal social inequalities as well (see Alfonso 1991).

> approximations. As for the duration of the elements of the day, it is often overlooked that their timing was intrinsic to them and they were arranged sequentially. Regulations governing time in the Rule [of Benedict] were thus rarely directed towards abstract points of time or abstract periods; the same holds true for the later Rules, often many times longer than the Benedictine Rule, and for the customs (*consuetudines*) that took on binding force. Most designations of time link the beginning of one activity or situation to the end of the previous activity.[111]

In this sense, such temporal disciplining techniques of labour with time-signals and various bells were thus social practices rooted in *both* 'Church time' and 'merchant time'. Monastic time-signalling practices and work bells had proven their efficiency in regulating labour and life in the monasteries for more than two hundred years before they were put to use by employers in the medieval urban context. As was mentioned above, such bells became a source of social strife when the workers refused to 'devote' themselves to their work in the same ascetic way that monks did, but the practice of time-disciplining itself was related in both cases to practices of reproduction of social position. In that sense, it is not only a matter of analysing the conception of time of the Church and opposing it to the temporal practices of merchants. When looking at how Church institutions practiced time-discipline and time-measurement, one sees both commonalities and differences with the temporal practices of Renaissance employers. One could even suggest that the main difference lies in the fact that the mechanical clock and clock-time, as an answer to the need for a 'neutral' time, was not needed in monasteries, as the reproduction by monks' of their social position did not lead to challenges to the authority of a divinely ordained disciplining of time. In a context where time did not appear to be ordered by God, but instead appeared as being ordered by the employer, the usurpation and domination of time became clearer under the rule of work bells: social strife ensued, and it is at this moment that clocks and clock-time made their public appearance as time-regulating devices. The social embedment of clocks and clock-time in that context opened the path to a different form of time, a time that had the potentiality of becoming independent of events and processes. As such, another difference lies in the fact that while monastic temporal order was predicated on evenemential time, on time as a dependant variable, and on unequal hours, one sees the emergence, with so-called 'merchant time', of the prolegomenon of time as an independent variable.

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111 Dohrn-van Rossum 1996, pp. 36–7.

Furthermore, Max Weber has also identified elements of continuity between the time practices of monastic life and the time of the Protestant Ethic. He found elements of continuity between the rationalised conduct of monastic life with regards to time and the rationalisation of time in the Protestant ethic, based in a (predominantly ascetic) 'systematization of ethical conduct'.[112] While the Reformation played an integral part in the shift of time conceptions from Church time to 'new time', Weber recognised that the time ethos of monastic life prefigured the 'new' concept of time articulated in the Protestant ethic, which in turn displays striking similarities with what Le Goff and others have grouped under the heading of 'merchant time'; foremost amongst these similarities is the conception of time as a precious resource to be precisely measured so as not to be 'wasted'. As such, if one brings into the analysis Protestant conceptions of time that were to emerge later, and not solely time as conceptualised and practised under Roman Catholic institutions such as the Vatican or Catholic religious orders, one sees that merchant time and religious conceptions and practices of time, although they differed in important ways, were certainly not as starkly opposed as Le Goff and other commentators would have it.

2) In terms of the subjective experiences brought about by these conceptions of time, other parallels and continuities can be established. The conceptions of time underlying sin, in Church time, and debt, in merchant time, both shape one's subjective temporal relation to sin and debt in similar ways, to take only one example. The sinner enters a time extension characterised by a temporal process of penance where the time-present of his or her actions is framed around his or her longing for forgiveness, his or her expectation to recover purity and absence of sin, to be forgiven by God in the future. The debtor, on his or her part, enters a similar time extension, which involves a process where his or her time-present is one of saving in order to pay back, framed around an expectation of forgiveness (the time of reimbursement). The time-present of the debtor's action is framed around his or her longing for the freedom from the debt bondage. In both cases, sinner and debtor are immersed in a temporality of 'paying back', of experiencing time-present as a time-extension which is subordinated to a time-future. The present time does not serve its own purpose *per se*, but some future one. This framing of time justifying present sufferings on the basis of future liberation is a typical case of temporal political strategies used by 'those in power', as Rifkin terms it, to 'convince the people to accept the time restraints imposed on them by offering them the assurance of a future reward commensurate with the sacrifices being made'.[113]

112 Weber 1964, p. 153.

113 Rifkin 1987, p. 14.

Financial interests and Church power in the medieval period both made use of this strategy. Such examples of the temporal relations and subjective experiences of time involved in the 'time of the Church' and the 'new time' again point to commonalities between the two 'times': they are times that seek to shape and dominate the time of others.

3) Another point in common between Church time and 'new' time is found in the fact that both as forms of social time controlled and regulated by political, religious and economic elites, formed, as I discuss in more detail below, 'official time'. Official time as controlled, regulated, and dictated by appropriating classes therefore displayed characteristics of temporal domination, and one does find in 'official time' some pre-capitalist forms of time-discipline. But as I discuss below, the existence of such a form of 'official time' is still far from implying a systematised or hegemonic form of temporal alienation in pre-capitalist Europe. In pre-capitalist social time relations, there is also a 'non-official' time, a *processual concrete time*, governing the bulk of productive practices and popular culture. Appropriating classes in that context do not appropriate surplus through an apparatus reproducing temporal alienation, although the Church and commercial interests do develop strategies to reproduce their social power in which temporal domination is displayed through the creation of an 'official time'.

As such, in opposing the time of merchants to the time of the Church, Le Goff points to a fundamental aspect of the evolution of social time relations in the Middle Ages. However, although he recognises that the time of merchants that slowly erodes the 'dominance' of Church time in medieval consciousness is but a small part of the broader medieval time consciousness, he does not identify the conceptions and practices of time which permeate 'unofficial' life and which, as a matter of fact, govern much of the practices that reproduce feudal societies. The traditional emphasis of historiographical narratives on dominant cultures, classes or figures tends to obscure the views and practices held and performed by common people throughout history. Social history 'from below' points to the ways in which conceptions which allegedly ruled previous periods of history were always contested if not outright marginal when considered in terms of the sheer number of people who held them. For a broader picture of European medieval time(s), one might look at the history of popular culture, in order to find often neglected conceptions and practices of time which can be reinstalled in historical narratives and theoretical discourse. The real contrast and struggle here might not be between the time of merchants and the time of the Church, but rather between *official time* – comprising both 'Church time' and the time of merchants – and *processual concrete time*, the time of life on the land, the time which springs out from the bulk

of social and (re)productive life and that is expressed in cultural forms such as grotesque realism, identified by Mikhail Bakhtin as the paradigmatic world-view of Western European medieval popular culture. More on this shortly.

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One important thing to keep in mind is that the *emergence* of clock-time should not be confused with its *universalisation*. The 'revolution of the clock' of the fourteenth century is not actually a 'revolution' in the sense of a sudden and widespread change. Adam also posits that the 'revolution' of the clock is a subtle one, 'which crept up onto people and practices',[114] while Postone suggests that 'abstract time' did not 'become generalized until much later'.[115]

Le Goff himself nuances the 'revolutionary' character of 'merchant time' when discussing the spread of mechanical clocks and the social struggles over the time of labour in medieval Europe:

> Ici encore il ne faut pas exagérer. Pour longtemps encore le temps lié aux rythmes naturels, à l'activité agraire, à la pratique religieuse, reste le cadre temporel primordial. Les hommes de la Renaissance – quoi qu'ils en aient – continuent à vivre dans un temps incertain. Temps non unifié, encore urbain et non-national, en décalage par rapport aux structures étatiques qui se mettent en place, temps de *monades urbaines*.[116]

This highlights the isolated and relatively modest character of the 'revolution of the clock' when put in the broader context of pre-capitalist society.[117] Le Goff then continues:

> Ce qui le souligne c'est la diversité du point de départ du temps nouveau, de l'heure zéro des horloges: ici midi et là minuit, ce qui n'est pas grave, mais plus souvent le lever ou le coucher du soleil encore, tellement le temps préindustriel a de peine à décrocher du temps naturel. Montaigne,

114 Adam 2004, p. 112.

115 Postone 1993, p. 212.

116 'Here one should not exaggerate. The time linked to natural rhythms, agrarian activity, religious practice, remains the primary temporal framework. Renaissance men – even though they have some – still live in an uncertain time. A non-unified time, still urban and non-national, lagging behind state structures, which are being laid down, a time of *urban monads*' (free translation). Le Goff 1977, p. 75.

117 See also Postone 1993, p. 212.

> dans le *Voyage en Italie*, après d'autres voyageurs des 15è et 16è siècles, note la confusion, le désordre qui naît de ce temps à l'origine changeante d'une ville à l'autre.[118]

So, not only is clock-time not directly affecting the bulk of human (re)productive activities in that context, it is also confined to small geographical spaces and significantly changes its forms from one urban location to the next.

Importantly, the historical spread of clock-time to the social field should not be seen as merely a progressive quantitative increase of clocks and clock-time practices. There is a qualitative gap between pre-capitalist clock-time and capitalist clock-time, the latter having been brought about by the fusion between clock-time and processes of capitalist valorisation, which has led to the rise of clock-time to a *hegemonic* position in capitalist social time relations. This qualitative difference revolves around the question of the universality of clock-time as a social regulator – i.e. its direct involvement in value formation, in appropriation, as well as its unification across space, which will make it the hegemonic time-form in capitalist social time relations – while clock-time is neither hegemonic nor universal in pre-capitalist social time relations. Later, I will argue that the 'real' revolution of the clock occurs with the consolidation of industrial capitalism, and that it is capitalism that truly 'revolutionises' social time relations. As such, just as capitalism is not the result of a quantitative growth in trade and commerce, but rather of its mediation through a qualitative reconfiguration of social-property relations, so is the rise to social hegemony of clock-time not the product of a quantitative spread of clocks or clock-time practices, but rather of the qualitative reconfiguration of social time relations brought about by the embedment of clock-time in the formation of value.

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118 'What underlines it is the diversity of the beginning point of this new time, of the zero hour of clocks: here noon and there midnight, which does not make such a big difference, but more often sunrise or sunset still, as preindustrial time cannot quite escape from natural time. Montaigne, in *Voyage en Italie*, after other travellers in the fifteenth and sixteenth centuries, notes the confusion, the disorder which is born from this changing origin of time from one city to the other' (free translation). Le Goff 1977, p. 75. The second part of the quote highlights the geographical unevenness of social time, which would remain until much later.

Although clocks and clock-time started to regulate feudal wage-labouring practices in certain sectors of medieval manufacturing from the early fourteenth century onwards, it has to be kept in mind that over eighty to ninety percent of the population of medieval Europe were peasants labouring the land in rural settings.[119] Clock-time did not regulate these practices. The bulk of medieval life therefore remained anchored around social time relations predicated along the organising structures of feudal agricultural (re)productive activities where, for example, leisure, social intercourse and work time were not separated. Producers did not even out their efforts to make it constant according to abstract equal time-units, as is typical of labour under a clock-time regime; rather, most of the 'work pattern was one of alternate bouts of intense labour and of idleness, wherever men were in control of their own working lives'.[120] These social time relations remained closely related to the organisation of agrarian production. Throughout the medieval period, labouring activities, except for small and specific microcosms, remained predicated on cycles of day and night, on the passage of seasons, the cycles of birth, decay and death of people, animals, plants and crops; light and dark, heat and cold, health and sickness; the traditional skills of artisans and labourers and their respective concrete temporalities and time, the concrete times of household reproduction; in a word, the concrete times of the land and of life on the land.

In such a setting, as one could expect, weather and time are closely related, and some languages have kept this homonymic relation between them. A French speaker, for example, will refer to the weather as '*le temps qu'il fait*', one will often hear, in francophone weather forecasts, expressions such as '*le temps sera doux*', '*nous prévoyons du beau temps*', or '*quelques jours de temps pluvieux*'.[121] This illustrates how time here appears as a quality – a cluster of sensuous experiences and socio-natural processes whose rhythms inform the concrete times of life on the land – rather than a quantity or a series of empty quanta. In a similar way, as Le Goff reminds us, pre-capitalist agricultural labour and societies remained, for the most part, settings in which the expense of labour remained in a strong sense *qualitative*, not *quantitative*:

> En gros le temps de travail est celui d'une économie encore dominée par les rythmes agraires, exempte de hâte, sans souci d'exactitude, sans inquiétude de productivité – et d'une société à son image, sobre et

119 Hilton 1985a, p. 121.

120 Thompson 1993, p. 373.

121 Which could be translated as 'the present weather', 'the weather will be nice', 'a beautiful forecast', and 'there will be several rainy days', respectively.

> pudique, sans grands appétits, peu exigeante, peu capable d'efforts quantitatifs.[122]

Clock-time did not hegemonise time relations in such a context where most human activities were predicated on concrete times. This can be explained in part by the relative absence of control by the appropriators (lords) over the actual labour process,[123] and by the fact that socially necessary labour time (more on this below) exerts its power specifically in capitalism.[124] I have pointed out how in urban textile centres, the work bells and clocks were used by employers to temporally discipline the workforce – in a limited and contested process – in order to take advantage of market opportunities. The time of labour was disciplined to some extent by the employers, while the labour process itself remained to a large extent under the labourers' control. In an even clearer fashion, in the countryside, and as such in the bulk of medieval productive practices, lords do not supervise, control or manage the labour processes: their social power and control over the peasants rather takes the form of political, military and legal powers of appropriation, which do not entail the control over the labour process *per se*. In other words, these 'extra-economic' powers of appropriation are not matched by any 'economic' power over labour *per se*. The extraction of surplus from peasants by lords is performed by 'extra-economic' means – be they raw military power, political status, religiously constituted authority, or legal constraints – and the specific forms taken by the powers of appropriation vary from one specific feudal context to another. As Hilton points out,

> lords, with their armed retainers and their far-reaching private or public jurisdictions, had by no means complete control over the servile peasantry. In particular, their military and political power was not matched by their power to manage the agrarian economy . . . [H]e [the lord] was not able to determine the application of labour and other resources within the economy of the holding.[125]

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122 Le Goff 1977, p. 68.

123 Labour process is here understood in Marx's terms, as '(1) purposeful activity, that is work itself, (2) the object on which that work is performed, and (3) the instruments of that work' (Marx 1976, p. 284). I add to this the concrete times entailed in the labour process itself. Interestingly, it should be pointed out that although lords did not directly control labour processes, in the open field system they were sometimes fixed by law, thus creating, to some extent, a form of 'legally official time' predicated on agricultural and seasonal temporal relations.

124 Tombazos 2013, p. 64.

125 Hilton 1985a, pp. 125–6.

This fact is also illustrated by the relative absence of productivity gains in agricultural production in this period.[126] Indeed, whereas some economic theories tend to ascribe capitalism's relentless drive for increasing productivity and technological development, its 'constant drive to revolutionize the productive forces', indiscriminately to other social systems, actual figures of the feudal (lack of) agricultural productivity gains have been well underlined by economic historians: 'The inertia of medieval agricultural technology is unmistakable. Some progress there was, but it was, so to speak "bunched" into certain periods at the beginning and end of the era. Over the Middle Ages as a whole it was slow and uneven'.[127] This lack of technological and labour-productivity gains is related to the prevailing social-property relations and their specific rules of reproduction, which directed surplus investments toward 'political accumulation', i.e. the strengthening of the lords' 'extra-economic' apparatus of surplus extraction and war-making capabilities,[128] instead of directing the surplus to investment and innovation in agricultural production *per se*. In Brenner's words,

> The inability of the serf-based economy to innovate in agriculture even under extreme market pressures to do so is understandable in view of the interrelated facts, first, of heavy surplus-extraction by the lord from the peasant and, secondly, the barriers to mobility of men and land which were themselves part and parcel of the unfree surplus extraction relationship . . . [T]he lord's most obvious mode of increasing income from his lands was not through capital investment and the introduction of new techniques, but through squeezing the peasant.[129]

In such a context, the time of feudal agriculture was not subjected to the spread of social temporalities predicated on productivity, or on the control of the labour process by the appropriating class.

E.P. Thompson referred to the temporal organisation of work in pre-capitalist peasant societies as 'task-oriented'.[130] By this he meant that the time of work seemed to be dictated by the concrete tempos, time patterns and

126 'Productivity gains' being here understood as the kind we would expect in capitalism, through investment in productive techniques or crops, for example. However, the open field system, in the period from roughly 1050–250 unmistakably saw an increase in *social* productivity. For more on this, see Comninel 2012, pp. 131–7.

127 Postan 1975, p. 73.

128 Teschke 2003; Tilly 2000.

129 Brenner 1985a, p. 31.

130 Thompson 1993.

time extensions of the tasks at hand. This is a crucial insight about concrete times; however, Thompson's statement might need to be amended, since the sheer diversity of temporal systems found in peasant societies all over the world might prevent one from bundling all of their varied and diverse relationships to concrete times under one notion of 'task-orientation'.[131] One might be more specific to European medieval 'landed' temporalities by looking at medieval and Renaissance cultures of folk humour in Bakhtin's work, its paradigmatic aesthetic imagery of grotesque realism, in order to sketch out its processual concrete time. Accordingly, continuing along the path opened up by Thompson's and Bakhtin's insights, there might emerge a clearer picture of pre-capitalist time in Europe than the one sometimes found in accounts which speak of the old European world as merely displaying 'a vast indifference towards time'.[132] Furthermore, in such an endeavour, one needs to avoid simple oppositions such as a rural natural time superseded by an urban clock-time, since 'natural time', in any case, is always already socially mediated. The distinction between urban and rural is often misleading when talking about time-reckoning,[133] and this is one reason why this discussion is framed around the distinction between official time and processual concrete time.

A fruitful way to look at the conceptions of time of the medieval peasantry and town-dwellers is to mobilise Bakhtin's discussion of grotesque realism. In his study on Rabelais, Bakhtin re-inscribed the great writer's oeuvre in the context of this popular cultural form. Through his notion of grotesque realism, an aesthetic concept which encompasses the imagery and form of this popular culture, Bakhtin highlighted its bodily materiality and the concreteness of its conceptions and images of life and temporal cycles, at odds with the abstract and linear character of 'official' cultural forms in this period. What is interesting in Bakhtin's concept is that it covers the later period of the Renaissance: some 150 to 200 years after the introduction of clock-time in pre-capitalist social time relations. Crucially, then, one can observe that clock-time has not penetrated popular culture and the bulk of productive practices. It has not imposed its temporal framework on it; it has not colonised it in any notable way. Indeed, conceptions and practices of time expressed in grotesque realist culture are oppositional to both Church time and merchant clock-time; they

131 See, among others, Smith's nuances with regard to 'task-oriented time' in Japanese Tokugawa peasant communities (Smith 1986). For a more general critique of Thompson's article, see Glennie and Thrift 1996.

132 Bloch 1989, p. 118.

133 Glennie and Thrift 2009, p. 176.

do not display signs of a social embedment of clock-time in the bulk of productive life.[134] This processual concrete time is a fundamental – but much overlooked – part of pre-capitalist social time relations.

The popular culture of folk humour is not an isolated or marginal phenomenon. 'The scope and importance of this culture', writes Bakhtin, 'were immense in the Renaissance and the Middle Ages'.[135] Manifested in carnivals and comic spectacles and rituals, it is also strongly oppositional:

> all these forms of protocol and ritual based on laughter and consecrated by tradition existed in all the countries of medieval Europe; they were sharply distinct from the serious official, ecclesiastical, feudal and political cult forms and ceremonials. They offered a completely different, non-official, extraecclesiastical and extrapolitical aspect of the world, of man, and of human relations; they built a second world and a second life outside officialdom, a world in which all medieval people participated more or less.[136]

The popular culture of folk humour expressed very distinct and rich conceptions and practices of time.[137] First, this culture focused on what Bakhtin terms 'the material bodily lower stratum', and was predicated along notions of sensuousness and a tone of play. It was manifested through carnivals, comic verbal compositions and some specific manifestations and genres of 'familiar speech'. Carnivals are of special interest here, since they point to a specific practice

134 Although the dualism that Bakhtin constructs between popular and official culture must, as McNally (2001) has argued, be submitted to critique in order to show how opposing cultures might blend and mix, the point remains that Bakhtin offers us a clear example of how the focus on the time of merchants and the time of the Church as the main oppositional struggle in medieval social time relations occludes the very cultural practices which defined the temporal experiences for the majority of the population in the Middle Ages. Also, even though 'official' and processual concrete times in medieval social time relations might blend and mix, clock-time as embedded in the social reproductive practices of certain ruling classes do not appear to have replaced, or blended with, to a significant extent, the processual concrete time of popular culture.

135 Bakhtin 1984, p. 4.

136 Bakhtin 1984, pp. 5–6.

137 I here focus on carnivals and folk humour as they relate to the oppositional culture with regards to official time, but it should be noted that these also display strong oppositional practices and conceptions in terms of sexual repression and social hierarchy in general. The focus on time is not meant to downplay these other features.

of time in medieval life. Carnivals were not mere spectacles, although they were full of them; everyone participated in carnivals, life was absorbed by their rules and forms characterised by freedom from religious and official piety and oppression, as well as by the temporary suspension of all hierarchic distinctions and official temporalities, be they religious, civil or political. This time of freedom of the carnival shaped medieval people's temporal experiences to a great extent. Even in purely quantitative terms, on average three months a year were devoted to such festive suspensions of official hierarchies and times.

Every image and form of official culture, including existing official times, were subject to the laughter of folk humour. To such official times was opposed a processual concrete time of bodies and the lower material bodily stratum, with its grotesque images and forms of defecation, bellies, eating, sexual intercourse, birth and death. In such a cultural form, this bodily element is not gross or disgusting, but rather the opposite: 'in grotesque realism, therefore, the bodily element is deeply positive'.[138] The temporal life manifested through this body is the 'continually growing and renewed' life of the people, it 'refers not to the isolated biological individual, not to the private, egotistic "economic man", but to the collective ancestral body of all the people . . . the material bodily principle is a triumphant, festive principle, it is a "banquet for all the world" '. The laughter of grotesque realism degrades and materialises, it brings back what is 'ideal' and 'heavenly' to materiality, to the earth and the body that 'swallows up and gives birth at the same time'.[139] In terms of temporality and time, then, grotesque realism is predicated not on the times of religious, political and economic elites, but rather on an opposition to such official forms based on the concrete social time of the unfolding socially mediated processes of renewal of nature, the collective ancestral body, and the material bodily principle.

The medieval feasts are particularly telling phenomena in this regard: while official feasts sanctioned existing patterns of power relations, carnival feasts created 'a second life for the people, who for a time entered the utopian realm of community, freedom, equality, and abundance'. Accordingly, each form of feast was linked to a different conception of time.[140] The *official* feasts of the Middle Ages – be they ecclesiastic, feudal, or state-sponsored – had a *formal* link to time. These feasts 'asserted that all was stable, unchanging, peren-

138 In a similar register but in a different (African) context, 'obscenity', noted Evans-Pritchard, 'gives stimulus and reward to the workers during periods of joint and difficult labour' (quoted in Thomas 1964, p. 54).

139 Bakhtin 1984, pp. 19–21.

140 Keith Thomas notes the resolutely 'pre-industrial' character of feast time, as well as the reversal of social roles occurring in such settings (see Thomas 1964, pp. 53–4).

nial: the existing hierarchy, the existing religious, political, and moral values, norms and prohibitions'.[141] They made use of the past to consecrate the present, eternalising it as an indisputable order. The *popular* feast, in contrast, was *essentially* related to time, 'either to the recurrence of an event in the natural (cosmic) cycle, or to biological or historic timelines'.[142] Death, birth, survival, change and renewal characterised the temporality of the popular feasts that were based on such natural, social and personal events.[143] Bakhtin tells us that

> The grotesque image reflects a phenomenon in transformation, an as yet unfinished metamorphosis, of death and birth, growth and becoming. The relation to time is one determining trait of the grotesque image. The other indispensable trait is ambivalence. For in this image we find both poles of transformation, the old and the new, the dying and the procreating, the beginning and the end of the metamorphosis.[144]

Such conceptions and practices of time and their focus on concrete temporalities contrasted sharply with the official culture of time:

> As opposed to the official feast, one might say that carnival celebrated temporary liberation from the prevailing truth and from the established order; it marked the suspension of all hierarchical rank, privileges, norms, and prohibitions. Carnival was the true feast of time, the feast of becoming, change, and renewal. It was hostile to all that was immortalized and completed.[145]

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141 The history of 'official' holidays is full of examples of its political implications. For instance, the very fact that Christmas is celebrated on 25 December stemmed from the Church's desire to challenge and overcome pagan winter solstice rituals.

142 Bakhtin 1984, p. 9.

143 It is important to note that the temporality of Renaissance grotesque realism is not simply a cyclical one. Although archaic forms of grotesque realist images do emphasise the cyclical temporality of natural and biological life, with an imagery of seasons, sowing, reaping, growth and death, over the millennium through which these images evolved, the consciousness of social and historical time was integrated in the cycles: a sense of historic time came to complement a cyclical conception of time. In the Renaissance period, 'the grotesque images with their relation to changing time and their ambivalence become the means for the artistic and ideological expression of a mighty awareness of history and of historic change which appeared during the Renaissance' (Bakhtin 1984, p. 25).

144 Bakhtin 1984, p. 24.

145 Bakhtin 1984, pp. 9–10.

This popular time shaped and filled feudal social time relations to a great extent, and was opposed to the dominant conceptions and practices of time held by ruling classes such as the 'new time' or the 'time of the Church'.

Therefore, there's more to pre-capitalist Western European social time relations than ascending proto-capitalist conceptions and practices of time slowly eroding and colonising mutating conceptions and practices of time related to the Catholic Church. Social time relations in this period should rather be viewed as a struggling entity in which these two forms contrast sharply from the conceptions and practices of time of popular realism and those permeating the bulk of productive life. Thus, alongside the conceptions of time that Le Goff and most of historiography place at the apex of the Middle Ages, namely the time of God and of Church theology and practices, the evenemential time of town bells and monastic life, and the constant uniform time of merchants, there is a whole other time: the processual concrete time of popular folk culture and socio-material productive practices. All these times are part of the cluster of struggling conceptions and practices of time that were found in late medieval Western European social time relations.

Le Goff's shortcomings stem in part from the fact that he mistakes pre-capitalist urban commodity production for the birth of capitalism. He thus cannot appreciate the qualitative difference between capitalist and pre-capitalist social time relations; he retrospectively reads clock-time as being motivated by 'capitalist' enterprise in pre-capitalist processes. In the same line of thought, Robert Hassan, in his otherwise penetrating work, reads back medieval merchants as the 'nascent capitalist class', and the spread of clock-time is seen as just the inevitable outcome of the emergence of capitalism from the quantitative expansion of trade and commerce,[146] which leads him to not fully appreciate the specific relationship between clock-time and capitalism, and differences between pre-capitalist and capitalist social time relations. For all their immense value as ground-breaking studies and analyses, these works seem to take capitalism for granted as the inevitable outcome of a quantitative growth of trade and commerce, while similarly clock-time hegemony stems from a quantitative increase of clock-time practices. Meanwhile, the 'why' question – i.e. why did clock-time go from subtle to revolutionary, from isolated to hegemonic – is not rooted in a historically informed qualitative distinction between pre-capitalist and capitalist social time relations, nor is it systematically tied to an examination of the relationship between clock-time and capitalist value rooted in historically

146 Hassan 2009, p. 54.

specific social-property relations, which will give clock-time its truly 'revolutionary' and 'hegemonic' impulse.

While the time of labour was 'organised' in pre-capitalist wage-labour practices in specific social microcosms where merchants adapted production in order to profit from market opportunities, the proportion of the total social time of labour affected by this process is not very significant, and neither is the level to which the labour process itself is 'clock-time-disciplined'. When contextualising pre-capitalist wage-labour, as well as identifying the temporality of popular culture (associated with the bulk of productive life) as one fairly devoid of the influence of clock-time, one reaches the conclusion that the 'revolution' of the clock of the fourteenth century did not amount to a once-and-for-all shift in the time conceptions and practices of European societies, and that clock-time remained in a non-hegemonic position in pre-capitalist Western European social time relations.

Therefore, the totalising logic behind clock-time in the capitalist period is not an inherent function of clock-time *per se*. Abstractions do not become totalising 'on their own'. It is in specific social contexts that abstractions can acquire a power of their own. Capitalism provides such a social context in which alienated social relations (re)produce abstractions and reification. As discussed below, capitalism changes clock-time's position in social time relations: capitalism universalises clock-time and makes the latter hegemonic.

In the period of the spread of mechanical clocks and clock-time, one observes forms of temporal domination, as well as social conflicts occurring around such processes. However, temporal alienation is not a systematic or hegemonic feature of pre-capitalist social time relations. Glennie and Thrift seem to share this view: 'Of course, this is not to say that the mechanical clock did not disrupt people's consciousness of time in the late Middle Ages. It did. But it did not create a "modern" time, or a "universal" time'.[147] When there are no capitalist relations, or when they are not the dominant social-property relations in society, one does not observe the unification of clock-time into a hegemonic time-system. Commodity production and clock-time are thus, logically and historically, intimately related. But in a non-capitalist context, clock-time and commodity production stay confined to microcosms, and their relation, predicated on the time of labour but not yet on the labour process itself, is not *systematic*. Relatedly, in terms of geographical spread, clock-time affects only unconnected urban monads prior to capitalism.[148] In summary, while clock-time arises from social conflicts and property relations dynamics associated

147 Glennie and Thrift 2009, p. 91.

148 Dohrn-van Rossum 1996, p. 323; see also Le Goff 1977.

with commodity production, its universalisation and rise to hegemony will not occur until social-property relations take on a fully capitalist character.

2 The Transition from Feudalism to Capitalism

In order to assess the relationship between clock-time and capitalism, or in other words to identify the socio-historical processes at the root of the universalisation of clock-time in capitalist societies, some historical ground needs to be cleared with regards to the origins of capitalism. To define 'capitalist time' requires a definition of capitalism, and as pointed out in the previous sections, it cannot be reduced to the inevitable outcome of a quantitative growth of feudal commercial activities. Rather, agrarian capitalism, as identified by historian Robert Brenner, represents a historical transitional phase from feudalism to capitalism. This transitional phase is of interest here because it highlights some of the specificities of capitalism, as well as some of its basic features. Agrarian capitalism, however, is not a fully-fledged capitalism, nor did it develop fully-fledged capitalist social time relations.

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The question of the transition from feudalism to capitalism has produced some heated historiographical debates. The orthodoxy in social history revolving around demographic and commercial models of the transition to capitalism has been, however, challenged by the work of Robert Brenner in the 1970s and 1980s. Brenner's work, in the 'transition debate', proposed that capitalism emerged in the English countryside, as a product of qualitative changes in the agrarian class structure, from the late fifteenth century onwards.[149]

Brenner's concept of 'agrarian capitalism', as the transitional phase between feudalism and capitalism, points to specific processes occurring in the English countryside in that period, displaying an increasing separation of producers from the means of production and means of subsistence, and a growing dependence on the market of both producers and appropriators for their social reproduction. Concomitantly, market imperatives emerging from the commodification of (access to) land gradually spread to the social field. In this context, the strategies employed by both appropriating and producing classes

149 Brenner 1985a.

to reproduce their social position give rise to capitalist social-property relations in which the market will come to play an integral part.

The 'agrarian class structure' that Brenner identifies as being central to this whole process is the oft-cited agrarian 'triad' composed of lords, tenants and wage-labourers. It was itself the result of historical processes shaped by class conflicts over the appropriation of surplus labour.[150] This class structure was not a pan-European development; rather it was specific to the English countryside. According to this understanding, the specificity of the English agrarian class structure is the crucial factor in the endogenous development of agrarian capitalism. Indeed, as Wood points out, 'European feudalism in Europe was internally diverse, and it produced several different outcomes, only one of which was capitalism'.[151]

This historical understanding points to the English/agrarian origins of capitalism, in contrast with narratives that see capitalism as the quantitative acceleration of – mostly urban – processes (commerce and trade) that were 'fettered', in one way or another, under feudal social relations. In such accounts, which emphasise the 'un-fettering' of always already capitalist processes, capitalism is often seen as a pan-European, undifferentiated outcome of feudalism. Quantitative explanatory narratives such as these tend to focus on urban centres as the birthplace of capitalism. A major problem with these explanatory models is that they take capitalism for granted instead of explaining how it came about. In other words, capitalism already existed and merely needed to be freed from its feudal shackles. Brenner's historical approach avoids these pitfalls, and in so doing his thesis undermines both the presupposition that capitalism is a pan-European outcome of feudalism, and that its origin is a predominantly urban phenomenon.[152]

The thesis of agrarian capitalism also discards narratives which tend to imply that capitalism was the product of a more 'advanced' stage in economic development, or even cultural refinement, that would have been specifically (pan-)European. There have been, in history, many civilisations around the

150 Brenner 1985a and 1985b; Comninel 2000; E. Wood 2002a.

151 E. Wood 2002a, p. 73.

152 See also E. Wood 2002a, p. 74. A good headway into deconstructing the assumption that capitalism=city is to disentangle the couple city=commodity production. Although we have seen how urban centres seem to be privileged centres of manufacturing in the Middle Ages, the example of the shift of the manufacturing industry in late medieval and early modern England from the urban centres to the small towns and villages where there is a growth of small-scale commodity production gives us a clue as to their importance during the transition to capitalism (Hilton 1985a, p. 136).

globe that have developed social structures that one could qualify as more 'developed', or 'sophisticated', commercially, scientifically and technologically, than English feudalism. Once it is recognised that capitalism is not the product of the march of freedom and progress, or of a quantitative growth of material wealth, or cultural and social sophistication, or 'urban rationality', or of the 'autonomy' of urban centres that were thus able to 'free' themselves from 'fettering' rural feudal social relations, but rather is the unintended result of a specific qualitative configuration of social relations, there remains no ground on which to base any argument implying some form of European predisposition to capitalism and modernity.

An increase in market activities is therefore not sufficient in itself to bring about capitalist markets, since capitalist markets are qualitatively different from non-capitalist markets. One fruitful way to tackle this question of qualitative difference between commercial markets and capitalist markets is to pursue the distinction, touched upon earlier, between market *opportunity* and market *dependence*.[153] Markets have existed throughout world history in many different contexts, times and places, without leading to capitalism. As discussed earlier, medieval and Renaissance commercial markets, for example, were opportunities for appropriation by medieval merchant classes, which used politically and militarily constituted privileges to secure their control over parts of networks of trade and commerce. Local markets were also an opportunity for peasants to sell their surpluses. Hence, in the context of European feudalism, market opportunity refers to the existence of both international markets in luxury and other goods, and local markets in which peasants could sell surpluses. Such market exchanges were common, and their role in fuelling monetisation explains why lords could ask for cash rents. However, a crucial qualitative point is that producers did not *depend* on the market for survival. They had direct access to their means of subsistence, which they employed to produce the bulk of what they consumed. Merchants, for their part, thrived on market opportunities, but were not subjected to a unified market driven purely by a price competition imperative. Lords did not depend on markets for the reproduction of their social power as lords. Instead they resorted to strategies of political accumulation and developed 'extra-economic' means to appropriate surplus from peasants. Pre-capitalist markets in this socio-historical context were in this sense an opportunity. Market dependence, contrastingly, is distinctively capitalist, and is based on market imperatives: producers are compelled to sell their labour power on the market to survive, since direct access to their means of reproduction and means of subsistence has been

153 See also E. Wood 2002b.

severed. Appropriators, for their part, depend on the market both to appropriate labour power and to realise surplus value. They are subjected to the imperatives of price competition in a more unified capitalist market compelling them to follow rules of reproduction predicated on cost-effective production and labour productivity.[154] These market imperatives thus form an integral part of the rules of reproduction of both producing and appropriating classes under capitalist social-property relations. This qualitative difference between market as an opportunity and market as an imperative underlines the qualitative distinction between pre-capitalist and capitalist markets and implies a qualitative differentiation between social-property relations that are not capitalist, and those that are.

This does not mean that trade, commerce, and the spread of markets were insignificant in the emergence of capitalism. It rather means that the way in which early modern changes in commerce, industry and population were mediated by the specificity of English agrarian class relations gave rise to a qualitatively different socio-economic logic in England in contrast to other specific trajectories of development in continental Europe. As Zmolek points out:

> The rise of trade in early modern Europe is indeed a contributing factor, and there could have been no capitalism without it. But all other factors being equal, it is the peculiarity of English class relations which set the English economy on a new path, whereby changes in commerce, industry and population yielded completely different results in England than on the Continent.[155]

From such a perspective, it becomes possible to distinguish between 'capitalism' and 'commerce': 'the critical factor in the divergence of capitalism from all other forms of "commercial society" was the development of certain social-property relations that generated market imperatives and capitalist "laws of motion", which imposed themselves on production'.[156]

Capitalist social-property relations display a specific form of surplus appropriation, namely the historically specific 'economic' form through which surplus labour is pumped out from the producers by the appropriating class. This specific form of surplus labour transfer, related to the commodification of human labour, historically gave rise to the 'pressures of competitive production and profit-maximization, the compulsion to reinvest surpluses, and the

154 E. Wood 2003, p. 56.

155 Zmolek 2000, p. 145.

156 E. Wood 2002a, pp. 75–6.

relentless need to improve labour-productivity',[157] on the part of appropriators. Contrastingly, one does not observe this relentless drive to reinvest surpluses in agriculture or industry in the practices of medieval lords and/or merchants: 'they were little interested in productive investment, whether in agriculture or industry'.[158] The producing classes, for their part, are compelled to enter the market in order to have access to the means of production and their means of subsistence, while pre-capitalist market opportunity did not entail such compulsions in a context where producers had 'un-marketised' access to both means of production and means of subsistence. In a word: in capitalism, the social reproduction of both producing and appropriating classes is mediated by market imperatives. This form of surplus appropriation, these pressures coming from market imperatives, and the separation of direct producers from their means of subsistence and the means of production, are specific features of capitalism.

Capitalist social-property relations emerge in England in relation to the process of consolidation of holdings by landlords. This process of consolidation was, among other things, inscribed in the lords' strategies for the reproduction of their social power as a means to prevent the spread of free-holding. Landlords, then, leased those holdings to farmer-tenants, who farmed them by hiring wage-labourers. The development of a market in leases is a crucial component of this process, as tenants and landlords relied increasingly on the market to fix the price of leases. Such developments were made possible because farms, in various parts of England, became 'separated out of the system of collective regulation, and common rights and obligations, that characterized the medieval peasant agricultural community'.[159] The roots of this divergent development can indeed be traced back to the differentiated form of feudal social relations in England, especially the absence of *seigneurie banale*, which played a crucial role in French feudal relations. As Comninel summarises,

> The effects flowing from this initial basic difference in feudal relations include: the unique differentiation of freehold and customary tenures among English peasants, in contrast to the survival of allodial land alongside *censive* tenures of France; the unique development of English common law, rooted in the land, in contrast to the Continental revival of Roman law, based on trade; the unique commoner status of English manorial lords, in contrast to the Continental nobility; and, most

157 E. Wood 2002a, p. 76.

158 Hilton 1985b, p. 4.

159 Comninel 2000, p. 32.

> dramatically, in the unique enclosure movement by which England ceased to be a peasant society – ceased even to have peasants – before the advent of industrial capitalism, in stark contrast with other European societies.[160]

This architecture of social-property relations developing in the English countryside from the late fifteenth century onwards led to 'rules of reproduction', which generated an interest for both landlords and tenants to improve the productivity of the land. This 'mutual interest' is referred to by Brenner as a 'symbiosis', 'the displacement of the traditionally antagonistic relationship in which landlord squeezing undermined tenant initiative, by an emergent landlord/tenant symbiosis which brought mutual co-operation in investment and improvement'.[161] Comninel speaks on his part of 'mutual benefit':

> Together, these landlords and tenants (with the latter providing at least a substantial amount of operating capital) restructured agrarian production for their mutual benefit. Above all this meant, through one or another form of enclosure, either escaping from, or extinguishing, the normative regulation of land use by the customary peasant community.[162]

This shared interest led to productive investments of surplus in the organisation and techniques of production on the land, and to the resulting higher productivity that set the English agrarian economy apart from other continental European countries in this period, especially seen in the light of it remaining relatively impervious to the general crisis of the seventeenth century that struck the European Continent. Crucially, the advent of agrarian capitalism also put the control over production into the hands of capitalist tenants in a way that pre-capitalist wage-labour relations had not, prefiguring the full capitalist control over labour processes, and thus a crucial feature of temporal alienation in capitalist societies.

This brief examination of the transition period labelled 'agrarian capitalism' has identified basic features that are specific to capitalism. Particularly noteworthy are the specific economic form in which surplus is pumped out of the producers, the relentless drive to increase the productivity of labour and to develop productive forces, the imposition of market imperatives on the reproduction of the social position of both appropriating and producing classes, the

160 Comninel 2000, pp. 4–5.

161 Brenner 1985, pp. 46, 51.

162 Comninel 2000, p. 46.

process of dispossession of direct producers, and the signs of a passage of the control over production processes to the appropriating class.

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There is no doubt that the transition from feudalism to capitalism entails a series of changes in conceptions and practices of time. While clock-time unmistakably appears in various forms in English society during this period, it does not become the *hegemonic* social time in 'agrarian capitalist' social time relations, which remain closer to a hybrid form of the concrete processual temporality of agricultural life, only superficially and slowly supplemented by forms and practices of clock-time. As the open field system and its legal and customary encoding of the time of labour according to agrarian and seasonal cycles were brought to an end by processes of enclosures, clock-time did not fill the void in any sudden way whatsoever, and practices of concrete times were not subsumed under abstract time. However, although abstract clock-time does not become hegemonic in the period of agrarian capitalism, it does spread and proliferate, for instance, in the spheres of science and technology, as well as in some other social practices.[163] Let us explore this further.

3 The Clock-time Infrastructure

Despite the theoretical differences, Paul Glennie and Nigel Thrift's *Shaping the Day* offers empirical findings that are extremely valuable.[164] Indeed, their detailed and dedicated empirical research brings to light historical evidence about the spread of clock-time in England in the period of agrarian capitalism. Clock-time spread, in towns but also in rural settings, throughout the transitional phase of agrarian capitalism in England, without yet rising to a hegemonic position in these specific social time relations. Indeed, clock-time is not merely an urban phenomenon in early modern England, but can also be found in rural settings.[165] Even before the Industrial Revolution, clocks were found not only in urban centres, but also at 'the outer margins of anything we might call the English "urban system"'.[166] E.P. Thompson's research had led him to suggest that 'the majority of English parishes must have possessed church

163 Glennie and Thrift 2009.

164 Theoretical shortcomings in their work are addressed in Martineau 2015.

165 Glennie and Thrift 2009, p. 176.

166 Glennie and Thrift 2009, p. 147.

clocks by the end of the sixteenth century'.[167] Although historical evidence for such a claim to be made for the period before the 1630s might be sparse, some 'very small places maintained church clocks over long periods', and this is the case 'for both "town" and "rural" parishes'.[168] Clock-time was found even in remote rural areas, although it is difficult to assess to what extent it penetrated rural social life other than superficially, as spatio-aural limits probably limited the range of a church clock in a rural context.

Glennie and Thrift summarise their empirical findings in the frame of what they call three interrelated revolutions. While the theoretical commitments modelling their reading of the data can be problematised, their findings remain of the utmost importance. The first revolution relates to how, in the fifteenth and sixteenth centuries, 'clock-times enter and pervade everyday life as mechanical clocks provide a critical impetus to standardized equal-hours timekeeping, first as a complement to, and then as a replacement for, various earlier and looser frameworks of daily temporality'.[169] Crucially though, as I point out below, the qualitative difference between the *spread* of clock-times in everyday practices, and the *hegemony* of clock-time in capitalist social time relations should not be underestimated. Discussing the spread of public clocks in English towns from c.1400 to c.1600, Glennie and Thrift do acknowledge that although the use of clock-time begins to enter social and individual narratives that locate events according to clock-time-units such as equal hours, 'large towns were too thinly distributed for clock-times to *yet* become pervasive of everyday life'.[170] So, although the historical record shows that clock-time does spread in the social field for that period, especially in towns – and to some extent in rural regions, even though the historical evidence is too sparse to make any generalisation – clock-time does not yet acquire a hegemonic character.

The second revolution refers to the increased subdivision of hours into minutes and seconds; in other words, the spread, sophistication and 'miniaturisation' of clock-time-units, of clock timeframes. If in the 1550s a great amount of 'foraging behaviour' was required to 'find the time' to such levels of adequation, shortly before, during, and after the horological revolution catalysed in the innovation of the pendulum mechanism in the seventeenth century, finding and telling time to the minute or second became an easier task. What this shows is that the sophistication of an abstract clock-time system occurred

167 Thompson 1993, p. 361.

168 Glennie and Thrift 2009, pp. 151, 157.

169 Glennie and Thrift 2009, p. 409.

170 Ibid., my emphasis.

progressively throughout the period between the late sixteenth century and the early eighteenth century.[171]

The third revolution is located in the development of specialised communities, which centred on practices involving small and precise units of time. Glennie and Thrift often depict these communities, such as seafarers, clock-makers, astrologers and astronomers, and so on, as a sort of vanguard of clock-times – their class, racial or gender position, however, is not taken into account. But crucially, what this highlights is that specific social groups increasingly make use of clock-time and clock-time units, and as such clock-time increasingly becomes itself a formal system in which some specific social practices are inscribed.

As such, in the processes leading up to the Industrial Revolution, the *temporal infrastructure* of clock-time spreads out to a significant extent in English society, without yet penetrating social life in a systematic way.[172] Based on Glennie and Thrift's empirical findings, one finds that throughout the period of agrarian capitalism and capitalist development in England, clock-time (1) spreads geographically, (2) undergoes a process of sophistication, and (3) increasingly becomes a formal system in which certain practices are inscribed. The question then arises: under what circumstances does clock-time acquire its *hegemonic* character?

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From all this it is clear that clock-time is not a creation of capitalism. The innovation of clocks and clock-time was embedded in pre-capitalist social-property relations. Throughout the transitional period of agrarian capitalism, clock-time spreads to the social field en route to forming a *temporal infrastructure*. However, the capitalist law of value is hardly operative in the historical period of agrarian capitalism in England, and much less in the rest of Western Europe. Accordingly, although it is crucial to understand the agrarian origins

171 Although it is important to note that the form of clock-time opens the door for the construction of smaller and more precise units, it should not go unnoticed that very short time units are not a product of Western clock-time 'precision', and that several cultures over the world have produced extremely short time-units. One only need look at the Buddhist 'knasa', which approximately lasts for one seventy-fifth of a second, or 'one ninetieth of a thought'.

172 E.P. Thompson might then have underestimated the spread of clock-time in the social field prior to the Industrial Revolution. However, his fundamental insight, namely that capitalism revolutionises social time, is still very much valid, as discussed below.

of capitalism in order to identify its specificities as a social system, as a 'mode of production', it would be historically and theoretically hazardous to look for 'pure' capitalist temporal practices in agrarian capitalism *per se*, since capitalist time is shaped by processes of value formation as they occur in fully fledged capitalist societies. What agrarian capitalism historically brings about is the qualitative transformation towards capitalist social-property relations, which sets the stage for the development of historically specific forms of – capitalist – value formation and appropriation. English society in this period concomitantly undergoes a process in which a clock-time infrastructure is formed.

What remains to be examined is the historical fusion between clock-time and processes of capitalist value formation, and its consequences for capitalist social time relations. How are the empires of value and clock-time related? I explain below how it is under fully-fledged capitalist social relations that clock-time will acquire its hegemonic status, because of its fundamental relationship to processes of value formation. Indeed, the recuperation of this clock-time infrastructure by capitalism, its subsumption to the extent that abstract clock-time units become embedded in the formation and appropriation of value, constitutes the true 'Revolution of the clock'. Capitalism will universalise this clock-time infrastructure and make it into the hegemonic form of time and temporality in capitalist societies.

England will form a privileged setting to enquire into, since it is the first capitalist country. Western European countries and the United States will also be integrated in the narrative at various times, since their capitalist development will lead to the global spread of capitalism and clock-time. However, the advent of capitalist social-property relations in every setting is specific. England's capitalist development is endogenous, while most other countries develop capitalist social relations 'from above', as it were, either through state apparatuses under the geopolitical pressure of England, or through ruthless colonialism, imperialism, dependency or military pressure. The historical spread of capitalism has been accompanied by the spread of clock-time.[173] Clock-time has been culturally and socially embedded in idiosyncratic ways all over the world; different cultures have different attitudes to it, and the level to which clock-time has been integrated by peoples and societies varies. Capitalist social time as a 'struggling entity', comprising hegemonic abstract time in a relation of power towards various forms of concrete social times, is a constant in capitalist societies, while the specific resulting social time relations, their institutional forms, the degree of hierarchical relations between abstract and concrete times, the

173 Adam 2004, p. 136.

specific way in which times interpenetrate each other, and so on, remains historically and socially specific.

4 Newton's Time

It is in this context of the emergence of capitalist social-property relations and the process of formation of a temporal infrastructure of clock-time in England that Isaac Newton's theory of 'absolute time', arguably one of the most influential conceptions of time ever formulated, is situated. This idea of 'absolute time' was exposed in his *Principia*. What follows does not posit that physics, or science, should be simplistically reduced to a reflection of the social, or that scientific developments can be merely deduced from socio-historical developments. At the same time, however, although forms of knowledge do display endogenous forces and logics of development, they do not develop outside of society, or cut off from the rest of human life. The case of Newton's concept of time illustrates the important relationship between his ideas and the material and temporal realities in which they were formulated.

Newton's powerful and influential conception of time expresses social changes brought about by the spread of clock-time and the emergence of agrarian capitalism, and even prefigures the development of capitalist social time relations. Part of Newton's prescient genius might be related to the fact that he is part of the specific social microcosm (the learned community of physics and astronomy/astrology) in which clock-time conceptions and practices are the most widespread. Moreover, his differential definition of 'absolute' and 'relative' time, and the supremacy of the former over the latter, can be read in relationship to the growing presence of abstract clock-time and as an insightful prefiguration of the direction that the relationship between abstract clock-time and concrete social times will take in Newton's context and beyond.

Newton's conception of absolute time makes it an *independent* variable with respect to which things move, i.e. change their positions in space (motion). Such a conception of time as an independent variable can be read against the background of the spread of abstract clock-time, which itself produces time as an independent variable. Clock-time had become more precise than ever before in Newton's context. In technical terms, the 'invention'[174] of the pendulum by Huygens in 1656 had taken abstract clock-time to a whole new level

174 Huygens developed and corrected an idea put forward by Galileo a few years earlier. He was accused of plagiarising in his time (see Landes 1983, p. 116).

of precision, and had radicalised its 'abstract', 'empty' and 'constant' character. It had also spread to the social field very rapidly: several parish church clocks were displaying such mechanisms a mere 20 years after its first use.[175] The mathematical abstraction and the precision of post-pendulum clock-time divorced it even more from events and concrete socio-material temporalities.[176]

From a theoretical perspective, Newton's development of the concept of absolute time is to be understood with regard to his attempts at defining 'true' motion. Indeed, Newtonian mechanics are first and foremost a discussion of 'laws of motion'. Newton's mathematical theory of motion evolves in a framework characterised by absolute space and absolute time. First, in terms of space, Newton posited that the only feasible analysis of 'true absolute' motion required reference to absolute places. Such absolute space required that Newton go against the views of Descartes and Leibniz, for whom 'empty space' was a conceptual inconsistency, or in other words, that space distinct from body could not exist. In fact, absolute space was not at all seen as an innovation in Newton's own time.[177] Most of the other participants in this period of the development of European physics saw it as a regression,[178] and, as Penrose points out, Galileo's innovations and theories, especially the principle of relativity, had disproved the absoluteness of space prior to Newton's interventions.

In order to grasp why Galileo had rejected absolute space, let us imagine a point in space, point *p*, and let us say for the sake of this example that point *p* is occupied by a given object: the London Bridge. In terms of spatial coordinates, we would identify its position at any given point in time. Given that the bridge hardly 'moves', we would consider, in terms of absolute space, that our point *p* is stationary. But even though the bridge is stationary, does it make any sense to say that it occupies the same point in space from one point in time to the next? If one follows the principle of relativity, the answer is no, since Galileo has shown that dynamical laws are precisely the same when referring to any frame which is moving uniformly: the physics of stationarity are indistinguishable from the physics of uniform motion. In other words, there is no way of knowing whether an observed phenomenon is occuring in a stationary frame, or in a uniformly moving one, since the dynamics of both frames are indistinguishable. To paraphrase Galileo's example: flies flying around on a moving ship fly indifferently to each and every side, the flies will not concentrate toward the stern, and will not produce any special effort in order to 'keep up'

175 Glennie and Thrift 2009, p. 161.

176 On the pendulum, see Landes 1983, pp. 116–19.

177 In what follows I rely on Penrose 2004.

178 Disalle 2006, pp. 13–14.

with the ship's speed. This blindness of the laws of physics to the distinction between stationarity and uniform motion is called the principle of relativity. It is this principle that makes it meaningless, dynamically speaking, to say that the London Bridge occupies the same point in space from one moment in time to the next.

In order to illustrate this further, let me use Roger Penrose's dizzying example[179] and apply it to the spatial point occupied by the bridge. Paraphrasing him, we could start by considering the point *p* occupied by the bridge in light of the Earth's rotation, and note that the point in space *p* occupied by the bridge right now will be some 16km away a minute later. To push this logic, we could then take into account the Earth's motion about the sun. If 'now' is a little after midday, the Bridge would then be 160km off, but in the opposite direction, beyond Earth's atmosphere. Next, we could consider the sun's motion about the centre of our galaxy, the motion of the galaxy itself within the local group, the motion of the local group about the centre of the Virgo cluster, the motion of the Virgo cluster in relation to the vast Coma supercluster, and finally the motion of the Coma cluster towards the 'Great Attractor', the centre of the universe. The London Bridge, from this perspective, would have moved quite a bit, to say the least. To the extent that, as Galileo has shown, there is no distinction in physical laws between stationarity and uniform motion, there is also 'no meaning to be attached to the notion that any particular point in space a minute from now is to be judged as the same point in space as the one that I have chosen'.[180] In a Galilean relativistic framework, absolute space has no meaning: space coordinates evaporate and reappear at every passing second.

This is why Newton's notion of absolute space was seen as a regression in his own time.[181] Why then did he push it forward, as well as a notion of absolute time, especially given that Newton was himself, initially, a Galilean relativist? The answer from a theoretical point of view is that in order to make his dynamical laws work, Newton needed to postulate absolute space and time.

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179 Penrose 2004, pp. 386–7.

180 Penrose 2004, p. 387.

181 One interesting feature of the notion of absolute space in Newton's *Principia* is that it reveals the deistic commitments of its author. Not only was Newton a fervent deist, but God, in his mechanics, is the ultimate cause of motion. His notion of absolute space, by permitting empty space, was characterised by himself as the *sensorium* of God, as the following passage of his *Opticks* reveals: 'does it not appear from Phenomena that there is a Being incorporeal, living, intelligent, omnipresent, who in infinite Space, as it were his Sensory, sees the things themselves intimately, and thoroughly perceives them, and comprehends them wholly by their immediate presence to himself' (Newton 2003, p. 370).

It is thus seen, in the literature, mostly as a logical necessity.[182] Let me now return more specifically to Newton's conception of time and see if one can gain some insights from a socio-historical reading, rather than from a perspective assessing purely logical and theoretical necessities.

In the *Scholium*, Newton distinguishes between two different times: relative time and absolute time. Relative time, on the one hand, is conceived of as relating to a sensible body, object, or event. According to a relativist view, time stems from the motion of objects, from changes in the world. Related as it is to objects and events, relative time is thus a dependent variable. Newton wants to distinguish this 'relative' time from the 'true', 'absolute', mathematical quantity: absolute time. Therefore, absolute, true, and mathematical time flows equally without relation to anything external, and thus without reference to any change, object, event, or way of measuring of time (e.g. the hour, day, month, or year). In Newton's own words,

> Absolute, true, and mathematical time, of itself, and from its own nature flows equably without regard to anything external, and by another name is called duration: relative, apparent, and common time, is some sensible and external (whether accurate or unequable) measure of duration by the means of motion, which is commonly used instead of true time; such as an hour, a day, a month, a year.[183]

Newton's reasoning followed from the recognition that in his quest for uniform mathematical quantities, those 'common' or 'vulgar' measures associated with relative times were not adequate. For instance, the solar day, defined as the time-extension it takes for the sun to return to zenith, varies by as much as 20 minutes over the course of a year. Newton's argument is straightforward: since relative time is measured by a standard of motion (earth, sun, moon, sand, etc.), it can never be trusted to be absolutely uniform, since any motion can be slowed down or accelerated by the appliance of an external force. Absolute time, in contrast to relative time predicated on motion, flows uniformly.[184]

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182 The argument has been made numerous times in the literature that absolute time, notwithstanding if we see it as a metaphysical statement, a hypothesis or a working definition, was a necessity, either logical or practical, for the pursuit of empirical physics to 'work'. See, for example, DiSalle 2006 and Penrose 2004, p. 388.

183 Newton 2010, p. 13.

184 The idea that time is distinct from any measure of it was already propagated in Newton's epoch. Indeed, he must have read it as an undergraduate in Charleton's *Physiologia*,

The distinction here is thus between time as a 'true' quantity, an independent variable, and time as a relative 'vulgar' measure, a dependent variable. Although the categorisation of Newton's conception of time as substantivalist might have its shortcomings, it is still helpful to make sense of 'absolute time' in the light of the substantivalist vs. relational debate. On the one hand, relationalists, such as Leibniz, argue that time is a way to compare one event to another. Time is not independent of the material objects in the world: the material objects and their motion are precisely what define time. From a relationalist point of view, if there is no motion, there is no time. On the other hand, Newton posits the substantivalist idea of absolute time as independent of all motion: it is simply 'there', as a necessary structure of nature, an entity in its own right. Absolute time entails the existence of an entity distinct from the succession of particular events in which the events are located. The distinction between absolute and relative time is straightforwardly an ontological distinction. There is something 'outside of' or 'beyond' relative time that flows independently of any event.

Newton thus presented absolute time not only as a pure mathematical quantity, but also as the *true* quantity. One could say, following Husserl's famous diagnosis in his *The Crisis of the European Sciences*, that a purely methodological necessity has come to replace true being. Indeed, Newton's method here substitutes symbolic mathematical abstractions for intuitional concrete physical temporal realities. The means through which the world is represented is mistaken for the world itself. We could thus apply Husserl's general criticism to Newton's 'mathematicization' of physics in seeing that it also was a 'mathematicization' of the world:

> Mathematics and mathematical science, as a garb of ideas, or the garb of symbols of the symbolic mathematical theories, encompasses everything which, for scientists and the educated generally, *represents* the life-world, *dresses it up* as 'objectively actual and true' nature. It is through the garb of ideas that we take for *true being* what is actually a *method*.[185]

Indeed, Husserl points the right way. Newton's absolute time is not only put over and beyond any sensible body or phenomenon, but it is also, crucially, placed out of the reach of humans. Humans merely approximate absolute time, although when considering Huygens's pendulum, Newton found it a

published in 1654, alongside many other ideas that would become central to his physics (see Rynasiewicz 1995).

185 Husserl 1970, p. 51, Husserl's emphasis.

decent approximation of absolute time, suggesting that the level of abstraction reached by clock-time in this context had already made this human-made time-form paradoxically appear detached from human relative measures and human relative time. With Newton, the 'absolutism' of abstract time is given a strong impulse. It is ascribed full authority, it answers to no 'relative' or 'common' notion of it, it is completely independent of events, objects and the environment. Moreover, it cannot be changed, it cannot be challenged, it is out of the reach of any human or social force. Newton installed an absolute entity, a time independent of human timing practices and relative – or concrete – times. He substituted an abstraction to the social being of time. He postulated a time whose parts are ordered in an 'immutable' way, a time '*in*' which 'all things are placed'.[186] The social basis of time is here deemed 'relative', whereas 'true' time is independent of humans, it is absolute, objective, 'natural'.

It is possible to read Newton's conception of time against the background of the transition to capitalism and the relative spread of clock-time in some conceptions and practices, especially in Newton's learned scientific community. Newton's theory indeed expresses this development and even prefigures absolute time as 'independent and uniform', thereby expressing the 'independent and uniform' form taken by abstract clock-time in capitalist social time relations. Social processes occurring at the historical juncture at which Newton's theory was formulated can be seen as a relevant background to it.

A similar argument in the case of Newton has been made by historian of science Boris Hessen. Its main points are worth examining. Methodologically, Hessen relates the technical problems posed by developments in the spheres of communication, industry and war, with the complex of problems and knowledge addressed by physics in this period. For example, the heightened construction of mines demanded refined notions of geometry and trigonometry, the development of firearms posed problems of physics related to the resistance of different materials, to the trajectory of projectiles, and so forth. Hessen's point is that technical tasks raise problems for physics, and that the development of science should not be seen in total isolation from social development.[187]

For this particular period, Hessen argues that the problems related to the socio-economic context are overwhelmingly problems of *mechanics*. He shows

186 Newton 1995, pp. 15–16, my emphasis.

187 Scientists are historical creatures of this world. Galileo begins his *Mathematical Demonstrations* by pointing out that the arsenal at Venice provides 'a wealth of material for scientific study'. Elias notes too that 'One of the practical problems that interested Galileo was that of the functioning of weapons such as cannons' (Elias 1992, p. 112).

that the major problems of physics in this period – that is, (1) the problem of simple machines, inclined planes and general problems of statics, (2) the free fall of bodies and the trajectory of a projectile, (3) the laws of hydro- and aerostatics, and atmospheric pressure, the pump, the motion of bodies through a resistant medium, and (4) the problems of celestial mechanics and the theory of tides – all correspond, to a striking extent, to the technical demands made by the development of industry, communications and war – namely (1) mining and building, (2) artillery and ballistics, (3) the drainage and ventilation of mines, the smelting of ore, canals and lock construction, intrinsic ballistics and designing the shape of ships, and (4) navigation. For Hessen, it is beyond doubt that the topics and problems of physics thus seem to have been those placed on the agenda by what he calls 'the rising bourgeoisie'. For him, the dazzling flourishing of natural science during the sixteenth and seventeenth centuries resulted from the disintegration of the feudal economy, the development of merchant capital, of international maritime relations and of heavy (mining and metallurgical) industry (for war). Hessen then spends time on Newton's theories *per se*, and shows how Newton's interests were precisely 'terrestrial', referencing his letters to friends and episodes from his career at the Royal Mint. The *Principia* itself can be read as a series of solutions to these problems. In Hessen's words, 'despite the abstract mathematical character of exposition adopted in the *Principia*, not only was Newton by no means a learned scholastic divorced from life, but he firmly stood at the centre of the physical and technical problems and interests of his time'.[188]

The technological and social problems raised by Hessen no doubt form part of Newton's context and can provide a historically informed lens through which one can appreciate the great English thinker's contribution to Western science. In this sense, Newton's scientific mind is related to the socio-historical context of the emergence of capitalist social relations in the English countryside and the progressive marketisation of social relations in England and in other parts of Europe. Newton is living, thinking and writing in the context of a rising English capitalism, and of the rise of the social power of English capitalist 'improvers'. However, the argument here is a lot less grandiose than Hessen's. Of interest here is specifically the relationship between Newton's conception of time and the conceptions and practices of time in his context. As such, I suggest that with regard to time *per se*, Newton offers one of the clearest expressions of the rise of abstract clock-time as a conception and practice of time. Clock-time, refined with the sophistication of the pendulum and spreading in this period to parts of English society, especially learned

188 Hessen 2009, p. 17.

communities such as the one in which Newton's scientific interventions occur, finds a cogent theoretical elaboration in Newton, which counterposes absolute time to 'vulgar' social times, thus prefiguring the trajectory that the struggle between abstract and concrete times in capitalism will take.

If one looks at Newton's context, then, one sees the emergence of conceptions and practices of time that underlie his own theory of time. The rise of practices predicated on and reproducing independent, abstract time, the formation of a clock-time infrastructure, occurs historically in parallel to the emergence and progressive ascension to dominance of a social relation of wage-labour, of the emergence of a class of labourers forced to sell its labour power as a commodity on the market, and the growing market dependence of both producers and appropriators.

5 Remarks on Pre-capitalist Social Time Relations

Before moving on to a more in depth assessment of the interaction between capitalism and time in the next chapter, some synthetic remarks about pre-capitalist social time relations in Europe can be made. On the question of the alienation of time, there were instances in feudal societies in which the time of labouring practices could appear as having been, to some extent, alienated. For instance, one could argue that the labour performed by monks in monasteries, which formed not only religious communities, but also labouring enterprises, was alienated time. The social time relations presiding over such a process, though, in that instance, were of a different kind. The appropriator was the community, in the form of the monasteries themselves, or the Church in general. In this sense, we can say that the time of labouring practices of monks belonged to the 'community', while appearing to the agents as God's time. But it is important to point out here that the time of labour *per se* is not alienated in this context. Although work is performed alongside a temporal order characterised by time-discipline, there is no fusion between appropriation and time: surplus transfer from producers to appropriators is not predicated on abstract time measures. As such, it appears that temporal domination does not necessarily entail temporal alienation in this context. The same could be said of the legal codification of the time of labours by manorial courts in the open field system.

A second example is wage-labour in European urban manufacturing centres. What Le Goff has called the 'new time' was dominated time, as seen from the fact that this time was regulated in order to be subjected to the realm of commercial practices. It is no accident that the first social usages of

clocks were made in a labouring context. In fact, to use Thompson's words, the 'employment of actual hands' in productive practices marks a crucial leap in the emergence of the temporal alienation of labouring practices. But crucially in the pre-capitalist context, the labour process itself is not under the control of employers and appropriators. Workers and producers remain masters of the concrete times involved in their labouring activities, times of labour whose texture, fabric and knowledge had been handed down by tradition. Although the timing of the duration of work by clock-time entails a particularly strong and brutal form of temporal *domination*, temporal *alienation* is not systematically or completely occurring. The mitigated aspect here rests on the fact that abstract clock-time units envelop and *dominate* the duration of labour, but do not *alienate* the concrete times of the labour process – more on this below.

To use Le Goff's categories once again, Church time and merchant time did then display characteristics of temporal domination. These modes of temporality tended to construct official time as something that did not directly belong to labouring or devout people, whether time was conceived of and practised as belonging to God, to employers, or to the logic of commercial markets. However, this form of temporal domination did not penetrate and alienate the very fabric of concrete temporalities involved in productive practices. So, one does see in feudal societies that people were subjected to temporal domination, but it is difficult to speak of truly fully-fledged temporal alienation as a fundamental feature of these societies. The enquiry into popular cultural forms of temporality and into the time of the bulk of European feudal labouring practices has shown that popular times and the times of labour on the land were not alienated.

It might be tempting here to argue that the time of labouring practices was alienated in feudal social time relations since labour was alienated, but that would amount to taking an ill-advised shortcut. For instance, it might be argued that the time 'spent' labouring for the lord was alienated time. From that perspective, the time dedicated to the production of the surplus that would be appropriated, or for that matter practices such as the *corvées*, might be seen as instances of alienated time in feudal social time relations. This, however, would amount to projecting back onto feudal social labour the measuring rods of industrial capitalist labour. Indeed, 'labour' and 'time' are not fused in pre-capitalist societies in the same way that they are in capitalism. The 'time' with which we would measure feudal labour is rather a form of alienated time belonging to capitalist social-property relations. Capitalist value, with its corresponding labour-time as a formative unit, did not prevail in pre-capitalist societies. Accordingly, it would be chronocentric to consider feudal social time relations in the light of capitalist social time relations.

It appears therefore that the time of the peasants and popular masses, 'processual concrete time', was not alienated time. Although there is no doubt that *labour* was alienated, it is not at all clear that the *time* of labouring practices was also alienated. On the one hand, pre-capitalist labouring practices were not emptied of social interaction, of what is called today 'leisure-time', with concrete contents of community, family and friendly interactions and activities including napping, resting, drinking, story telling, and so on. On the other hand, and relatedly, the labour process itself was not controlled by the appropriators. Having access to their means of production, the peasants of medieval Europe were not exploited by purely 'economic' means, but rather by an apparatus of military, political, legal or religious means. The appropriation occurred, so to speak, *after* the fact, *after* the actual production of the surplus. The *moment of appropriation* did not correspond to the *moment of production*, appropriation was not 'economic' as it would become under capitalism. The actual production process, and the time of the labouring practices itself remained, to a significant degree, a peasant, or craftsman's matter.[189] The labour process was predicated along the lines of a concrete time of tasks and of socially mediated processes of nature, as expressed, for example, in the cultural forms of grotesque realism. This does not mean that labour itself was not alienated: it was. But labour and alienated time were not *fused*, as they were about to become under capitalism.

One good way to illustrate the difference between feudal time and capitalist time is to take into consideration the time of the transitional phase: agrarian capitalism. Agrarian capitalism, as a transitional phase between feudalism and capitalism, did not respond to the same temporality criteria as industrial capitalism, a fully-fledged form of capitalism.[190] Agrarian capitalism's temporality, as far as the historical record allows us to conjecture, functioned in a way that was still very much closer to processual concrete time.[191] The key

189 Hilton 1985b; Rifkin 1987, pp. 104–5.

190 Although we should note, in the ideology of 'improvement', which is a social product of agrarian capitalism, that the idea of 'productivity', of getting more output in less time and space, is already at work, prefiguring the ideology of making labour more 'productive', which is tied to temporal alienation under capitalism.

191 This is not intended to reproduce the distinction between an 'archaic' relationship to time in pre-capitalist societies, which would be more 'natural' than modern or capitalist time. The relationship to time of some 'archaic cultures' was, on many levels, richer, more complex and sophisticated than the capitalist one. The relationship to nature is always socially mediated, and a tuning to seasons does not mean a less sophisticated relationship to time than the suppression of seasonal temporality by practices such as heating, air conditioning, genetic engineering of plants, and so on. 'Closer to processual concrete

difference introduced by agrarian capitalism was the 'freeing' of the worker from her/his means of reproduction, forcing her/him to sell her/his labour power on a labour market, and the fact that tenant farmers increasingly took control over production. Such processes did emerge in agrarian capitalism, and would later become central ways in which social labour would be structured under industrial capitalism. This change in social relations would open the door for increasingly direct control of the labour process by the class of appropriators, which would culminate in industrial capitalism, lest we only mention capitalist forms of labour process control such as Fordism or Taylorism (more on that below). The alienation and reification of temporalities would then unfold with industrialisation, as capitalist value, mechanisation, the technical division of labour, labour management and discipline by employers, and the production of surplus value, would become the driving forces of capitalist society. To make the hypothesis clear: while agrarian capitalism is the transitional phase between feudal and capitalist social relations, the spread of clock-time in medieval and early modern Europe, and more specifically in England, is the transitional phase which will lead to the fusion between alienated labour and abstract time; it is the transitional phase in which the temporal infrastructure of alienated capitalist time is laid down. Capitalist value takes hold of clock-time's infrastructure when capitalist social relations become dominant.

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time' here, then, simply means that the seasonal cycles are socially relevant to labouring practices, not that the relationship to time in the agrarian capitalist social setting was less sophisticated, 'profound', or 'rational'. The temporal practices involved in agriculture are not 'natural'; rather 'agriculture' as we know it is the result of thousands of years of practices of domestication, breeding, and continuous and discontinuous sophistications of agrarian practices embedded in social relations.

CHAPTER 3

Capitalist Social Time Relations

Time is everything, man is nothing.[1]

1 Clock-time in the Capitalist Context

Historicising clock-time reveals it as a form of social time that originates from specific socio-historical settings and practices related to medieval commodity production, commercial activities, and pre-capitalist wage-labour. The origins of capitalism, for their part, are to be found in the transition period of agrarian capitalism in early modern England. In the case of England, the process of transition from feudalism to capitalism is contemporary to the laying down of a clock-time infrastructure.

What follows is an examination of the historical and theoretical relationship between capitalist social relations and clock-time. The link between capitalism and clock-time is often discussed in the literature, but it is not often thoroughly investigated. Adam, for example, discusses this relationship in terms of industry's 'dependence' on clock-time:

> Despite their diversity, all industrial time practices depend on time first being created to human design, that is, as abstract decontextualized and quantifiable clock-time. Built on the foundations of clock-time a time economy could flourish and the connection between time and money be established. Time could become commodified, compressed and controlled. These economic practices could then be globalised and imposed as the norm the world over.[2]

Although Adam notes the commodification of 'industrial time', she does not locate it in the very process of value formation, in the historical relationship between clock-time and capitalist value that ties labour and abstract clock-time together in such an inextricable way.

As Postone puts it, 'the "progress" of abstract time as a dominant form of time is closely tied to the "progress" of capitalism as a form of life'.[3] While

1 Marx 2009, p. 26.

2 Adam 2004, p. 73.

3 Postone 1993, p. 213.

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the origins of clock-time are situated in practices inscribed in pre-capitalist social time relations, the focus is now turned to the process of fusion between clock-time and capitalist social relations. Capitalist practices of value formation and appropriation display a tendency to alienate and subsume the concrete temporalities of material and human (re)productive practices under one hegemonic form, abstract clock-time. This tendency has been accompanied by the temporal alienation of a number of practices other than labour-time itself, to varying degrees. Capital tends to absorb concrete social temporalities into abstract clock-time, as it seeks to integrate them into its logic of valorisation. It succeeds to varying degrees, but never completely, as time in capitalism entails a logic of power and resistance, and alienating tendencies are contested. Nevertheless, capitalist social time relations are characterised by hegemonic alienated and reified time-forms.

Clock-time has become the hegemonic form of social time not only in the West, but also, through colonialism, imperialism, and various forms of influence, in other parts of the world. In fact, the diffusion of Western clock-time is not a mere collateral effect of Western expansionism, but has been in itself an efficient means of cultural and economic domination. As Adam puts it, 'time has been a most effective colonizing tool'.[4] The formation of the 'empire of capital'[5] has been supplemented by an 'empire of clock-time'.[6] In such an empire, domination and resistance often take the form of temporal struggles between abstract and concrete time.

The narrative of time-discipline in industrial capitalism has been mobilised numerous times already, and by astute and talented writers.[7] The consequences of clock-time in terms of 'time-discipline' *per se* have been the object of insightful research, and now the functional relationship between capitalism and abstract time has received increasing attention.[8] Here the aspect of the disciplinary character of clock-time in factory and social life is explored, but

4 Adam 2004, pp. 136–7. While many contributions in the literature treat the imposition of clock-time on non-Western societies as a result of colonialism and imperialism, there are also specificities and idiosyncrasies in these general processes that should not be overlooked. The best example of such specificities is the case of Japan under the Meiji government, which 'adopts' clock-time without being subject to direct colonial rule, and while feeling the pressures of imperialism in a different way than other non-Western countries (see Nishimoto 1997, pp. 237–59).

5 E. Wood 2005.

6 Hassan 2009.

7 For example, Thompson 1993 and Rifkin 1987.

8 Postone's (1993) work has cleared a lot of ground in that regard. As mentioned earlier, recent studies of time, such as Jameson (2009), Tomba (2013), Fischbach (2011) and Tombazos (2013)

not at the expense of an analysis of the specific relationship between capitalism and clock-time at the level of capitalist processes of valorisation and appropriation, and an account of the rise to hegemony of a specific form of social time that will come to dominate the multiple times which make up society's temporal fabric.

In order to go forward with these discussions, some refinements are needed on the meaning of 'clock-time' in the capitalist context. As seen in the previous chapter, clock-time is not a creation of capitalism. Furthermore, Glennie and Thrift's empirical findings show that a clock-time infrastructure seems to have been relatively widespread in England contemporaneously to the transition from feudalism to capitalism. Before the fully fledged development of the law of value, however, clock-time spread in social time relations without reaching a hegemonic position. Therefore, the enquiry here is concerned with the merging of the clock-time infrastructure and capitalist social relations, which has propelled clock-time to a *hegemonic* position amongst time-forms in capitalist social time relations.

Although 'clock-time' technically refers to the abstract sequence of constant, equal and 'empty' time-units such as equal hours, minutes and seconds as measured by clocks, it is operational in modern society in the context of its institutionalisation, together with the Gregorian calendar, at the basis of the modern social time regime. 'Clock-time' is therefore to be understood in what follows not only as 'the-time-of-mechanical-clocks', but as a cluster of complementary time-reckoning systems including the Gregorian calendar and the further division of the day into hours, minutes, seconds, and fractions of a second, culminating in the institutionalisation of a social time regime that reproduces abstract time units.

There are important socio-political aspects to the formal properties of the clock-time cluster. For example, the very notion of an 'era' involves a fixed starting time-point, what Ricoeur analyses as '*le moment axial*',[9] which seeks to fix a certain narrative – about creation, or bringing-into-the world of something 'new', or any culturally meaningful event – and the people who produce and use it, in a dominant position. As Jack Goody points out, it seems likely that this form of time-reckoning is a product of the advent of writing. Concepts such as 'century' and 'millennium' are products of literate cultures, and the numeral reckoning of the passing of years seems to have been absent from oral

offer perceptive contributions to the understanding of capitalist time. These are a welcome and important development.

9 Literally 'the axial moment' (Ricoeur 1985, p. 196). Jameson says 'axial event' (2009, p. 523).

cultures.[10] The Christian era itself can be seen as an imposition of the social and cultural power of the Church over time-reckoning practices in the Western world, and furthermore of Western-centred historical narratives on other parts of the world as this year-numbering system gained global reach.

Calendar time-reckoning has always been a tool of regulation of socio-economic life by states, religious elites, or dominant classes. Its divisions and categories of time attune natural cycles, productive activities and civil life. Calendar time-sequences and units are products of social interaction and conflict, and they institutionalise concepts and practices of time that often reflect a dominant group's prerogative to 'tell time'.[11] The civil month and the week, to take some prominent concepts and practices of calendar time, are more or less arbitrary constructions[12] – despite what Ricoeur calls their '*parenté explicite*'[13] with physical time. I have previously commented on the conventional aspects of time-units such as 'day' and 'second'. Goody provides a similar argument for calendar-time units such as the 'month', the 'week' and the 'year'.[14] It is worth quoting him at length:

> The year itself is a partly arbitrary division. We [in the West] use sidereal cycle, others a sequence of twelve lunar periods. It is a choice of a more or less conventional kind. In both systems, the beginning of the year, that is, the New Year, is quite arbitrary. There is, in fact, nothing more 'logical' about the sidereal year which Europeans use than about the lunar reckoning of Islamic and Buddhist countries. It is the same with the European division into months. The choice is between arbitrary years or arbitrary months. Our months have little to do with the moon, indeed the lunar months of Islam are definitely more 'logical'. There is a problem for every calendrical system of integrating star or seasonal years within lunar months. In Islam the year is adjusted to the months; in Christianity the reverse holds. In oral cultures both the seasonal count and the moon

10 Goody 2006, p. 14.

11 For accounts of calendar-time from a sociological perspective, see Adam 2004, pp. 103–12; Elias 1992, pp. 193–200; Zerubavel 1981 and 1985; Rifkin 1987, ch. 4; Hannah 2009; Aveni 2002. A very useful and detailed introductory summary is provided by Falk 2008, pp. 30–5. Here, a promising field of enquiry would look at the relationship between the advent of calendar time-forms and the systematic production of agricultural surpluses.

12 Goody 2006; Elias 1992.

13 '[E]xplicit kinship' (Ricoeur 1985, p. 194).

14 See also Hannah 2009.

> count can operate independently, but writing forces a kind of compromise. The week of seven days is the most arbitrary of all. In Africa one finds the equivalent of a 'week' of three, four, five or six days, with markets to correspond. In China it was ten.[15]

These forms of time-reckoning based on varying concepts and practices of 'day', 'week', 'month' and 'year' are a common feature of literate societies, in each of which specific dynamics of social power and social-property relations underlie specific calendar-forms.

The Gregorian calendar was introduced by Pope Gregory XIII in 1582, as a refinement of the Julian calendar previously in use. Despite its slow and uneven adoption throughout the world, it now tells official time around the globe. Adopted immediately by several Catholic countries, its further introduction in Protestant regions took more time. When adopted, it basically entailed a 'leap' of 10 to 14 days forward with respect to the Julian calendar. England did not adopt the Gregorian calendar until 1752, and consequently that year counted only 355 days. The second day of September was followed by the fourteenth, giving rise to the famous stories of 'calendar riots' in which people allegedly protested and demanded to have their 11 days back.[16] In many parts of the world, its adoption is even more recent: Russia did not adopt it until 1918, and Greece until 1923. In Asia, Japan adopted the calendar in 1872, and China in 1912. This calendar now works in synchronisation with the abstract time-units of clock-time as the official civil time-units worldwide. Further time conventions, such as the dating-system standard ISO 8601, participate in an official civil time-framework with worldwide validity. A conceptual distinction for the purpose of the remainder of the book is thus needed. Throughout what follows, 'abstract time' refers to the particular time-form of the mechanical time of the clocks, and 'clock-time' not only refers to the particular 'time of mechanical clocks', but more broadly to the interlocking of era-time and calendar-time with the time of the clocks into a worldwide time regime. The former refers to the formal properties of clock-time, the latter to its character as a social institution.

An insightful and influential writer on this topic, Eviatar Zerubavel, analyses the relationship between the Christian era, the Gregorian calendar and clock-time as a series of 'refinements' brought about by a need for social coordination:

15 Goody 2006, p. 15.

16 Whitrow 1987, p. 1.

> Compared with the Christian Era, the Gregorian calendar is a rather practical time-reckoning and dating framework, since it is sensitive to time intervals such as the month and the day, which the former is not. Yet for everyday temporal coordination in the modern world it is simply not sufficient. Social life as we know it would probably be impossible were we to rely entirely on time-units at least one day long when temporally coordinating ourselves with others. Making an appointment for 'February 16' is definitely more practical than making it for '1982', but it is still not sufficient. The indispensability of a standard temporal reference framework such as clock time, which involves such time-units as the hour, the minute, and the second, ought to be appreciated within this context. It is far more convenient to coordinate ourselves temporally with others through clock-time formulations such as 'at 4:55 P.M.' than through calendar-time formulations such as 'on April 27' alone.[17]

Although Zerubavel points in the right direction with his idea of 'coordination', it might be the case, however, that under capitalist social relations, clock-time coordinates not only 'people', but also commodities, and practices of formation and appropriation of value. In non-capitalist class societies, the formation of social wealth did not directly depend on a precise calculation of the temporal duration of expenditure of human labour, and appropriation did not depend primarily on 'economic' means. In capitalist societies, time-measurement of labouring practices in terms of abstract time-units becomes ingrained in the very processes of value formation, and appropriation occurs simultaneously to production through 'economic means', a practice of appropriation which might very well have to do with the time-compulsion brought about by clock-time relations at the point of production (more on this below). As such, when such a time-form comes to be so inextricably ingrained in processes of value formation and appropriation, it should not come as a surprise to witness the 'refinement' of temporal practices according to its divisions of the day and refined time-units.

This chapter first sheds light on the relationship between clock-time and capitalist value formation and appropriation. Second is an account of the emergence of World Standard Time as a product of the capitalist organisation of social time. Third, I discuss the alienation of time in capitalist societies, as well as the phenomenon of the reification of time. Fourth, I go on to analyse some temporal characteristics of domination and resistance under capitalism.

17 Zerubavel 1982, pp. 4–5.

2 Value Formation, Appropriation, and Abstract-time

In his analysis of the commodity at the beginning of *Capital*, Marx discusses its dual character. He distinguishes between the use-value and the exchange-value of a commodity, which in turn reveals the dual character of labour in capitalism: concrete and abstract labour.[18] Following the path opened by Moishe Postone, a further theoretical layer can be added to this narrative: the dual character of *time* in capitalism, or more precisely the relationship in capitalism between 'abstract' and 'concrete' time.[19] Postone uses the categories of abstract and concrete time in an insightful way, and some of what follows will build on this theoretical basis. His distinction between abstract and concrete time rests on their definition as independent and dependent variables, respectively. 'Abstract time', for Postone, is thus 'uniform, continuous, homogenous, "empty" time, [and] is independent of events', while concrete times are 'functions of events: they are referred to and understood through natural cycles and the periodicities of human life as well as particular tasks or processes'.[20] I shall use the terms 'abstract' and 'concrete' time in a similar way, and add some precisions along the way.

Postone's thesis suggests that capitalist time is characterised by a dynamic of 'transformation/reconstitution'. By that he means that the concrete time of use-value practices, re-termed by him 'historical time', presides over the historical movement of capitalist societies through the amassment of wealth, while the framework of value, predicated on abstract time, reconstitutes the very social relations which are formative of value, 're-*present*-ing', in a way, capitalism's abstract logic.[21] What follows refers to points made by Postone, but also keeps some distance from some of his propositions, in part following the general spirit of McNally's critique of *Time, Labor and Social Domination*.[22] I seek to highlight the processes of alienation, reification, domination and resistance at work between abstract and concrete time under capitalism, and to point to the historically specific characteristics of capitalist social time relations.

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18 Marx 1976.

19 For a thorough and illuminating reconstruction of the concept of time in Marx's analysis of the capitalist mode of production, see Stavros Tombazos's erudite contribution (Tombazos 2013). Here the focus is mainly on the question of abstract and concrete time.

20 Postone 1993, pp. 201–2.

21 Postone 1993, pp. 294–387. Fischbach broadly accepts this Postonian analysis, and adds that both of these times are inauthentic and alienated forms of historical time (Fischbach 2011, p. 110).

22 McNally 2004b.

As Marx explains in *Capital*, the use-value of a commodity is its quality as an item that can satisfy a human need, understood broadly; hunger, intellectual curiosity, creative expression, clothing, the need for shelter, for tools, 'the nature of these needs, whether they arise from the stomach, or the imagination, makes no difference'.[23] Use-value, which can be consumed as either a means of subsistence or a means of production, is a product of the interaction between 'useful' human labour and nature. As producer of use-value, human labour is therefore concrete human labour. This concrete labour is an activity 'determined by its aim, mode of operation, object, means and result'.[24] Useful, or 'concrete', human labour is thus labour considered from the point of view of the process that shapes and configures the natural properties of an item in order to make it satisfy a human need: the concept of concrete labour cuts through the very metabolism between humans and nature. Labour in this sense, as useful labour, 'is a condition of human existence which is independent of all forms of society; it is an eternal natural necessity which mediates the metabolism between man and nature, and therefore human life itself'.[25]

Concrete labour, it must be added, also entails a specific, concrete *time*. Indeed, every act of concrete labour embeds particular concrete temporalities, tempos, time patterns; it also involves specific concrete activities of timing, and entails specific concrete series of temporal sequences. Acts of concrete labour, as producers of use-value, entail and produce a *concrete time*. Tailoring, to take one of Marx's examples, implies a series of tasks, motion, rhythms and (dis)continuities, which establishes temporal relations in a concrete way: the stop-and-go movement of the hand holding the needle, the folding and unfolding of the fabric, the cutting of the edges, and so on, establish temporal relations between human activity and the temporal material reality, producing concrete timeframes, tempos, sequences, based on the very unfolding of the activity itself. The concrete time of tailoring is not the same concrete time as, say, baking a pie, writing a book, sowing the land, mining, riding a boat, teaching music, or building a spaceship.

Although there is a concrete time of human labour, concrete time must not be understood narrowly as only 'the-concrete-time-of-labour'. Concrete time is more broadly a fundamental condition of reality, and of human life: socially mediated natural and biological cycles, which maintain and reproduce concrete human bodies – such as digestion, sleep, pregnancy and childbirth, breathing, seasons, birth and death, sickness, sex – all entail, produce and put

23 Marx 1976, p. 125.

24 Marx 1976, p. 132.

25 Marx 1976, p. 133.

in relation concrete times. Diverse temporal processes and cycles embedded in matter, in natural objects and phenomena, and in and through human bodies, whether they are actual processes underpinning the reproduction of reality, or folded temporalities (processes which have now come to an end but remain in existence, 'folded' inside a socio-natural or human material reality),[26] come together in this metabolic relationship between humans and nature, constituting concrete times, and establishing an internal relation between humans and nature. Digestion, for instance, implies a cyclical temporality related to the ingestion of food coming from outside the body. This concrete temporality is also inscribed in the evolutionary time of stomach-bearing species and other socio-natural temporalities such as seasonal and agrarian cycles of food production, as well as social temporalities of production and distribution of food, and so on. Material reality is itself concretely temporal, and humans, society and nature are 'temporally embedded' in one another in innumerable ways. These temporal relations are mediated by forms of social time relations.

The concrete time of tailoring, in this sense, is also internally related to the folded concrete times of the production of the tools in use, of the materials in use (cotton cultivation, sheep raising, mining the metals and needle making, etc.), and through these to an ensemble of socially mediated natural cycles (day and night, geological time, seasons, etc.) and social times (of a market for clothes, of clothing styles, etc.). Concrete time is thus both a result and a condition of the encounter between humans, their practices, and temporal socio-natural material realities. It is time as (re)produced by the combinations and ruptures of these processes of interaction between humans, their social relations, and their world.

Returning to Marx's analysis of the commodity in *Capital*, one finds that, on the other hand, commodities, under capitalism, are also the 'material bearers' of 'exchange-value'.[27] Exchange-value, formed by the exchange relation of commodities, appears at first as a 'quantitative relation, the proportion, in which use-values of one kind exchange for use-values of another kind'.[28] In the exchange relation, commodities with qualitatively different use-values are exchanged on the market in given quantitative proportions. As

26 This expression is also used by Latour and Serres, but with a different meaning focusing on the a-simultaneity of the genesis of objects (see Serres and Latour 1995). Capital is also a form of folded temporalities, which have been alienated and reified, and which now dominate labour power. For illuminating discussions of the triad past-present-future in relation to capital and labour, see Fischbach 2011, pp. 65–85 and Tombazos 2013.

27 Marx 1976, p. 126.

28 Ibid.

Marx explains, the fact that two commodities, which from the perspective of their use-values are not commensurable, can still be exchanged, necessitates that they share something in common, a third term, something which makes them commensurable. This third term Marx calls 'value': 'the common factor in the exchange-relation, or in the exchange-value of the commodity is therefore its value'.[29] In this case, in being commensurable through a third term, commodities are abstracted from their physical properties, from their use-value, 'the exchange relation of commodities is characterized precisely by its abstraction from their use-values'.[30] This means that the process of exchange abstracts from the concrete physical properties of the commodity as an object that can satisfy a human need. This process of abstraction is also one of reduction. Commodities are reduced to the bareness of what they ultimately share in common: what counts is strictly the proportion in which they embody this third term, value.

Value is therefore to be investigated in the form of what is common to all commodities. Here, Marx famously states that what all commodities share in common is the fact that they embody – are material bearers of – human labour. The commensurability of commodities in exchange then also means that the embodied labour they contain must also be commensurable. But how can potentially radically different forms of human labour be commensurable? Marx's labour theory of value posits that commodities in capitalism bear value because *abstract* human labour is congealed in them: 'A use-value, or useful article, therefore, has value only because abstract human labour is objectified [*vergegenständlicht*] or materialized in it'.[31] Here appears the other side of the dual character of labour in capitalist societies, 'human labour pure and simple', the very expenditure of human labour in general, or, in Marx's conceptual terms, *abstract labour*, commodified *labour power*. Seen from the perspective of capitalist commodity exchange, human labour is reduced to labour power, and it is in the form of abstract labour that it is expressed in value, 'in so far as it finds its expression in value, it [labour] no longer possesses the same characteristics as when it is the creator of use-values'.[32] Abstract labour is a specific product of capitalist processes of commodification that reduce the richness of human labouring activity to an expenditure of energy.[33]

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29 Marx 1976, p. 128.

30 Marx 1976, p. 127.

31 Marx 1976, p. 129.

32 Marx 1976, p. 132.

33 The 'reduction' of labour to labour power is also a process of abstraction from their inequalities: 'Equality in the full sense between different kinds of labour can be arrived at

The magnitude of the value of a commodity refers to a quantity of abstract labour congealed in it. By definition, a quantity must be measurable, but how to measure such a quantity of abstract labour? The amount of labour power congealed in a commodity is measured as labour-*time*, through *abstract time-units* with respect to the duration of labour expenditure – retroactively validated through *socially necessary labour time*, but more on that below. In this case, time-units become quanta expressions of measurement of the duration of labour power's expenditure. Labour power, in other words, is expended as 'labour-*time*', and it was also bought in this temporal form, i.e. the buyer of the commodity 'labour power' buys a certain quantity of it in terms of duration, and this duration is calculated in equal time-units. The labour-time congealed in a commodity, which then appears in money, has therefore a specific time-form, the abstract time-units of clock-time, or, as Tombazos puts it: 'labour-time as it appears in money can only be the homogenous and abstract time of the clock, whose parts (minutes, hours, days) are exactly identical'.[34] Such a process of measuring the quantity of labour power congealed in commodities, which is at the very basis of the formation of value in capitalist societies, is thus fundamentally related to, and inseparable from, the existence of abstract time-units, which can measure the expenditure of labour-time in a socially valid way.

The process through which different times of labour are made commensurable therefore entails the expression of the duration of labour power's expenditure in terms of abstract, equal and constant units of time. In the same way that capitalist processes of value formation and exchange put in common commodities that have otherwise nothing in common by abstracting from their qualitative properties and reducing them to a third term (namely, value), they also put in common concrete times that are otherwise incommensurable with each other by abstracting from their concrete properties and by reducing them to a third term (a quantity of abstract time), which in this case is a constant sequence made of the succession of equalised empty and homogenous durational time-units. Accordingly, one aspect of the formation of value in capitalist societies implies not only an abstraction from the physical properties of an object, but also from the concrete times and temporal relations of a process, which become expressed in an abstract standard.

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only if we abstract from their real inequality, if we reduce them to the characteristic they have in common, that of being the expenditure of human labour-power, of human labour in the abstract' (Marx 1976, p. 166).

34 Tombazos 2013, p. 18.

Capitalist value is therefore in part the result of processes of temporal abstraction and reduction. As such, the time of value is abstract time, or, put differently, capitalist value relations are predicated on abstract time. Indeed, in capitalist societies, abstract time occupies a similar position with regard to concrete time as value does with regard to use-value, and abstract labour with regard to useful labour. From the fact that the different concrete labours, producing different use-values, are made commensurable through their conversion into abstract labour, it follows that in this same movement of abstraction and reduction, the different concrete times of different concrete labours are abstracted, reduced to abstract time, and made commensurable through their expression in clock-time units. This shows how the process of abstraction and reduction at work in capitalist value formation is multifaceted, the abstraction from use-value being in this process concomitant to the abstraction from concrete labour, and to the abstraction from concrete times.

In summary:

1) Concrete labour produces use-value via concrete time.
2) Abstract labour produces value via abstract time.

The conditions that make possible the ascendancy of (2) over (1) are social and historical. They are (i) the existence of a socially valid system of time-reckoning comprising abstract time-units, and (ii) the commodification of labour and the market mediation of human reproduction in society.

(i) The existence of a socially valid system of time-reckoning resting on abstract time-units is an essential condition for the ascendancy of (2) over (1) because of a further crucial aspect of labour-time related to value formation in capitalist societies. The value of a commodity, indeed, can only be measured and validated through a further process of averaging out. The amount of labour-time formative of a commodity's value is not the amount of labour-time spent by the particular worker who has produced this particular commodity. Rather, value comes from the average labour-time, by social standards, required to produce the commodity: the 'socially necessary labour time' required for its production in a specific socio-historical context. As Marx puts it, 'Socially necessary labour time is the labour-time required to produce any use-value under the conditions of production normal for a given society and with the average degree of skill and intensity of labour prevalent in that society'.[35] This operation, at the basis of the law of value, occurs through market exchange.

35 Marx 1976, p. 129.

In the exchange relation, socially necessary labour time standards are asserted, and the quantity of abstract labour-time congealed in the production of a commodity is therefore subject to a retroactive validation when exchanged on the market.[36] This retroactive effect of socially necessary labour time is a crucial operation of the law of value, installing a coercive 'presentist' temporal norm for expenses of labour.[37] Marx thought of it as a formidable force, comparing it to 'a regulative law of nature'.[38] Whereas abstract-labour is the substance of value, its magnitude is given by the quantity of labour-*time* understood in this social way, in which the average of social labour time as a whole is the point of reference.

Crucially, this points to the fact not only that abstract time-units must be in existence in order for capitalist value to be formed, but also that such abstract time-units must also have a social objectivity, a social validity – i.e. they must be recognised, usable and used by every actor involved in the market – for this retroactive aspect of valorisation by the market to occur and for the law of value to hold sway. This form of abstract time has to encompass the social field in order to accompany value formation, synchronise and coordinate production, circulation, and so on. Not only in use at the point of production, it also has to be institutionalised to some degree in order to coordinate market operations[39] (more on that below). It is only when capitalist social relations become hegemonic in society that socially necessary labour time acquires the function ascribed to it by the law of value, that it becomes 'the standard of value'.[40] After all, Marx's point is precisely, as Fischbach puts it, that value is

36 Marx 1976, pp. 129–31; see also Tomba 2013, pp. 138–44, and Tombazos 2013, chapters 2–3.

37 Fischbach 2011, p. 107. See Fischbach's analysis (strongly influenced by Postone) of the relationship between the time of production and the time of value as 'static, spatialized' and 'perpetually present' (2011, pp. 76–85, 107–12).

38 Marx 1976, p. 168.

39 Tomba's position here, albeit slightly differing in emphasis, is as pertinent as it is thought-provoking, as he reads a 'double temporality' into this, synchronised through capitalist competition: 'The clock measures the labour-time concretely performed in production, while the time of abstract labour objectivised in the same commodity as socially-necessary labour – thus, as exchange-value – has a social measure, given by money. The first temporality is measured by the capitalist or his overseers with the stopwatch in his right hand and *The Principles of Scientific Management* in the left; the second temporality is, instead, regulated on the global markets. The synchronisation of these two temporalities takes place in the competition between capitals through the capitalist exploitation of labour-power' (2013, p. 103).

40 Harvey 2006, p. 35.

itself 'fundamentally a temporal determination'.[41] As such, as capitalism takes hold of social relations, abstract time takes hold of social time relations.

As discussed earlier, the existence of such abstract time-units is a product of history. Marx made a similar point when he noted that the uses of things and their forms of measurement have been 'discovered' by humans throughout history: 'The discovery of these ways and hence of the manifold uses of things is the work of history. So also is the invention of socially recognized standards of measurement for the quantities of these useful objects'.[42] Here Marx tells us that the standards used as measures are the 'work of history', i.e. social constructs that have a history. Clock-time is one such construct.

Commodities under capitalism have a common value-form, but the labour-time congealed in them also has a common 'time-form'. An analysis of this 'time-form' illuminates the intricate relationship between abstract clock-time and value. Abstract time gets embedded in value formation in capitalist societies to the extent that it accompanies the whole cluster of determinations formed by capitalist value. Indeed, in its function as a quantitative measure of objectified abstract labour in commodities, abstract time is a fundamental part of the whole edifice of capitalist value formation. Such a cluster of determinations implies that abstract clock-time measures labour-time, which is a quantification of expenditures of abstract labour, which is itself the substance of value, whose magnitude, expressed in money, is deduced in commodity exchange relations from socially necessary labour time standards. Value formation, in capitalist societies, is thus merged with abstract clock-time.

As such, labour and time become fused in a very peculiar way in capitalism. Indeed, capitalist value formation entails that abstract labour is tied to abstract time. This systematic fusion of human labour with abstract time is a capitalist specificity, the performance of labour in non-capitalist societies remained predicated mostly on its own specific cluster of concrete times-of-labour. The transition to capitalism is therefore also a transition from concretely predicated 'times of labour' to abstract 'labour-time'. The performance of labour in capitalism becomes predicated on this relationship of abstract labour and abstract time, labour becomes labour power, which is valorised in terms of labour-*time*. Capitalist value formation displays a tendency to abstract from the concrete times of labour, to disembody labour from its concrete times. This disembodiment, this abstraction of labour in capitalism, occurs in its fusion with a disembodied, abstract time. Labour under capitalism is both useful and abstract at the same time, and as such the struggle between capital and labour

41 Fischbach 2011, pp. 66–7.

42 Marx 1976, p. 125.

is also a struggle between the abstract time of capitalist value formation and the concrete times of human and social life.[43]

Capitalist Appropriation

As Marx has shown, labour power is a 'special' commodity. Like other commodities, labour power has a use-value and an exchange-value. Its exchange-value is fixed in the wage, which is standardised around the socio-historically determined value of its own material reproduction, i.e. the reproduction of the worker's body and capacity to work. Its use-value, however, is to produce exchange-value, and this is what makes labour power a special commodity. What Marx shows in *Capital* is that the consumption of labour power's use-value in production (by the capitalist) produces more value than has been expended in its purchase. In short, the value produced by the worker and appropriated by the capitalist (labour power's use-value) exceeds what the worker receives in terms of wage (labour power's exchange-value). The worker works an extra amount of time, 'surplus labour time', compared to what is necessary for her own reproduction, 'necessary labour time'.[44] This 'surplus' amount produces surplus value, which is appropriated by the capitalist and realised on the market. This extra duration of labour with regards to its own reproduction, this excess in labour-time that produces surplus value, is the specifically capitalist way in which surplus labour is pumped out of producers under capitalist social-property relations. From the appropriation by 'extra-economic' means that characterised pre-capitalist social-property relations, there is a passage onto 'economic' appropriation, appropriation in the process of production itself.

Of interest is how such a process also entails a change in the time of appropriation, as was briefly noted earlier. While the 'extra-economic' moment of appropriation in pre-capitalist social-property relations came after the moment of production (or even before it when codified in advance in customs, contracts, law, etc.), and necessitated forms of power predicated on legal, political, military or other extra-economic means, the moment of appropriation in capitalism is now temporally fused with the moment of production: production and

43 Fischbach discusses the temporal struggle between capital and labour, albeit from a slightly different angle which mobilises Lukács's work more directly, emphasising the opposition between past labour (capital) and future labour (labour power). Despite the difference in approach, Fischbach conveys the fundamental idea of temporal struggle in brilliant fashion, as for him, capital must 'capture the time of living labour to transform it into the time of its own valorisation' (2011, p. 75).

44 Necessary labour time is here understood in the sense of the time necessary for the production of labour power (see Marx 1976, p. 325, n. 5).

appropriation occur simultaneously, they are part of the same process. What form of authority, of power, then presides over this form of appropriation simultaneous with production? After all, the wage contract is an agreement made between a 'free' producer and a buyer of labour power, and the form of authority that makes possible this form of appropriation is not directly visible from the point of view of exchange. Besides property, one form of power involved in purely 'economic' appropriation is built around the time-compulsions brought about by clock-time. In other words, the 'economic' power of appropriation, of the market, includes the 'power of time' *qua* time-compulsion, as a temporal arrangement and context, predicated on abstract clock-time, under which it is possible for surplus to be pumped out – as the use-value of labour power is consumed for a longer period than the worth of its exchange-value. Out of the ensemble of means of coercion through which capital indeed makes labour work longer or more productive hours, some are very clearly predicated on time-compulsion. In short, from modes of appropriation in which appropriation is made after or before production through social power predicated on weapons, social status, customs, laws, faith, or other 'extra-economic' means, the power of appropriation under capitalism comprises a time-compulsion and a time arrangement based on abstract time, in which surplus is pumped out of labour simultaneously to its very expenditure.

Under capitalism, labour and its exploitation are temporally fused through the apparatus of clock-time and its abstract time-form. As such, on the one hand, we have a fusion between labour and (abstract) time under capitalism, and on the other, we also have a fusion of the moment of production and the moment of appropriation. The very possibility of a historical transition from 'extra-economic' to 'economic' appropriation, to appropriation in and through production, can be seen as concomitant with the fusion of human labour with abstract time-units, with the passage from the 'time of labour' to 'labour-time'. The appropriated surplus does not take the form of a surplus product or concrete labour, but of a surplus duration of abstract labour-time. As capitalist value is in many ways a temporal determination, so is surplus-value, and so is its appropriation.

Let me now turn to the other condition (ii), which makes the ascendancy of abstract time over concrete time possible: the formation of a fully-fledged labour market.

3 Labour Market, Capitalist Industrialisation, and Clock-time

The socio-historical roots of such a fusion between human labour and an abstract form of social time are to be found in the emergence of 'labour power',

i.e. in the socio-historical process of the commodification of human labour. The formation of a labour market, the consolidation of social relations in which human labour is a commodity, represents a meeting point between capitalist relations and clock-time.

As discussed above, the historical transition to capitalist social relations in the English countryside was characterised by an increasing commodification of labour in the form of labour power. Such a process, i.e. the formation of a labour market, is a specific characteristic of the historical development of capitalist social-property relations. As Braverman puts it, 'Capitalist production requires exchange relations, commodities and money, but its *differentia specifica* is the purchase and sale of labour-power'.[45] Figures put together by historian Robert Lachman show an unmistakable increase in the number and proportion of English peasants employed as wage-labourers during this transition phase: from around 10 percent before the third quarter of the sixteenth century, there is a dramatic rise starting around 1567 to the extent that by 1600, 35 percent of peasants are employed as wage-labourers, while the figure goes up to 56 percent at the moment of the Glorious Revolution of 1688. For the same period, in England and Wales, the percentage of landless peasants goes from 11 percent around 1550, to 40 percent in 1640.[46] The revolutions of the seventeenth century further consolidated and accelerated the legal, economic and political processes associated with the creation of a labour market.

These emerging social relations in the English countryside produced a differentiation of the English peasantry, mainly between wage-labourers and capitalist tenants, who increasingly became the sellers and buyers of labour power in a growing labour market. This process was accompanied, as discussed in the previous chapter, by a destruction of communal property rights, and the consolidation of land into large holdings.[47] Historically speaking, the commodification of labour went to a great extent hand in hand with the commodification of land: the creation of large holdings meant severing small occupiers from their means of subsistence, forcing them to sell their labour power on the market in order to make a living.

The emergence of a labour market and capitalist social-property relations is also related to the growth of trade and industry, which 'created new capitalist fortunes, expanded markets for agricultural products and generated a flow of

45 Braverman 1974, p. 52.

46 Lachmann 1987, pp. 17, 129.

47 This last feature is especially true for the sixteenth century. The sale of Church land participated in the growth of a land market. As McNally remarks, 'The sale of Church lands thus accelerated the social differentiation of the peasantry, the trend towards enclosure and consolidation, and the increasing presence of large capital farms' (McNally 1993, p. 10).

bourgeois investments in the land'.[48] Then again, the cities and urban centres should not be the only focus of attention: with regards to the late Middle Ages and early modern period, Rodney Hilton has noted the shift of the manufacturing industries in England from the urban centres to small towns and villages where there occurred a growth of small-scale commodity production, especially in pastoral regions.[49] As McNally summarises, two patterns of socio-economic life cohabit and feed off each other in England around 1600, 'one based on large-scale arable farming; the other involving regions which combined pastoral agriculture with growing rural industries'.[50] Often in this transitional period, small peasants would combine wage-labour with the farming of very small plots of land, more often than not less than an acre in size. Small peasants, in some instances, held on to small plots of land and cottages, a transitional feature of socio-economic life, which has some using the term 'semi-proletariat' when referring to a part of the small-peasantry in that period.[51]

The commodification of labour power, as the *differentia specifica* of capitalist production, finds its roots, in the case of England, in the transition phase of agrarian capitalism, and furthermore in the growth of small-scale commodity production in small towns and villages. McNally summarises:

> While there is no exact point of transition between petty commodity production and capitalist production which can be marked with precision, the essential features of this process can be clearly delineated. In essence, they involve the metamorphosis of peasant craftsmen or yeoman manufacturers into merchants and employers, who subordinate the labour of a growing number of small producers, and who market their own output (and that of others).[52]

Accordingly, the emergence of industrial capitalism does not proceed from a separation between agriculture and industry: for a significant period of time, industrial production is predicated on a domestic system connected to capitalist agriculture, and by the growth, as Hilton indicated, of rural industries. The market increasingly becomes a compulsion, instead of an opportunity. It is the market dependence of producers and appropriators that increasingly subjects the reproduction of society, as well as the life of individuals, to market 'rationality' and to the law of value. The commodification of labour, the emergence

48 Ibid.

49 Hilton 1985a, p. 136; McNally 1993, p. 25.

50 McNally 1993, p. 25.

51 See McNally 1993, pp. 11, 15, 18.

52 McNally 1993, p. 27.

of abstract labour in the form of labour power, under the market's attribution of a price to the commodity labour, is one of the foremost processes of emerging capitalist social relations.

The formation of a labour market, as a fundamental condition of the spread and sway of capitalist social-property relations, did not happen in a social void. The creation of a free market in labour 'was the result of decades of coercive measures, embodied in a regime of law and punishment, designed to destroy communal property rights and establish the unfettered sway of capitalist private property'.[53] It also occurred in a context of widespread colonial exploitation, slavery, and specific forms of gender oppression.[54] The increasing dominance of the labour market as the main labour-allocating system underpins the processes of commodification at work from the early history of capitalist social relations to today. The commodification of human labour is a necessary condition for the passage from concrete time to abstract time, just as is the diffusion of a temporal infrastructure predicated on abstract time-units. These two processes are related. With the formation of a labour market, abstract time acquires a growing social ascendancy. In turn, the spread of abstract time runs parallel to the growth of the labour market.

4 World Standard Time

Once a labour market is formed and abstract time has spread, clock-time rises to hegemony. One telling illustration of this process is found in the institutionalisation of World Standard Time.[55] Today, the hegemony of clock-time is something that is widely taken for granted. It has become so ingrained in collective consciousness that it appears as transhistorical, especially given the fact that historical narratives and historiography in general make use of this

53 McNally 1993, p. 41. Note also that once industrial capitalism started to take hold, para-legal structures of factory discipline were not only enforced inside the workplace, but 'were often enlarged to an entire social system covering whole townships' (Braverman 1974, p. 66).

54 See among others the works of Peter Linebaugh, Robin Blackburn, Cedric Robinson and Silvia Federici.

55 World Standard Time has had many appellations, and has taken many forms. The form mostly under discussion in this chapter is Greenwich Mean Time (GMT), a time-system referring to mean solar time as observed from the Royal Observatory in Greenwich, London, based ultimately on the rotation of the Earth. Since 1 January 1972, World Standard Time is the Coordinated Universal Time (UTC), a successor of GMT based on International Atomic Time (TAI), as defined by an average of time signals coming from atomic clocks located in different locations worldwide. Civil time, aviation, global positioning systems and the internet, just to name a few, are based on UTC.

time system to temporally locate historical and contemporary events and processes, even those that happened or unfolded long before it was institutionalised. Practices such as the use of official global dating-systems – now under the form of the ISO 8601 norm – further institutionalise clock-time hegemony. In any case, most of social life's temporal orientations occur through clock-time units and practices, and such a hegemony is a quite recent feature in the history of social time relations. As capitalist social-property relations came to shape the reproduction of society and social life, as the labour market became the main way to allocate social labour, as the accumulation of capital directed more and more human activities, clock-time rose to ascendancy as the hegemonic form of social time relation.

What exactly is entailed by the expression 'rise to social hegemony'? Does it describe a process in which other times are extinguished or negated by clock-time? Does it mean that clock-time eradicates the multiplicity of social times? On this count, the answer is no. 'Hegemonic', here, does not mean 'sole' or 'only'. It rather means that capitalism's tendency to abstract from concrete times and to reduce them to a common denominator, thus alienating and subsuming the multiple concrete times which make up the social fabric, is precisely that: a *tendency* ingrained in processes of capitalist valorisation. This hegemonic form of social time is thus embedded in the formation and appropriation of capitalist value, and tends to alienate and subsume concrete times, in a process that entails a logic of domination and resistance. In other words, clock-time's 'hegemony' means that it tends to dominate and subordinate other time relations, i.e. it becomes the dominant ordering of time, but always in a contested relation with other temporalities – I return to that point below to clarify the relationship between clock-time and other social times, which can be grasped through the concept of alienated time. Such a focus on clock-time is thus not meant to downplay the social and personal significance of the multiplicity of times, but rather to highlight the tendency of clock-time to alienate them. Also of importance is that the use of the term 'hegemony' gestures to forms of consent. Although resistance to clock-time unfolds in many ways, agents also consensually reproduce clock-time relations through their behaviour and practices: clock-time is by no means the object of permanent revolts, and it has become ingrained in collective and personal practices and consciousness to a great extent.

As capitalist social-property relations came to exert their sway over parts of Western Europe and the United States during the eighteenth and nineteenth centuries, abstract time rose to hegemony in the form of clock-time. The institutionalisation of World Standard Time in the nineteenth century epitomises this process. With World Standard Time, not only did clock-time penetrate the

very fabric of social productive activities, it also progressively came to subsume local and regional systems of time-reckoning under one integrated system across space. Societies in which capitalism had become the dominant form of social-property relations are also societies in which clock-time first became the hegemonic social time relation. It is also more often than not these same societies which exported and imposed clock-time on non-Western societies through colonialism, imperialism, or other forms of geopolitical pressure. The domination of the West over other parts of the world through colonialism and imperialism meant that the hegemony of World Standard Time did not stay confined to capitalist states, but spread to the globe as a whole. As Rifkin puts it,

> It took six hundred years to revolutionize the temporal orientation of Europe. It took only one-third of that time to extend the temporal revolution to countries and cultures across the globe. In the sixteenth, seventeenth, and eighteenth centuries, European armies colonized the territories of the planet. In the nineteenth and twentieth centuries, European and American industry colonized the time frame of much of the rest of the world.[56]

World Standard Time was first institutionalised towards the end of the nineteenth century. Although the idea of a coordinated world time system had been discussed by authorities in countries such as Germany, England, France and the United States, whether on the grounds of scientific, economic or military concerns, World Standard Time built on pioneering practical implementations of standard time made by one of the distinct products of the growth of capitalist production: the railroad system.[57] Britain took the first step towards standard time in 1847 when the British Railway Clearing House called for each company to harmonise local times into one standard, Greenwich Mean Time (GMT), which is the mean solar time as observed in Greenwich, in southeast England. The invention of the telegraph, first tried out about a decade earlier, had made it possible to send a time signal almost instantaneously to a network of railway stations. Local times were soon subsumed under standard GMT, despite 'considerable psychological and social resistance' from local communities wanting

56 Rifkin 1987, p. 134.

57 The growth of the railroad system, for example, in the US in the nineteenth century, is striking: in 1832, the US had 229 miles of railway lines, by 1880, they were 94,671 miles long (Bartky 1989, p. 29). Roughly fifty thousand miles of new lines were built in Europe between 1850 and 1870 (Nguyen 1992, p. 32).

to preserve their local times from 'railway-time aggression'.[58] In 1880, GMT was legally adopted as standard time for the whole country – as it had already been playing a similar role in the world of navigation and shipping, and was already at work in various sectors of socio-economic practices to the extent that Royal Assent merely acknowledged what was already a widespread practice in nineteenth-century England.[59]

The railroad companies were also the innovators in terms of standard time in the United States. Prior to this, hundreds of different local times worked independently of each other and efforts to standardise had already tried to harmonise railroad times without much success. As Kern relates,

> Around 1870, if a traveler from Washington to San Francisco set his watch in every town he passed through, he would have set it over two hundred times. The railroads attempted to deal with this problem by using a separate time for each region. Thus cities along the Pennsylvania Railroad were put on Philadelphia time, which ran five minutes behind New York time. However, in 1870 there were still about 80 different railroad times in the United States alone.[60]

In such a context, which seems from our contemporary perspective like a temporal chaos, it is on 18 November 1883 that the American railroads imposed a uniform time system on the country as a whole, ending the confusion that had made a dent in their profits.[61] Indeed, as capitalist production was increasingly in need of coordination inside and between economic regions, as the movement of goods and commodities over great distances with the development of unified markets increasingly determined the rate of profit, as the production and realisation of surplus value called for a uniform time-system,[62] the railroad system was the major player in the imposition of standard time both in Britain and in the US. Notwithstanding resistance, the transition from a 'specialised' railroad time to a fully-fledged civil and public time was made rather swiftly:

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58 Landes 1983, pp. 286–7.

59 Falk 2008, p. 72; Rifkin 1987, p. 133; Landes 1983, pp. 285–6; Nguyen 1992, p. 32. 'By the time Royal Assent was given to the Statutes (Definition of Time) Bill on 2 August 1880, practically all (98%) of the public clocks in England had already been set to GMT' (Nguyen 1992, p. 32).

60 Kern 1983, p. 12.

61 Ibid.

62 For a thorough analysis of the temporalities of capital's 'turnover time', as the sum of production and circulation time, see Tombazos 2013, pp. 167–215. See also David Harvey's work, especially his concept of 'socially necessary turnover time' (Harvey 2006).

cities in the US quickly passed ordinances shifting their civil times to 'railroad time' and the new system rapidly became the standard form of social time.[63]

In 1884, 25 countries were represented at the International Meridian Conference in Washington, which was held at the request of then US president, Chester A. Arthur. Building on the idea of a World Standard Time, which engineer Sandford Fleming (the Canadian delegate at the conference) had been advocating since 1879 and which suggested that the Earth be divided into 24 equal time zones each of fifteen degrees of longitude, the conference participants agreed on establishing Greenwich as the zero meridian of an emerging World Standard Time system. They also determined the exact length of the day, divided the Earth into 24 zones, one hour apart, and agreed on a precise beginning to the universal day.[64] This abstract time-system was inscribed in the very landscape of the planet, as time-zone delimiting lines were drawn that cut through multiple histories of culturally and materially embedded concrete local time-systems. World Standard Time was not adopted and implemented overnight, but the process was launched and other countries would eventually join in. Although within ten years many countries such as Belgium, Austria-Hungary, Italy, Japan, the US and Britain had adopted World Standard Time, the process of complete standardisation of the globe took a while. France took some time to join, especially due to its refusal to accept an English prime meridian, but once it did, it aimed at becoming the world leader in World Standard Time institutions. In 1912, Raymond Poincaré lobbied for Paris to host the International Conference on Time, which decided on a universal system of determining time and of maintaining accurate time signals around the world. On 1 July 1913, the Eiffel Tower emitted the first time signal to be transmitted around the world, which makes 'the beginning of *world time*' an event that is actually datable.[65] From then on, local time systems would come under the sway of World Standard Time. As Kern puts it, 'Whatever charm local time might have once had, the world was fated to wake up with buzzers and bells triggered by impulses that traveled around the world at the speed of light'.[66] Multiple local social times were a thing of the past. Now stood *one* standardised public – abstract – time.

With World Standard Time, what came to dominate social time relations was an institutional form of the clock-time regime, which had progressively

63 Bartky 1989, pp. 25–6; Zerubavel 1982, p. 10.

64 Kern 1983, p. 12; Falk 2008, p. 73; Adam 1995, pp. 113–14; Zerubavel 1982, pp. 14–16; Nguyen 1992, p. 33.

65 Adam 1995, p. 114.

66 Kern 1983, p. 14.

taken hold of social time relations in parallel to the maturation of capitalism. Some writers have mentioned this relation,[67] but few have emphasised the way in which World Standard Time is a manifestation of the formation and appropriation of value in capitalist societies. This has not escaped Tomba, however, who writes of an emerging 'world-market, which synchronizes the multiplicity of temporalities to the abstract measure of the time of labour'. He continues, 'Capital requires not only clocks, but also their synchronization'.[68] The institutionalisation of clock-time assuredly goes hand in hand with the consolidation of market relations.

This relationship highlights the fact that capitalism is not a mere 'economic' system, but a social system in which the requirements and the logic of capital accumulation tend to colonise more and more social practices in contested processes. As value in capitalism is now tied to abstract time, social temporal practices will tend to be tied similarly to clock-time: since capitalist value is inseparable from abstract time, the times of practices from all across the social field will tend to be expressed according to clock-time criteria.[69] While the expression of concrete times in terms of clock-time both in aspects of everyday social life and in specific specialised spheres is not necessarily new, the hegemonic and systematic character of such practices is unmistakably a feature of capitalism and its time-system expressed at the global scale through World Standard Time. World Standard Time, in short, is the product of capitalist social time relations in which abstract clock-time has become hegemonic.

Many commentators have treated this shift to standard time as a move away from 'natural' time and towards 'social' time. Standard time is seen here as representing a fundamental severing of the relationship between humans and nature.[70] While Rifkin has emphasised the 'unnatural' character of standard time, Zerubavel has emphasised its 'artificiality', and described the shift to standard time as a move away from nature:

> The abolition of local time-reckoning practices and the introduction of supralocal standards of time mark a most significant point in the history of man's relation to time, namely, the transition from a *naturally* based manner of time reckoning to a *socially* based one. Since we no longer set our clocks by the sun, the time they indicate is no longer derived directly

67 For example, Adam 1995 and Giddens 1981.

68 Tomba 2013, p. 136.

69 See also Adam 1995, p. 101.

70 Lewis Mumford famously described clock-time as an alienation from nature, a loss of 'organic time' *qua* human time (Mumford 1967).

> from nature. With the exception of a single meridian within each time zone, there is always at least some discrepancy between standard clock time and actual solar time. In dissociating the former from the latter, we have removed ourselves one step further away from nature.[71]

For Zerubavel, what has replaced nature here is a 'principle of rationality'.[72] In such a reading, some sort of 'cunning of rationality' is at work throughout the process of the rise of clock-time, which is interpreted as an element of the rationalisation of the modern world. For Adam too, World Standard Time is the result of a process of 'rationalization': 'with the introduction of standardized world time and global time zones at the beginning of this century the rationalization of time was brought to its logical conclusion'.[73] While such a process is interpreted by Zerubavel as a move away from nature, there is no indication on his part of how the setting of standard time through clocks that are based on the measure of the number of oscillations of an atom of caesium (as it is now) would be less 'natural' than following the movement of the sun. It is not enough to posit standard time as 'unnatural', 'artificial' or 'rational', or to treat it as a mere 'machine time'.[74] What is needed is an analysis that grounds such an abstract temporal system in actual socio-historical processes creating and reproducing this *real abstraction*.

Analysing the production of this real abstraction through processes of capitalist value formation allows us to highlight the *conflict* at work in social time relations between different times, and to understand the 'multiplicity' of times as a 'struggling entity'. It also allows us to identify the *logic of power* at work – as a process of domination and resistance, of hierarchisation – in phenomena that otherwise might seem either 'neutral', neutrally 'multiple' or merely 'complex'. Domination and resistance in the present case take place in the relationship between abstract and concrete time. The abstract time of capitalist clock-time strives to abstract from, reduce, and subsume concrete times into its logic. This logic of power can be further examined by mobilising the concept of *alienation*, as well as by interrogating the way in which time is subject to the reifying processes at work in capitalist societies.

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71 Zerubavel 1982, p. 19, my emphasis.

72 Zerubavel 1982, p. 20.

73 Adam 1995, p. 88, see also p. 113.

74 Adam 1995, p. 90; Leccardi 1996, p. 170.

5 Alienated Time and Reified Time

What exactly happens to these 'multiple' social times in the period of the rise to social hegemony of abstract clock-time and capitalist social relations? While multiple local times have altogether disappeared, the multiplicity of concrete social times has not. Rather, concrete times and abstract time coexist, entering into a relationship rooted in the dual character of labour and the (contested) processes of value formation and appropriation in capitalist society. The analysis of the temporality of capitalist value has shown how time takes on a dual character, simultaneously consisting of the concrete time of actual labourers who expend their life energies in concrete labour processes, and of processes governed by abstract time and the value relations (based on abstract human labour) that correspond to it. Labour under capitalism is both useful and abstract at the same time, and as such the struggle between capital and labour is also a struggle between the abstract time of capitalist value formation and the concrete times of human and social activity. Moreover, because lived temporalities are not simply those of work, but are also those of everyday life, the seasons, festivity, reproduction, recreation, emotions, bodies, birth and death, and so on, a multiplicity of concrete times are in a tense and sometimes contradictory relation with abstract time. Abstract clock-time and the multiple concrete times of human life and socio-natural reality are part of a 'struggling entity'.

The concept of alienation is particularly helpful for thinking through the *relationship* – not merely the opposition – between abstract clock-time and multiple concrete social times. Indeed, capitalist social time relations are characterised by the alienation of time. First, put simply, time is alienated because of its commodification. It is bought and sold on the market. As noted, one basic feature of capitalism is the sale and purchase of labour power, predicated on the separation of producers from their means of subsistence and the means of production, which gives full force to the market compulsion for the producers to sell their labour, and for the appropriators to buy it. Such an exchange creates and reproduces a labour market. In this transaction, what the appropriator buys is the worker's labour power for a definite period of time.[75] Workers' time, as a result, is both dominated by, and alienated to, the appropriator, since this time is no longer under the control of the worker, but is sold to the capitalist who uses it to produce, or facilitate the realisation of, surplus value, and therefore to make a profit.

75 '[W]hat the worker sells, and what the capitalist buys, is not an agreed amount of labour, but the power to labour over an agreed period of time' (Braverman 1974, p. 54).

The time of producers is therefore alienated in capitalist societies, while in pre-capitalist societies it could be subjected to domination, but not to systematic alienation. A crucial difference between the two lies in the fact that capitalist relations of production entail alienation of the concrete time of the *labour process*. For example, it was noted previously that under feudal relations in Europe, the labour process itself was not controlled, or organised, by lords or employers. It remained mostly under the control of producers themselves. This control is transferred to the appropriating class in industrial capitalism. Upon this transfer, the labour process 'has now become specifically a process for the expansion of capital, the creation of a profit . . . [T]he labour process is dominated and shaped by the accumulation of capital'.[76] Such an 'alienation of the labour process'[77] reinforces the alienation of the concrete times of human labour. Therefore, in the passage from pre-capitalist 'time of labour' to capitalist 'labour-time', *both* time and labour have become commodities. Not merely is the producer's labour alienated, as it is in different forms in different class societies, but the *time* of labour, the concrete times of human labouring activities, is alienated as well. The commodification of labour, then, entails a specific form of temporal alienation and this specific form of alienated labour-time also exhibits symptoms of the *reification* of time under capitalist social relations. Indeed, labour-time is reified time, since it becomes itself a commodity, a 'thing' bought and sold on the market. The commodification of time therefore also entails its reification.

The alienation of the time of labour is illustrated through the example of the 'scientific management' of labour, which represents one of the purest forms of the fusion between human labour and abstract time-units, and a concrete example of the repercussions of the passage from the 'time of labour' to 'labour-time'. Scientific management represents a distinctively mature form of capitalist organisation of labour. One of its most famous variants, Taylorism, is a form of organisation of industrial labour historically applied first in the United States and Britain at the end of the nineteenth and the start of the twentieth century, before spreading rapidly to various parts of the capitalist world, especially in the context of mass production and World War I.[78]

The management, control and organisation of labour-time by the capitalist who has bought it – or his delegates – therefore found its logical development in the management, control and organisation of the labour *process* by employers. But scientific management did not come about in a fully-fledged

76 Braverman 1974, p. 53.

77 Braverman 1974, p. 57.

78 Braverman 1974, p. 68.

form as soon as industries began to flourish, or as soon as a significant number of workers were aggregated in one facility – although these processes formed its precondition. For a significant period of industrial development, the labour process remained under the control of the producers to a considerable extent, as they carried on, and sometimes built upon, the traditional methods of production they inherited from custom and guild handicraft traditions.[79] Systems of 'putting-out' also endured in various forms throughout the period of industrial development. It is unmistakable, however, that the capitalist class progressively came to exert direct control over the labour process.[80]

One way in which this has been done is the division of labour inside the workshop, the breaking down of tasks that were historically performed, for instance, in medieval craftsmanship, by one producer, into different tasks that were now to be performed by different workers. As such, the separation of operations of production and their assignment to different workers are the two fundamental processes at work in the manufacturing division of labour. This division of labour is not a function of the capitalist social division of labour anarchically imposed by the market, but is rather a result of planning and control on the part of the buyer of labour power.[81]

Taylorism and its offshoots, such as 'time and motion studies', are inscribed in this context of the manufacturing division of labour and the increasing control of the labour process by the employers. 'Scientific management', as it is often called, can be seen as a way to tackle scientifically the problems of the control of labour in the most efficient way. It is, in Braverman's words, 'a science of the management of others' work under capitalist conditions . . . [It is] an answer to the specific problem of how best to control alienated labour'.[82] Taylorism was part of a concerted and conscious effort of the capitalist class to bring the labour process completely under their control: 'control over the labour process must pass into the hands of management, not only in a formal sense but by the control and dictation of each step of the process, including its mode of performance'.[83] However, the control of the labour process is not only about 'labour'; it is also, crucially, about labour-time. Other people's time is

79 However, the problem of management did arise already in this period, in a 'rudimentary form' (Braverman 1974, p. 59). One can find socio-historical roots of the passage of the control over labour processes from producers or custom to the buyers of labour in the phase of agrarian capitalism in the relation between tenants and wage-labourers.

80 Braverman 1974, p. 53.

81 Braverman 1974, pp. 70–5.

82 Braverman 1974, p. 90.

83 Braverman 1974, p. 100.

also 'scientifically managed' under capitalist relations. In this sense, scientific management represents an answer to the specific problem of how best to control and organise alienated *time*.

Taylorism is based on three principles. The first revolves around the knowledge associated with the performance of a task, which shall pass onto the managers. As Taylor himself put it, 'the managers assume . . . the burden of gathering together all of the traditional knowledge which in the past has been possessed by the workmen and then of classifying, tabulating, and reducing this knowledge to rules, laws and formulae'.[84] This knowledge, which the managers shall develop, gather, and ultimately monopolise, was historically embedded in the performance of the task itself, and thus belonged to the producer:

> [F]rom earliest times to the Industrial Revolution the craft or skilled trade was the basic unit, the elementary cell of the labour process. In each craft the worker was presumed to be the master of a body of traditional knowledge, and methods and procedures were left to his or her discretion. In each such worker reposed the accumulated knowledge of materials and processes by which production was accomplished in the craft.[85]

With the emergence of scientific management, a separation of mental capacities and manual performance of labour occurs. What is separated here is the knowledge embedded in the performance of the task – of which the producer was historically the master – from the actual action. In other words, the labour process is dissociated from the skills of producers, conception is dissociated from action, 'hand' is separated 'from brain'.[86] This separation of knowledge and action forms Taylor's second principle: 'All possible brain work should be removed from the shop and centered in the planning or laying-out department'.[87] The concentration of this knowledge of the labour process into the hands of the managers occurs proportionally to the producer's deprivation of it.

This gathering and monopolisation of the knowledge of the labour process leads to Taylor's third principle, which resides in the systematic pre-planning and pre-calculation of all elements of the labour process by the management

84 Taylor, cited in Braverman 1974, p. 112.

85 Braverman 1974, p. 109.

86 Braverman 1974, pp. 113, 126.

87 Taylor, cited in Braverman 1974, p. 113.

staff.[88] The labour process itself is therefore completely alienated from the producers, who, instead of being masters of their crafts and their concrete times, become mere appendages of a labour process designed in its entirety by the management staff.[89] These Taylorist principles and their practical application to capitalist labour illustrate a core tendency of capitalism: that of reducing human labour to homogenised, empty, constant and standardised labour power.

To add on to this reduction of human labour to labour power, these principles also illustrate the extent to which the concrete time of labour under capitalism is reduced to homogenised, empty, constant abstract labour-time. Not only is the knowledge of the labour process alienated from the producers, so too is the mastery over the process itself. The producer's labour comes to be inextricably embedded in abstract time measurements, whereby the concrete temporalities, time patterns, time-sequences and timeframes of the task are determined by an alien will, that of the accumulation of capital embodied in the management staff.[90] While pre-capitalist producers exerted their knowledge of time sequences, socially mediated natural processes and cycles of change, timing, and so on, in order to fulfil the tasks involved in their labour (i.e. they controlled and organised the *processes* involved in their labouring activities), producers under capitalism are subjected to an alien time, since the concrete time of the work process, and what it entails as per the producer's brain and body functions, knowledge, and performance of the tasks, are abstracted from their concrete properties and reduced to empty abstract time. Indeed, one of the basic operations of Taylorism is the breaking down of each particular movement involved in the labour process in order to 'time' it. In so doing, each of the smallest movements of the body or process of work is attributed an abstract standard duration. It is by measuring, formatting, and abstracting the concrete times of the labour process that Taylorism brought the control of the labour process to a new level.

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88 Pre-planning in itself is obviously not necessarily a 'new' feature of capitalism. Peasants often pre-plan their work, and communal production often entails pre-planning. 'Planism' is actually often described as the antithesis of market anarchy. If capitalism relies on market mechanisms to allocate resources, it must be said that *inside* most capitalist firms, the market is far from being free, and 'planning' is used as a very rational and efficient allocator of resources.

89 The image of workers as mere appendages of the labour process finds a forceful expression in the Fordist assembly line (see Nguyen 1992, p. 40).

90 Although the capitalist class 'controls' labour-time in this way, both the time that they control and the way they control it is dictated to them by the compulsion of abstract time.

The well-known 'time and motion studies', an offshoot of Taylorism first brought about by one of its disciples, Frank Gilbreth, are still very much performed in today's factories, offices and distribution centres of all sorts.[91] Gilbreth pushed Taylor's time studies further. While Taylor's time studies aimed at measuring the duration of each component operation of a work process in terms of abstract clock-time units, it was still, according to the managing class of the time, too heavily 'tied to particular forms of concrete labour'.[92] What Gilbreth's time and motion studies brought about was the detailed investigation, classification and standardisation of the basic movements of the human body, 'regardless of the particular and concrete form of the labour in which these motions are used'.[93] The movements of the body were standardised in such a way that the resulting classification lost all ties to concrete labour, the concrete time of labouring practices was broken down by the stopwatch in order to be reassembled in terms of abstract time-units. One of the most widespread abstract time-units to have come out of these studies is the TMU, which is equivalent to 0.0036 seconds. Some other time-units, such as those stemming from studies of eye movement, are even shorter in duration. The very practices and movements of the human body, as well as the concrete time that they imply and produce as human embodiments of actual and folded socio-natural-material cycles, lose as a result their grounding in human experience, as time and motion become statistical problems and are abstracted into 'standard data' systems. Taylorism, and its various offshoots, such as time and motions studies, represents a fully-fledged form of the capitalist tendency to control the labour process and to alienate time. Alienated labour and alienated time, in the capitalist labour process, go hand in hand. As the case of scientific management shows, not only is the concrete time of labour alienated, but also the very concrete times of human bodies.

Such practices and processes are not 'neutral'. They imply a logic of domination, but also of resistance. They are inscribed in, and illustrate, the struggle between abstract and concrete time in capitalism. Assuredly the time-discipline associated with the rise of industrial capitalism was often met with fierce resistance by popular classes. The imposition of a new work regimen was contested, and producers' way of struggling evolved as the new time regime

91 Even though Taylorism as it was once known is mostly a thing of the past in the West, new managerial methods in terms of labour might very well have reinforced the contemplative – instead of active – attitude of the worker with regards to the work performed (see Fischbach 2011, p. 91).

92 Braverman 1974, p. 173; on Gilbreth and Taylor, see also Nguyen 1992, pp. 38–9.

93 Braverman 1974, p. 173.

became hegemonic: 'the onslaught, from so many directions, upon the people's old working habits was not, of course, uncontested. In the first stage, we find simple resistance. But in the next stage, as the new time-discipline is imposed, so the workers begin to fight, not against time, but about it'.[94] The processes through which time is alienated are always contested, and resistance to temporal alienation, including at the point of production, takes on many forms.

For example, such a 'time and motion' study was conducted in the distribution centre where I worked for eight years, and it implied a very clear gain in power for the employers over us workers, notwithstanding our resistance. One strategy used by the employers and the 'experts' hired to perform the time and motion study in this particular case was to take the most rapid workers as guinea pigs for the study. Those rapid workers were then posited as the 'average' performers to which the others must catch up. Another strategy resided in the very fact that an average time was ascribed to every task. This entailed, by definition, that there would always be workers performing below the average. This provided the employers with a ready-made pool of workers to harass, to threaten, and to force to augment their output of work under the pretext that they were 'below' the average, even when the average itself rose. A further point to note is that the employers dictated the way in which the tasks were to be performed. There were 'tutorials' being held for employees who could not match the 'average' time. The employers and their hired experts would try to change the way in which workers had previously performed their tasks. The labour process, broken down, was also dictated by the employers: how to perform the work was not a matter of the employee's own discretion, experience, expertise or concrete temporality, but rather was under the control of the employers, all dedicated to increasing productivity.

In this specific case, workers resisted and contested these methods with the means that were available to them in order to alleviate as much as possible the effects of the study on the amount of work they would now have to perform in a given period of time. The workers being observed for timing tried not to rush their movements, they emphasised to the employer the importance of periods of rest between periods of intense physical effort, they struggled to have time allocated for toilet breaks, to take a drink of water, and they challenged the results of the study on the basis of the risks that such timeframes and work techniques posed to their health and security.

There is nothing new in such resistance in the workplace. As a matter of fact, Taylor himself, who was a worker before becoming a 'scientific

94 Thompson 1993, p. 388.

consultant', made workers' resistance a central element in his analysis of the work process and of the dynamics inside the workplace.[95] Workers' strategies in terms of 'slowing-down', of deliberately keeping the average output of work at a reasonable rate so that every worker, regardless of physical ability and age, could meet it, as well as other forms of re-appropriation of time in the workplace, are historically numerous, and employers' efforts to combat such practices have been 'unceasing'.[96] As Beaud reminds us, Taylorism and scientific management were opposed in many workplaces, for example, leading to strikes at Renault in 1912 and 1913 where the workers refused to be timed.[97] While such time and motion studies have been standardised and applied in vast sectors of production and distribution in capitalist countries, workers' resistance based on concrete time is still very much alive.

Temporal struggles are therefore inherent to the capital-labour relation at the point of production. Recall Marx's analysis in *Capital* of one archetypical struggle of the working class, over the duration of the workday, where workers' resistance was epitomised in the demands for a limitation to the number of hours in the workday. The example of scientific management also further shows how abstract and concrete time come into conflict in the workplace, as capital accumulation and value formation and appropriation dictate the abstraction from concrete times, while workers tend to resist such a tendency. Assuredly, time is at the centre of domination and resistance in the workplace. And just as assuredly, critical theory would gain from more analyses of temporal struggles.

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The question of the alienation of the time of labour in capitalist society is central in many ways, but temporal alienation is not confined to the abstraction of an individual's concrete times at the point of production or the workplace. As noted above, the tendency of capitalist abstract time to subsume concrete times in its logic reproduces a social time relation, socially necessary labour time, which not only works in a retroactive way to determine the value of commodities, but also, as an alienated time-form, acquires a power of its own that affects society as a whole. Postone gestures towards this:

> [S]ocially necessary labour time . . . does not simply describe the time expended in the production of a particular commodity; rather it is a

95 Beaud 2001, p. 147.

96 Beaud 2001, p. 151.

97 Beaud 2001, p. 170.

> category that, by virtue of a process of general social mediation, determines the amount of time that producers must expend if they are to receive the full value of their labour-time. In other words, as a result of general social mediation, labour-time expenditure is transformed into a temporal norm that not only is abstracted from, but also stands above and determines, individual action.[98]

In this way, while the magnitude of socially necessary labour time depends on society as a whole, it is an independent variable with regards to individuals.[99] The alienated character of capitalist social relations thus entails a temporal dimension: abstract time is alienated time, and the abstract framework in which socially necessary labour time retroacts on the determination of individual labours' value makes it so that socially necessary labour time is 'the temporal dimension of the abstract domination that characterizes the structure of alienated social relations'.[100] As such, it does not suffice to highlight how workers' time is alienated. Just as the market logic of commodification tends to penetrate more and more spheres of society, alienated time is propagated to the *ensemble* of capitalist society: 'the temporal social forms . . . have a life of their own, and are compelling for all members of capitalist society – even if in a way that benefits the bourgeois class materially'.[101] The temporal experience of reified and alienated time comes to structure general social experience.[102]

This tendency to the 'autonomisation' and reification of time in capitalist social time relations has relied on the abstract form of clock-time. Of course, money in capitalism can be theorised as the form of manifestation, the material support, of abstract labour-time, and as such it is an institutionalisation of alienated and reified time.[103] However, the institutionalisation of standardised social time regimes such as World Standard Time also illustrates this penetration of social time relations by time-forms that are reified. Modern social time is very much a thing, its essence is 'out-there', beyond human reach, from the movement of the planet to the subatomic realm, as a reified form of social time relations has been systematised and universalised. The drive of capitalism to commodify has accompanied the systematisation of clock-time *qua* commodified time (i.e. its unification into one system), and its propagation

98 Postone 1993, p. 214.
99 Postone 1993, p. 215.
100 Postone 1993, p. 191.
101 Postone 1993, p. 214.
102 See also Tomba 2013, p. 108.
103 See Tombazos 2013, p. 78.

to an increasing range of social practices and regions of the globe in processes resisted to various degrees. The time of human beings, as well as the time of social practices, has come to be expressed, measured, experienced, and socially valorised in the form of clock-time. This time has colonised social temporal experiences in general. This time has also been, through cultural mediations, very much internalised by agents. The process of diffusion of house clocks and watches, the cultural meanings ascribed to punctuality, time-saving, time-efficiency, and so forth,[104] might find their social origins in capitalist practices, but they are by no means limited to the labour process.

The cultural mediations involved here are potent testimonies of the widespread change in social time relations. Indeed, the relationship between abstract and concrete time, in the lived experience of women and men, is mediated by culture. One aspect of the rise of clock-time to a position of hegemony in social time relations is a massive cultural change in conceptions of time.[105] E.P. Thompson's seminal article, 'Time, Work-discipline and Industrial Capitalism', provides a historical overview of some of the consequences of industrialisation on social time relations in England. He discusses processes of diffusion of clock-time standards, and of the internalisation of clock-time by popular and working classes – recall the passage 'from fighting against time to fighting about it':

> The first generation of factory workers were taught by their masters the importance of time; the second generation formed their short-term committees in the ten-hour movement; the third generation struck for overtime or time-and-a-half. They had accepted the categories of their employers and learned to fight back within them. They had learned their lesson, that time is money, only too well.[106]

Thompson sought to show that the changing nature of time-discipline in the period was not the result of a narrow relationship between manufacturing techniques and time-disciplines, but that it entailed broader and more profound cultural changes. In other words, Thompson does not establish a one-on-one mechanical relationship between the 'temporal-disciplinary requirements' of emerging industrial capitalism and the spread of clock-time as a 'time-disciplining' social phenomenon. Rather, he is pointing to the

104 See Weber 1964 and Thompson 1993.

105 See also Kern 1983.

106 Thompson 1993, p. 390.

cultural mediations between the two.[107] For Thompson, cultural phenomena, such as Puritanism and 'Saint Monday', to take two of his examples, mediated the relationship between the time-discipline of industrial working practices under emerging industrial capitalism and the intimate apprehension of time of living subjects. Following Thompson's line of thought, it is worth enquiring into cultural phenomena in order to find expressions and mediations of changes and consolidations of new forms of social time relations.[108]

Symptomatic of the transformative process from pre-capitalist to capitalist social time relations is the fact that conceptions of time associated with some episodic rebirths of popular realism, such as Romanticism centuries later, are drastically altered: the generally alienated character of nature in Romanticism testifies to a parallel change in cultural apprehension of temporality: the processual concrete time of medieval grotesque realism has *vanished*.[109] As discussed previously, popular 'grotesque' realism from the Medieval and Renaissance period was rooted in non-capitalist forms of social relations, and furthermore it entailed a genuine conception of time: processual concrete time. Romanticism, for its part, rooted in the period of capitalist development, expresses forms of alienation embedded in the process of the formation of a labour market and the specific forms of alienation it entailed with regards to social time relations. As Bakhtin points out, the primary contrast between popular realism and Romanticism is located in the fundamental conception of the world that they both display. While popular realism sustained the imagery of a processual and cyclical temporal world intimately related to human bodies, the people, nature and practical activities, Romanticism presents us with cultural forms in which the world is represented as gloomy, alien and hostile.

Grotesque realism had already, in the seventeenth and early eighteenth centuries, been disconnected from folk culture. Bakhtin describes the process in these terms:

> During this period (actually starting in the seventeenth century) we observe a process of gradual narrowing down of the ritual, spectacle, and carnival forms of folk culture, which became small and trivial. On the one hand, the state encroached upon festive life and turned it

107 As mentioned, Weber had obviously opened the discussion with his magisterial account of the protestant ethic of time (see Weber 1964).

108 A series of articles exploring the concept of time in philosophical enquiries of that period (Heidegger, Husserl, Bergson), and comparing it to earlier conceptions of time (Aristotle, Augustine), is forthcoming.

109 Bakhtin 1984, pp. 36–45.

> into a parade; on the other hand these festivities were brought into the home and became part of the family's private life. The privileges which were formerly allowed the marketplace were more and more restricted. The carnival spirit with its freedom, its utopian character oriented toward the future, was gradually transformed into a mere holiday mood. The feast ceased almost entirely to be the people's second life, their temporary renascence and renewal.[110]

In the period of capitalist development in Europe, the grotesque entered a new phase. Romantic grotesque was grotesque with a transformed meaning: 'it became the expression of a subjective, individualistic world outlook very different from the carnival folk concept of previous ages'.[111] One main characteristic of the Romantic grotesque, which differs sharply from its medieval form, is the alienated character of the world outlook it conveys. A 'private' outlook on the world and a profound sense of isolation, expressing forms of alienation from others and from nature, characterised this new cultural form. Alienation from others was expressed in the radically individualistic and private character of Romanticism's idealistic philosophy, as well as in the transfiguration of the meaning infusing several themes, such as madness, the mask, the marionette and the devil.[112] The gay and bright laughter of the medieval grotesque gave way to cold and ironic sarcasm; the conception of 'our world' that was inherent in the medieval grotesque was replaced by the imagery of an alien world; fear and terror of the world came to replace its regenerative power and bodily character.

The passage from pre-capitalist social time relations to capitalist social time relations thus entails important cultural transformations, such as the one described here by Bakhtin. This resonates with Thompson's point: the rise of clock-time to a hegemonic position is a process occurring as much at the level of socio-material time relations as that of culture, and of people's 'inward apprehension of time'. As the English historian puts it, 'the stress of the transition [to capitalist industrialism] falls upon the whole culture: resistance to change and assent to change arise from the whole culture'.[113]

The cultural and social transformations that accompanied this reconfiguration of social time on an alienated basis did not happen overnight. Nor is there a clear-cut, once-and-for-all, tipping point. Rather we are looking at a

110 Bakhtin 1984, p. 33.

111 Bakhtin 1984, p. 36.

112 See Bakhtin 1984, pp. 39–40.

113 Thompson 1993, p. 382.

protracted process that endured from the rise of capitalism, to the dawn of the Industrial Revolution, and all the way to the first decades of the twentieth century and beyond.

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The analysis of the alienation of labour-time is therefore a stepping-stone in the sense that it opens up the question of the temporal alienation characteristic of capitalist social time relations in general. To be sure, alienated time and reified time have become *systemic* features of capitalist societies. Such social time relations, in which the very form of clock-time and its abstract time-units have become hegemonic, are specific to capitalist societies; alienated time is inscribed in the hegemony of the commodity form as the expression of social value. Returning to the discussion of alienation in Chapter 1, alienated time can be read on three levels in relationship to the rise to hegemony of clock-time in capitalist societies: the alienation of one's own time; the alienation from 'natural' time; and the alienation of one's own time from the time of others.

The alienation of one's own time is pretty straightforward: by definition, the selling of one's time on the market amounts to its alienation. The employer's control of the labour process radicalises the alienation of concrete individual times. Moreover, nowadays abstract clock-time tends to regulate and control even one's leisure time. As the passage from the time of labour to 'labour-time' entailed the homogenisation of labour-time, emptying it from social intercourse, from other life activities intermingled with work that characterised most pre-capitalist 'times of labour', 'leisure' time as opposed to 'labour-time' was forged as a new category. 'Leisure-time' however, also tends to be controlled, defined and regulated by abstract clock-time. One of the manifestations of this resides in the way in which just as labour-time must yield as much value as possible, leisure-time must yield as much 'leisure' as possible, and that to not make the most of it, to not organise it, to not use it adequately in a 'productive-of-leisure-way' can also be seen as a 'loss-of-time'.

Tackling the question of the alienation from 'nature's' time, for its part, might lead one to operate inside a dichotomy between nature and society, and thus one must approach such a question carefully. Following Adam, McNally, and Elias, I have argued that such a dichotomy must be rejected in order to study time. Based on Adam's arguments, for example, it is not hard to see that social and natural times are *inseparable* from each other: 'natural' temporalities permeate social time, and vice versa. In this light, instead of speaking of the alienation of natural time, it would be more accurate to speak of the alienation of 'socio-natural' time in terms of money, or of an abstract framework

of World Standard Time entailing the temporal alienation of the ensemble of society, i.e. every individual's own time, and social time as a whole.

Recalling Marx's own point on the matter sheds light on such an expression as 'alienation of socio-natural time'. Indeed, Marx argues that the alienation from nature is expressed in how alienated human beings come to see their world as not belonging to them, as not of their own making.[114] The environment in which human beings dwell, the 'human world', is precisely a product of the interaction between humans – themselves socio-natural temporal beings[115] – and other socio-natural material temporal realities. However, as a result of alienation, human beings come to think of their own selves as strangers in an alien world, as dwellers in an environment not of their own making, which does not belong to them, which is subject to alien forces (however this force might be represented: power, nature, god, the market, the state, etc.) Clock-time also comes to be seen as something that does not belong to people, but rather as something 'natural', 'always already there', 'neutral'. In any case, it is very much taken for granted. The abstract and reified framework of clock-time, hegemonic in capitalist social time relations, makes it appear as if people dwell in a temporal reality over which they have no control: 'time flies', time is 'lost', 'time can never be stopped', time is independent of events, actions, and human will, the 'march of time' is unstoppable, and so it goes on. All of this occurs in a context where time has never been so meticulously organised and precisely measured. Yet time is experienced as an alien force far stronger than any human will or power. In that sense, humans are alienated from socio-natural time to the extent that clock-time, in capitalist societies, appears itself in an alienated and reified form and permeates as well as reproduces alienated social time relations.

The question of the alienation from each other's time is more complex. After all, is not the systematisation and globalisation of forms of Standard Time precisely a way to bring together, 'on the same page', everyone's and every group's time? Does not the 'commensuration' of time in the form of standard clock-time-units provide a common ground between individuals' time? Many scholars tend to see it that way. Standard Time is seen as a 'rational' development,[116] a common measure, a way of unifying the globe.[117] The myriad of social times come under one heading, clock-time, and this system of time-reckoning allows

114 Marx 1988, pp. 71–5; see also Ollman 1976.

115 As Adam beautifully puts it, '[people] *are* time, they *live* time, they *generate* time in interaction, they *fix* time in their artefacts' (1995, p. 104).

116 Zerubavel 1982.

117 Adam 1995; Kern 1983.

complex modern societies to actually function by establishing a common standard over and above everyone's particular times. There is obviously infinite potential in clock-time for temporal coordination. However, such arguments tend to portray clock-time as a simple tool facilitating social coordination.[118] If clock-time was such a tool, it would be a formidable one. Surely, reconciling the efficiency of clock-time for certain purposes with un-alienated social time relations would be one major task and challenge confronting post-capitalist societies. But the fact remains that capitalist clock-time is not a mere tool. It is a social time relation that serves the interest of some social groups more than others; it has historically been created and reproduced as a social standard through relations of appropriation and alienation; it has come to subsume the social field through the proliferation of specific social time relations and through the decisions and actions of specific social interests; and it has come to occupy a hegemonic position with regards to the ensemble of social time relations. Seen in this light, clock-time is not a mere tool of coordination, but is also a system of social discipline, a system of domination to which humans in capitalist societies have been subjected, and against which they often counterpose their own concrete temporal realities and the ones of their social groups. In that sense, the apparent usefulness of clock-time in helping to establish a common measure between different individuals and groups in order to attune different times together can be seen in another light. Clock-time is both a product of exploitative relations and a system reproducing time-discipline and temporal alienation and reification – not merely a tool that 'brings people together'. And for that matter, not everyone's time is 'brought together'. Women's time, for instance, has also historically been marginalised, indeed almost completely excluded, from the male-dominated world of clock-time. It is 'lived, given and generated in the shadow of the hegemony of universal clock-time'.[119] In that sense, the way in which 'everyone's' time comes together under clock-time is not un-alienated, but reproduces the overall scheme of temporal alienation and reification specific to capitalist social time relations, as alienated time relations negate and discipline concrete times. It is the case that the widespread degree of internalisation and consent to clock-time hegemony is very real, and that agents often reproduce these hegemonic time relations consensually. However, one effect of alienated time might very well be found in the high level of social angst that pervades societies submitted to the law of value and the empire of the clock. What is 'brought together' might be more aptly described as everyone's rush, inability to adopt long-term perspectives, and fear of losing time.

118 See Zerubavel 1982, among others.

119 Adam 1995, p. 94.

6 The Temporal Forms of Domination and Resistance

The relationship between abstract and concrete time is based on processes of value formation and appropriation in capitalist societies – therefore it is embedded in, and reproduces, class relations – and intersects with and participates in social relations of power involving specific and pervasive forms of gender, imperialist and racial oppression. The conflict between abstract and concrete times is therefore also articulated along gender and racial lines.

As noted above, 'abstract' time is interwoven in the formation and appropriation of value. This abstract time is alienated and reified, and has acquired a power of its own. Humans in capitalist societies tend to see time as this outward phenomenon, a reified 'thing' that somehow 'passes' independently from their will, lives and actions, and dominates their time-experiences as social beings. The linear passage of reified time installs a sense of an irreducible gap between the reified framework of an alien social time regime, and the personal concrete time-experiences, the 'inner' time-experience of memory, perception, recollection, and anticipation, as well as the bodily processes and cycles that make up concrete human experiences and lives.

The concept of concrete times under capitalism should further be grasped in terms of human concrete time-experiences, practices and (re)productive activities. For example, socialist feminist literature has provided valuable insights regarding the specific forms taken by the relationship between capitalism and social reproduction.[120] This literature gestures to the fact that while capital reproduces itself through the abstract time of the formation of value, it depends on the concrete times of social reproductive practices that reproduce life and labour-power. This is a further aspect which highlights the resilience of concrete times even as they are put under the sway of hegemonic abstract time. These concrete times of social reproduction, interwoven with socio-natural times and subjected to abstract time in direct and indirect ways, display specific forms of resistance to clock-time hegemony.

Such a stance differs in some ways from Postone's line of thought in *Time, Labour and Social Domination*, although his insights with regard to the reproduction of capital through abstract time are extremely valuable. Aside from the problematic 'reading back' of capitalist rationality into pre-capitalist historical settings, Postone's understanding of capitalist time is also problematic with regards to 'concrete time'. As briefly noted earlier, while he posits the abstract time of value formation as the dominant time in capitalist societies,

120 See Vogel 2014; Benston 1969; Dalla Costa & James 1972; Bakker & Gill 2003; Ferguson & McNally 2014.

he sees a conflict between the latter and the 'concrete time' of the production of material wealth – as distinct from value. This is rooted, for him, in the fundamentally dual character of labour in capitalist societies: while concrete labour produces material wealth, abstract labour produces value. Concrete labour producing material wealth, in Postone's analysis, becomes 'historical time' and propels history forward, while the framework of abstract value formation constantly reinstates itself as it is reproduced through capitalist social relations. When changes in the production of material wealth occur, they are quickly, through the capitalist laws of motion, reabsorbed by the objective and independent capitalist value framework, and as such reproduce the very distinction between value and material wealth.

It needs to be emphasised that concrete times, however, are not only the time of the production of material wealth. Concrete times are made up of the ensemble of socio-natural and human multiple times. They are the times involved and produced in the world and by the experience and reproduction of human life. They form an inextinguishable substratum of natural, social, bodily and human processes, which can never be subsumed, even as abstract time strives to alienate them and bring them under the logic of value formation.[121] Indeed it is crucial to note, against some tendencies in Postone's argument, that although abstract time is hegemonic in capitalist societies, this does not mean that concrete times cease to exist or are completely subsumed under abstract time. Concrete times resist. Capital tends to alienate, abstract and reduce concrete times, but it also depends on them for its reproduction. Therefore, as noted, the hegemonic *tendencies* of abstract time in capitalism entail a logic of power, of conflict. A complete absorption or eradication of concrete times by abstract time would surely signify the end of capitalism, as it fundamentally depends on the reproduction of nature and human life.

In this line of thought, a pressing question is whether the ongoing reproduction of the abstract tendencies of capitalist time, as it severely de-synchronises and undoes the fragile equilibrium of socially-mediated natural times, will bring about its own end, or the end of concrete socio-human times. In an era of ecological breakdown, it seems more and more likely that the blindly presentist – and blatantly suicidal – temporal tendencies of capitalism could sweep humans and their times away with them, if no revolutionary social change does away with the value framework itself.

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121 Jonathan Crary's last book exemplifies the sheer violence of such processes, as capitalist time constantly seeks new ways to integrate concrete times, including sleep, in its logic (see Crary 2013).

At the level of social relations, the conflict between abstract time and concrete times permeates broad aspects of social life. As noted, it is not only under class or labour relations at the point of production that abstract time enters in conflict with concrete time. As capitalism inherently drives to bring more and more socio-natural processes and practices, human bodies, and personal lives under the law of value (for example, the commodification of art, privatisation of water, patenting of the human genome, and so forth), the logic of abstract time tends to colonise more spheres of human experience and the socio-natural world. Two examples follow that point to the pervasiveness of capitalist time and illustrate how the conflict between abstract and concrete times is also articulated in terms of gender and racial oppression. The first case, the time of childbirth, illustrates one aspect of the gendered dynamics of capitalist temporal alienation. The second case, the imposition of Western standard time in non-Western settings, illustrates an imperialist and racialised dynamic of capitalist temporal alienation. These examples are not meant to essentialise either 'gender' or 'racial' oppression. In the same way that 'class' relations display gender and racial dynamics in specific contexts, 'gender' relations display class and racial dynamics, and processes of racialisation are interwoven with class and gender dynamics. The debates about the relationship between class, gender and race, at the theoretical level, have more to do with the level of generality or abstraction one operates at, the perspective one adopts, or the object one wishes to focus on, than with finding the most 'essential' form of oppression, or the most 'essential' identification.[122] As such, the example of childbirth is presented as an aspect of gendered temporal alienation, but involves important class and racialised elements too. The example of the imposition of Western standard time on non-Western temporal settings also displays forms of gender oppression and class exploitation. The emphasis put on 'gender' and 'race', respectively in each example, is meant to draw attention to some specific forms that temporal alienation takes within given socio-historically specific relations of power.

The first example highlights the invasion of women's concrete times of childbirth by abstract time. Feminist contributions have shed light on how capitalist social time relations entail forms of gender oppression such as the alienation of the time of childbirth.[123] Human reproduction, and more specifically pregnancy and childbirth, is a concrete temporal process, which is materialised through various connections between biological, personal and social temporal realities. This concrete process entails a cluster of specific concrete

122 On these questions, the work of Himani Bannerji (1995, 2005) offers invaluable insights.

123 Adam 1995, pp. 48–52; Leccardi 1996; Cahill 2001; Brubaker and Dillaway 2009.

times that come together in the concrete time of pregnancy itself: for example, cycles of menstruation and ovulation, time-patterns of prenatal processes and experiences, the complex processes of temporal synchronisation between the mother's body and the foetus, hormonal cycles, and many other concrete times of the body and the socio-natural world.[124] There is also a series of social determinants surrounding the time of pregnancy, childbirth and childcare: the availability or not of maternity or parental leave; timely access to healthcare; the coordination between parents' time; timely support from fathers, same-sex partners, and other related or close individuals (or lack thereof), etc. Assuredly, women's decisions during labour do not occur in a social void: 'the social relations that shape the birth, especially the amount of support a women receives and can count on receiving, influences decisions that she makes during the course of her labour and delivery, and thus her experience of childbirth'.[125] There are many variations in the socio-natural times of pregnancy and the context in which these occur that affect the birthing experience and make each one unique.

The experience of pregnancy and childbirth has undergone a process of medicalisation – especially in the West – in the era of capitalism and clock-time.[126] 'Medicalisation', here, refers to 'a process by which non-medical problems become defined and treated as medical problems, usually in terms of illnesses or disorders'.[127] Heather Cahill highlights the historical processes by which the medical establishment came to integrate pregnancy and childbirth into its discourses and practices, a process which unmistakably displays strong patterns of gender and class oppression. Focusing on Britain, she discusses how the growth of a 'medical market' in the seventeenth and eighteenth centuries has led to the medicalisation of childbirth – and therefore the exclusion of women and midwifery practices from childbirth – based on arguments mobilising ideological and gender and class-biased concepts of 'scientificity' and 'professionalism', and resting on social conditions characterised by class and gender

124 As Adam points out, each mother-foetus unity is temporally specific, but every case demonstrates time patterns that are common to all pregnancies beyond race, class or culture (Adam 1995, p. 48).

125 Fox and Worts 1999, p. 327.

126 This is not meant to counterpose an idealised 'natural' childbirthing experience to a medicalised and alienated experience. Brubaker and Dillaway (2009) signal the problem of such a dichotomisation between 'medicalised' and 'natural' childbirth.

127 Conrad 1992, p. 209. See also another definition by Conrad, where he states that medicalisation implies that 'a problem is defined in medical terms, described using medical language, understood through the adoption of a medical framework, or "treated" with medical intervention' (Conrad 2007, p. 5; also quoted in Brubaker & Dillaway 2009).

inequality.[128] While 'until the seventeenth century in this country [Britain], childbirth was firmly located within the domestic arena, an exclusively female domain',[129] a gender and class war was subsequently waged in Britain in the next two centuries and participated in the overall construction of 'male medical knowledge as scientific and therefore superior to female intuitiveness and experience'.[130] These processes led to the drastic marginalisation of midwifery and the medicalisation of women's bodies, pregnancy and childbirth. Concomitantly, childbirth was progressively spatially relocated from homes to the labour wards of hospitals.

Adam's intervention on this question highlights the extent to which the medicalisation of pregnancy and childbirth, as well as the requirements of the labour market, have led to the alienation of concrete times of pregnancy and childbirth. She provides a link between these processes of medicalisation and the conflicting times involved in the class and gender conflict over the control of pregnancy and childbirth. She quotes the following two passages from Meg Fox discussing the concrete time of childbirth: 'The woman in labour, forced by the intensity of the contractions to turn all her attention to them, loses her ordinary, intimate contact with clock-time'.[131] She continues:

> For her, time stands still, moments flow together, the past and future do not lie still behind and before her. In place of sequence, and linear relation, there is an overwhelming richness of sensation, which pulls her attention from the outer world. She is immersed in the immediacy of her experience.[132]

These quotes highlight how the concrete time experiences of childbirth are at odds with abstract clock-time. The experience of childbirth produces in many cases a disconnection from the experience of clock-time. However, in modern day childbirth practices, conducted almost exclusively in hospitals,

> everything is measured against the calendar and the clock: the timing of labour and the length of each stage, the baby's heartbeat and the progress in cervical dilation, the lengths of the contractions and their spacing. The more intrusive the obstetric assistance, the more the woman is forced to

128 Cahill 2001.

129 Cahill 2001, p. 337.

130 Cahill 2001, p. 340.

131 Fox 1989, p. 27, cited in Adam 1995, p. 48.

132 Fox 1989, p. 132, cited in Adam 1995, p. 48.

> oscillate between the all-encompassing body time of her labour and the rational framework of her clock-time environment.[133]

One aspect of the medicalisation of childbirth was the introduction of the clock and abstract timing in the representations and practices of medicalised childbirth. This is reminiscent of how, in the industrial labour process, human bodies, movements and concrete processes have become 'statistical problems'. Indeed, the experience of childbirth has also become increasingly statistical. The concrete times of childbirth have come to be evaluated against time-standards, standard curves and abstract patterns of childbirth. As a result, the experience of childbirth displays a dynamic of domination and resistance between abstract and concrete time, and the logic of power it involves imposes varying experiences of alienation of concrete times. As Adam puts it, 'the degree of clock-time imposition changes the meaning of the birthing situation from a primordial *passage from death-birth to life* on one end of the spectrum to the passive *awaiting of being delivered* of a child on the other end . . . [B]ody times are "acculturated" and socialized into the metronomic beat of the clock'.[134]

This example illustrates how social struggles display temporal aspects. Many women have struggled at first to prevent medicalisation of childbirth,[135] and since then for the de-medicalisation of pregnancy and childbirth. A crucial aspect of this conflict lies in the logic of power at work between abstract and concrete time. Adam relates a conversation with Gill Boden, in which she told an anecdote that symptomatically reveals the existence of such 'temporal conflict':

> A couple of weeks ago I was involved in a radio programme (Radio Wales) with a consultant obstetrician about Sheila Kitzinger's book *Home Birth* which had just been published. During our chat 'off the air' he was at pains to say that he thought that women like me were being a little unfair about obstetricians and that we were attacking a stereotype. I had said that one of the reasons I insisted on a home birth was that I couldn't bear to be timed in labour by doctors anxiously consulting their watches and expecting me to perform to a standard curve. The obstetrician defended

133 Adam 1995, p. 48.

134 Adam 1995, pp. 50–1. Adam is therefore sensitive to the issue of the tension between abstract and concrete times in human experience, as she speaks of how clock-time and 'body time' (or clock-time and multiple other social and natural times) interpenetrate each other in specific ways in specific situations, creating specific time-experiences.

135 Cahill 2001.

> himself and said that they did not do that anymore – why, for example, only last week he had allowed a woman to go four hours and three minutes in the second stage of her labour. I raised my eyes to heaven and said that this was exactly the kind of thing I meant and was trying to avoid. He couldn't understand that I wanted to give birth in a space where time seemed unimportant.[136]

Adam is here referring to an instance of women struggling in order to regain the power and the right to give birth at home, a practice which has been drastically marginalised, even made illegal in some contexts, by the medicalisation of childbirth. Such a movement toward home childbirth and/or birthing centres has, for instance, made gains recently in Quebec. Women's struggle has led to the implementation of 13 new midwife-run birthing centres in the province. These provide an environment which is significantly less medicalised and in which the clock plays a significantly lesser role in the actual monitoring of the birthing process. More emphasis is put on the concrete cycles and processes involved in childbirth over statistical curves and abstract timing. The experience has been in general described as truly empowering.[137]

The case of childbirth illustrates the conflict and the logic of power at work between male- and commodity-oriented practices of clock-time and concrete personal and social times, and specifically, in this case, women's time. There is indeed a crucial temporal aspect to social struggles that is in need of more attention from critical scholarship.

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The next illustration of the temporal aspect of social struggles deals with imperialism, racism and temporal struggles between different societies. We go back to the period of the advent of standardised clock-time, but look at it from the perspective that reveals it as a fundamental, if subtle, aspect of Western colonialism and imperialism.

The 'temporal' dimension of colonialism and imperialism is displayed in the dominant ideological conceptions of the West, which constructed the non-West as 'timeless', and Western standardised time as 'superior', while

136 Adam 1995, p. 49, quoting a private communication with Gill Boden in 1993.

137 Midwifery was 'legalised' only in 1999 in Quebec. Home childbirth was legalised in 2004. The first birthing centre was opened in New York in 1975 and such centres now exist in many countries such as Germany, Switzerland and Austria. Some countries, such as France, still maintain some sort of legal limbo with regard to midwifery and birthing centres.

non-Western time-systems were deemed 'inferior'. Dohrn-van Rossum points out how clocks were seen, already in the early modern period, as symbols of European superiority.[138] In some instances, the argument went so far as to suggest that the reason why the West was so 'successful' and could impose its worldview and power on the non-Western world lay precisely in the 'superiority' of the Western temporal order, i.e. on its 'rationality' and abstraction, as opposed to the 'irrational' concreteness of non-Western time systems.[139] In this context, conceptions and practices of time played an important role in the representations of the differences between 'self' and 'other' at the basis of colonial, imperial and racist ideologies. As Akhil Gupta puts it in the context of Indian temporalities, 'Notions of rebirth, and the concept of cyclicality, rhythmicity, and concreteness, have played a crucial role in orientalist representations of an exotic and inferior Other opposed to the West'.[140] The Western bourgeois male construction and representation of his own superiority was closely tied with the notion of 'abstraction' *qua* 'elevation', and the superiority of abstract time over concrete times:

> In moving from concreteness to abstraction, one develops simultaneously along cognitive, moral, intellectual, cultural, and economic dimensions. It is through this play of oppositions, by which the primitive, the rural, children, and women are assimilated, rather than by simple assertion, that the dominance of the West becomes synonymous with the development of the cultivated white male.[141]

The colonisation of local times and of non-Western time experiences by abstract clock-time is therefore also a process that displays the temporal conflict inscribed in capitalist social time relations between abstract and concrete times. And in a similar fashion to the cases of worker's time and women's time, the Western imposition of clock-time on other parts of the world has not gone uncontested. However, there is a tendency in the literature to conceive of the hegemony of abstract clock-time or World Standard Time as a progressive one-way process, which literally takes over other social time systems. There is no doubt that 'World' Standard Time is indeed 'Western' Standard Time, and that the imposition of clock-time via geopolitical pressure, colonialism and

138 Dohrn-van Rossum 1996, p. 8.

139 See Gupta 1992, p. 192.

140 Gupta 1992, p. 191.

141 See Gupta 1992, p. 203.

imperialism has sometimes meant that little was left of non-Western local time-systems. In a 1992 article, Nguyen stresses the following:

> As gradually all countries began to adopt the time zone system based upon the prime meridian of Greenwich, the specifically Western temporal regime which had emerged with the invention of the clock in medieval Europe became the universal standard of time measurement. Indeed, its hegemonic deployment signified the *irreversible destruction* of all other temporal regimes in the world, the last vestiges of which remain only in the form of historical and anthropological curiosities.[142]

The danger with such one-sided accounts – besides the technological determinist perils that threaten an argument rooting Western 'power' in the 'invention of the clock' – is that while they rightly highlight the sheer sweeping power of World Standard Time's takeover of the world, they tend to downplay contestation and resistance, and often leave unexplored idiosyncratic social processes through which local social times get colonised by abstract clock-time, but nonetheless retain a significant substratum of their – often rearticulated – concrete times. Nguyen's quote, for example, seems to suggest that abstract time is 'alone' in capitalism, and that concrete times are being completely subsumed under it. Postone's narrative might face similar pitfalls.[143] Such accounts fail to emphasise that capitalist abstract time is a *tendency* emanating from capitalist social time relations in the processes of valorisation. This tendency is no doubt strong and persistent, and sometimes penetrates concrete times in truly noxious ways. Nonetheless, it can never do so completely, and the struggle between abstract time and concrete time, especially in non-Western societies, often results in idiosyncratic social times that display different patterns of interpenetrations of abstract and concrete times.

Mike Donaldson's work sheds light on such a struggle between non-capitalist concrete temporalities and capitalist time, in the process of resistance of Australian Aborigines to abstract clock-time since the period of British colonialism and white settlement. Donaldson's piece is important in many regards, mostly because it provides a great historical example of the imposition of capitalist abstract time on a society that did not previously organise itself around abstract time based on processes of capitalist valorisation. Challenging a one-sided account that would present the advent of abstract clock-time as a process devoid of struggle, Donaldson states that

142 Nguyen 1992, p. 33, my emphasis.

143 See McNally 2004.

> after all capitalism impacted *on* something. It came to living, vibrant, changing social orders, possessed of their own stresses, strains and motive forces. And it came unevenly, affecting different parts in different ways, over different periods of time, with dissimilar results.[144]

Two moments in particular from Donaldson's account shed light on the impact of capitalist social time relations on Aboriginal temporalities. First, he discusses the concrete time-system of pre-colonial aboriginal life in Australia. Second, he stresses instances of the struggle between abstract clock-time and aboriginal temporalities. His account depicts social time relations as a struggling entity, and temporal struggles in the process of colonialism and resistance in Australia. What is more, this example, as Donaldson points out, highlights the possibility of successful resistance to clock-time, since it shows Australian Aborigines' 'successful resistance to attempts to dispossess them of the Dreaming, and the continued assertion of their own temporal order against standardized metric time (nevertheless taking from it certain agreeable features)'.[145] In this context, temporal struggle and resistance were 'fundamental to the contestation which defeated British attempts to crush aboriginal culture'.[146]

Pre-colonial Aboriginal social time relations in Australia, according to Donaldson, were predicated on socially mediated natural processes, especially the seasons. The cosmology of the Dreaming was a widely shared cultural trait informing the time systems of many groups, and this cosmology had organic ties to seasonal cycles.[147] Aboriginals organised their relations with their environment and surrounding ecologies based on a concrete temporality of socially mediated natural processes, especially given their nomadic character. Time was closely tied to cycles predicated on movement across the land and the changing availability of food. As such, social interactions in and between groups were tied with the changing seasons. As Donaldson puts it,

> [Concrete] [t]ime was a crucial factor in defining this dynamic relationship between the people and the wide range of ecologies they inhabited.

144 Donaldson 1996, pp. 187–8.

145 Donaldson 1996, p. 189.

146 Ibid.

147 It is important to note that 'Aboriginals' do not form a homogenous group. One should keep in mind the sheer diversity of aboriginal culture. More than 900 different social groups, speaking 200 different languages and occupying 16 major regional spaces were present in Australia at the beginning of British colonialism (Donaldson 1996, p. 190).

> Between the coastal areas, forests, inland river systems and desert, there were substantial differences in the quality, number, availability and variety of potential resources. The utilization of these resources was organized according to the seasonal cycle, in which the range of sequential and circular human movement was a function of the time it took to move across the landscape in relation both to very long periods as well as short intervals.[148]

Such a form of social time relations thus displays a strong relationship to seasonal cycles with which the cultural symbolic times implied in the rituals, practices and representations of the Dreaming were tied up. The Dreaming cycle was the bond linking together locality, season, time, human and non-human.

The concreteness of such social time relations is displayed in how aboriginal groups attuned their time to natural processes, and mediated these through practical activities, which displayed characteristics radically at odds with the repetitive, homogenous and constant character of capitalist labour processes. For example, only on bad days would aboriginals have to work six or seven hours (in terms of Western standard clock-time) in order to meet material needs.[149] Moreover, the time of labour was not emptied of other social aspects as happens when it becomes 'labour-time': 'there was no regular alternation of work and leisure, or, more accurately, a non-recognition of that dichotomy. Days were not divided into work and non-work. The Aborigines knew no weekend'.[150]

Telling time, in such a context, was not tied to abstract time-units or abstract-linear measuring systems. Rather, the cycles created through the movement of social groups predicated on seasons made it so that 'Time, place and people were as one. Time was central to where one was and with whom. One knew the time by the place one was in, and by the company one shared'.[151] Telling time and time-units were thus instances of socially mediated natural cycles and processes, and of social intercourse:

> Daily time was marked by daybreak, sunrise, morning, midday, afternoon, late afternoon, sunset, evening and night. Time could be and was counted by sleeps, moons, phases of the moon and by seasons. Seasons were marked by religious ceremony, by temperature, winds and weather;

148 Donaldson 1996, p. 191.
149 Donaldson 1996, p. 195.
150 Donaldson 1996, p. 192.
151 Donaldson 1996, p. 194.

> by the appearance and disappearance of particular people and groups of people: the arrival of certain blossoms, plants, insects, birds, fish, animals, each according to their locality.[152]

With British colonialism came a very different form of social time: abstract clock-time. Indeed, time was one of the main sites of struggle between British and Aboriginal cultures and practices. British authorities tried to integrate Aborigines into the labour force, with mixed results, and this was due to a great extent to the unwillingness of Aborigines to submit to the time-discipline patterns entailed by abstract clock-time: 'certainly, Aborigines did not believe in obedience to the clock. To them, time was not a tyrant'.[153] When Aborigines were employed in capitalist enterprises, they incorporated their own time-reckoning conceptions and traditions in wage-labouring practices. In the face of time regimes imposed by missions and government stations, the Aborigines held on to their own temporal order.

From Donaldson's discussion, it seems possible to infer that market compulsion never quite completely penetrated the strategies of reproduction of Aboriginal peoples. For example, their marginalisation in the labour market made them resort to reproductive strategies based on seasonal labour, which allowed the movement of the Dreaming cycle to continue: 'the fruitfulness of the properties on which they worked was safeguarded by incorporating them into the sequential movement of the group across the country, thereby allowing Aboriginal time to be maintained'.[154] Even in instances of more 'complete' proletarianisation of Aboriginal groups, their temporalities could be maintained, as the example of Nyungars illustrates:

> Nyungar time continued, for the Nyungars were able to retain their close ties with the land and to maintain a collective orientation to wage labour which blurred the distinctions between work and leisure, child and adult tasks and pleasures, and domestic and public production.[155]

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152 Ibid. There is no intention here of idealising or romanticising non-capitalist social time relations. Furthermore, in this case, it needs to be pointed out that these groups were also traversed by class and gender inequalities. For example, 'time was appropriated by the mature males' (Donaldson 1996, p. 195). As such, social time relations in this context are also a 'struggling entity' shaped by social relations with specific tensions, conflicts and logics of power.

153 Donaldson 1996, p. 197.

154 Donaldson 1996, p. 200.

155 Donaldson 1996, p. 201.

Even in the context of the recent changes in agricultural economy such as the destruction of most of the rural jobs performed by Aborigines and the introduction of more and more energy-intensive production techniques, 'Aboriginal conceptions of time survived . . . especially where ties with the land endured'.[156] The struggle for the reassertion of Aboriginal ties to the land is therefore crucial in this regard:

> Australian Aborigines prevented the extinction of their temporal order by their resistance to the white work ethic and by the incorporation into their Dreaming cycle of elements of it which enabled them to remain as close as possible to the land for which they hold spiritual responsibility. They maintained, too, where possible, the collective performance of and a task orientation towards work, and a refusal to separate 'work time' from 'life time'. The movement to the homeland centers and the Land Rights Acts of more recent times seem to have assured the further development of their temporal order by strengthening its relations to the land.[157]

The recent struggles of Aborigines for their land titles can therefore be seen also as an aspect of a process of temporal struggle that has been ongoing since the period of British colonialism.

This latter example also provides an opportunity to specify the following with regards to 'concrete time'. Concrete time exists in all of human history, in all of natural history as a matter of fact. But its shapes and contents are not transhistorical precisely because concrete times can change with different social organisations. Concrete times emanating from the interaction between humans, and natural and social processes, are not always the same, since these interactions change their forms historically. It does not suffice to portray a transhistorical concrete time, which progressively comes under the sway of capitalist abstract time at some point. Capitalist concrete time also differs from pre-capitalist concrete times not least because of the effects that abstract time has on it.[158] Also, pre-capitalist concrete times might have differed and taken specific forms in different and specific societies.

156 Donaldson 1996, p. 202.

157 Donaldson 1996, p. 203. In this passage, Donaldson quotes Murray 1992, p. 14.

158 In the same line of thought, Adam suggests that 'clock-time has not replaced the multiple social, biological and physical sources of time; rather, it has changed the meaning of variable times, temporalities, timings and tempos of bio-cultural origin' (Adam 1995, p. 25).

Capitalist social time relations are composed of two different forms of time – abstract and concrete – which are in a relationship of domination and resistance. Capitalist value formation and appropriation occur via abstract clock-time, and as such capitalism displays a noxious tendency to integrate the concrete times of human lives and the socio-natural world into value relations. Importantly, such a process is not a one-sided sweep of concrete times. The latter remain present for two main reasons: first, as much as capital tends to abstract from the concreteness of human lives and the socio-natural world in order to commodify and 'value' them, it cannot exist without them. Second, concrete times are fundamental to human reproduction, whether in labour, reproduction, everyday life, etc. Concrete times do keep their importance in everyday lives and experiences, and people do relate concretely to time and articulate time references in a way that is meaningful to their concrete experiences. As such, people often resist the imposition of abstract clock-time in the name of their lived concrete experience of time and temporality.

The temporal character of social struggle under capitalism thus points to a process in which capital's temporal order is imposed and resisted to varying degrees. These struggles are articulated along class, gendered and racialised lines. However, even if capitalist time is indeed contested, people, as noted, take capitalist clock-time very much for granted, which might explain why this aspect of capitalist domination, although resisted, is one of the most pervasive and successful systems of social domination and control, and why it is often 'taken to be not only our natural experience of time', but also and even more pervasively 'the ethical measure of our very existence'.[159]

Shedding more theoretical and historical light on the relationship between abstract and concrete times enriches some recent contributions in the literature that focus on the 'multiplicity' of social times. Barbara Adam, one of the most prominent and thoughtful voices in that field, offers work that does recognise the dominance of clock-time, the marginalisation of 'other' times, and the relationship of these processes to commodification. She also gestures toward the irreducibility of concrete times: 'the existence of clock-time, no matter how dominant, does not obliterate the rich sources of local, idiosyncratic and context-dependent time awareness which are rooted in the social and organic rhythms of everyday life'.[160] All of this is correct on its own terms, and her writing is truly among the most thought-provoking and consistent on

159 Nguyen 1992, p. 29.

160 Adam 1995, p. 21.

the matter. She recognises both the aspect of conflict and the totalising tendencies that affect multiple times, as appears in the following quote:

> Artists, carers and people providing services compete on unequal terms with occupational groups whose work is amenable to translation into the clock-time-units. Such inequality turns into a major problem where the principle of commodified time has been politically imposed across the board, irrespective of sustainability: where it has been thrust upon business, education and health services, theatre companies and the visual arts community without regard for their unique temporal complexities, and where valorization is conducted on the basis of commodified time.[161]

Adam grasps, with great acuteness, this dynamic in which practices, labour and occupations are valorised advantageously when their temporalities are amenable to clock-time.[162] However, her rather descriptive account can be supplemented by a more thorough theoretical and historical engagement with the question of the relationship between abstract and concrete time. It is not sufficient in that regard to say with Adam that the 'valorization of speed' differentiates 'commodified' and 'other' times. Such a statement needs more analysis than what Adam gestures to in introducing this argument about speed: 'To be efficient is to produce something or to perform a task in the shortest possible time. To be profitable is to spend as little money as possible on labour-time. To be competitive is to be faster than your rival'.[163] Although she recognises that commodification plays an important role in time relations, Adam does not specify the theoretical and historical connection between clock-time and capitalist value. For example, there is hardly a definition of capitalism, or a historical account of the processes involved and the social relations sustaining such a thing as 'abstraction' or 'commodification'. That might explain why, while her conclusions are truly insightful, she is prone to emphasise multiplicity, instead of interrogating more thoroughly the contentious nature of social time relations.

To explain *why* some times are dominant while others are marginalised, one needs to interrogate the logic of power at work in social time relations. In this sense, capitalist social time relations are better approached as a struggling

161 Adam 1995, p. 101.

162 See also Tombazos 2013, pp. 175–6.

163 Adam 1995, p. 100.

entity in which concrete times tend to be marginalised and alienated *because* of their relationship to the law of value. Concrete times might be formative of use-value and concrete experiences, but capitalist value is characterised by a process of abstraction, itself internally related to abstract time-units, that imposes its logic on capitalist social relations, social life and social time. The fact that 'any time that cannot be accorded a money value is consequently suspect and held in low esteem',[164] ultimately rests on processes of value formation and appropriation in capitalist societies and prevailing power relations that hold sway within them. In order to recognise and make sense of these processes, the focus must not be solely on temporal multiplicity, but must also be directed toward the totalising tendencies of capitalism and of the market logic.[165]

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164 Adam 1995, p. 99.

165 The totalising tendencies of capitalism are, however, absent from Glennie and Thrift's work (1996, 2009) as a result of the limitations of the theoretical lens through which they analyse their empirical findings. A separate article addresses these issues: see Martineau 2015. But let us note already that Tomba's proposition – that socially necessary labour time synchronises different productive temporalities (multiple times) at the level of the global market – is highly pertinent and points in a promising direction (Tomba 2013, pp. xiii–xiv, 144–50).

Conclusion

Time is the room of human development.[1]

The present study has sought to show how time is better conceived of as a social phenomenon, as social time relations, as a process of *becoming* entailed in the relationship between socio-natural human bodies and socially mediated natural cycles and processes. This relationship is historically specific, in the sense that it is mediated by historically specific forms of social organisation, specific forms of social-property relations and conflicts which entail specific and changing forms of institutionalised social power, different levels of development of productive forces, specific forms of social relations of gender, race, class and sexuality, more or less integrated apparatuses of military or political domination, variously integrated and functional religious institutions, different ideological forms, and so on. As such, social time relations are also historically specific.

There are three 'moments' of temporal relationships in any social time relations: a moment made of socio-natural cycles and processes; a moment of human socio-natural bodies; and a moment of social-property and power relations and conflicts, which all produce, comprise and display different times, as well as entail their share of folded temporalities. However, these three 'moments' cannot be thought of as separate entities, which would come into contact as pre-constituted units. From a perspective which treats human social life as a whole in process, these three 'moments' co-constitute each other, that is, personal time, society's time and natural time are aspects of the same cluster of temporal relations. (1) Personal time, the time of human bodies, is made up of social and biological cycles and processes. It comprises, channels and (re)produces processes and synchronisations with the time of nature, and it comprises, channels and (re)produces temporal relations, processes and synchronisations with the time of society. Personal experiences of time are never cut off from the time of nature and the time of society. (2) The time of 'nature' is always already funnelled, channelled, even altered, by bodies and societies through social practical activities, and by the fact that the times of human bodies and the times of social life are integrated within – and increasingly against – the times of natural ecosystems. (3) The time of society, for its part, is made up of the time of human bodies and human practical activities, by the overall cluster of social time relations, and is also shaped and conditioned by natural cycles and processes of change.

1 Marx 1985, p. 142.

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These three apparently separate moments of time ('personal', 'social', and 'human') are thus all part of one and the same time, one and the same *process of becoming*, which, in the socially mediated and 'timed' interaction between human personal time and natural cycles and processes, displays social time relations whose fabric and texture are characterised by multiplicity and struggle, and furthermore are always historically specific. Most of the scholarship on time has treated these three spheres as separate entities and these three times as separate times. However, what is proposed here seeks to unify these times as inseparable aspects of a process of becoming. Importantly, this 'process of becoming' should not be seen as a metaphysical construction, somehow transcending social life. Rather, it is constantly made and remade by social practices considered as an empirical whole. This process of becoming is itself a concrete time made up of the totality of natural, social and human concrete cycles, processes and rhythms of interactions.

This study has underlined the relationship between social-property relations and conflicts and social time relations, understood as a struggling entity. Part of the argument has revolved around a comparative account between pre-capitalist social time relations in Western Europe and capitalist social time relations that were to emerge from changes in the social-property relations in the English countryside, which would eventually spread to other social settings. At least four forms of social time that were part of pre-capitalist social time relations in the Western European context were identified. Conceptions and practices of time of the Church, and conceptions and practices of time of commercial merchants, displayed a temporal form that I have called 'official time', which mixed and blended with forms of concrete temporalities, notably in the urban acoustic landscape of 'bell time'. Processual concrete time, for its part, emerged from (re)productive practices typical of life on the land. Whereas official time in this context strived to dominate and impose its conceptions and practices of time, it was irreducibly met by a form of concrete time, which overwhelmingly permeated the bulk of social (re)productive practices.

The fact that processual concrete time maintains its relatively prominent and independent position in pre-capitalist social time relations in spite of its interaction with official time is related to a feature of pre-capitalist social-property relations that I have called its 'moment of appropriation'. In pre-capitalist societies, the moment of appropriation is not simultaneous to production. Although official time strives to dominate other times, appropriation in pre-capitalist contexts is effectuated in the form of an appropriation occurring after production, or prior to it if considered from the point of view of surplus transfers legally or customarily determined before production. It relies on the alienation of the product of labour, but not

systematically of the 'time of labour'. In capitalist social time relations, however, appropriation is effectuated simultaneously to the process of labour itself, it relies on the relationship between alienated labour and alienated time, on the fusion between human labour and abstract clock-time-units. As such, capitalist clock-time becomes dominant, hegemonic, in capitalist social time relations in a systematic way.

The enquiry furthermore approached the problem of the relationship between processes of value formation and appropriation in capitalist societies and social time forms. There was found to be a fundamental relationship between abstract clock-time and capitalist value, around which was articulated a conception of capitalist time as a struggle between abstract time and concrete times. Through this lens, social conflicts in capitalist settings can be read as conflicts between abstract time and concrete times with class, gender and racial implications. Furthermore, these conflicts are mediated by cultural forms.

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All of this obviously has implications for the concept of history, although a future study shall address that question with more focus. For now it can be said that history should not be conceived of as an abstract time. History is rather a concrete time. In other words, history is not an abstract temporal framework inside which world-making beings live, act and die. Rather it is constantly made and remade by human agency deployed in specific conditions, themselves the product of previous interactions between human agency and the socio-natural world. The suggestion that human historical time has progressively absorbed natural time was made by Marx himself, who noted the paradoxes of such a feat.[2] For one thing, such a thesis should be read as an injunction for humans to preserve and perpetuate the fragile equilibrium between social and natural times, instead of naturalising social time itself as an unreachable and unalterable framework for the reproduction of value, notwithstanding the dire consequences that the time of value has for concrete times. It paradoxically needs to be reminded that the process of becoming of the socio-material world is not divorced from the actions of world-making beings.

If history is itself a product of social practices, and should be considered as a concrete time rather than an abstract framework, does it make sense to use the concept of 'history' in the singular, instead of speaking of 'histories'? This is a broad question, with many layers and levels. I will limit my comments to

2 See Fischbach's brilliant discussion of 'what capitalism does to history' (2011, pp. 87–112).

the following: the singular 'history' might itself very well be 'historical', in the sense that the very possibility to speak of 'history' instead of 'histories' would be a historical product of the development of capitalism and its totalising tendencies, which have unleashed a process of taking over the globe as a whole, making it possible to speak of the unification of multiple histories under one – contradictory – notion of history. This idea, which was expressed at some length by Sartre, did not go unnoticed in Fredric Jameson's penetrating second part to his essay on time and history.[3] His summary of Sartre's point is worth quoting at length here:

> Sartre once observed, to those who like Lévi-Strauss challenged the very idea of history as a single entity of some kind, that this entity is itself historical, that History must itself gradually come into being in the course of history. In the beginning, he tells us, there was no history, or rather, there were many: the local histories of innumerable tribes, the vanishing histories of the peoples without writing or stable collective memories, the autonomous dynamics of states as isolated in space as so many galaxies. A single history begins to come into view only with the destruction of these multiple collective temporalities, with their unification into a single world system. That unification (or totalization) is what we call capitalism, and it is not yet complete in current globalization but will only be completed by universal commodification, by the world market as such.[4]

Even if this account suffers from a somehow undialectical bias – 'history' also entails its share of disjunctive forces – it is possible to relate this idea of the 'historical emergence of history' to the clustering of clock-time, the Gregorian calendar and the Christian era, at the very least at the level of the historicity of a unified temporal system which itself brings about the possibility to speak of a unified 'history'. This only scratches the surface of a very important

3 Jameson discusses some issues related to our overall problem (2009, p. 589). Building on Ricoeur's work, he puts forward a conception of 'Time' as the intersection (in the form of a 'discordant conjunction') of multiple times. While Jameson's brilliant reflections, following Ricoeur, place a lot of emphasis on narrative and 'emplotment' as the locus of such temporal 'intersections', what is brought forward here, by contrast, puts more emphasis on the totalising tendencies found in capitalist processes of value formation and appropriation in order to explore the ways in which such 'intersections' are embedded, built in, so to speak, dynamics of property relations and power relations.

4 Jameson 2009, pp. 587–8.

question that has remained implicit in this study, but that forms the basis for future research: the problem of the historicity of conceptions of time, and of the possibility of history.

⁘

Although I have focused on capitalist abstract clock-time, throughout this study I have kept alive notions of concrete times. I have highlighted the temporal aspect of dynamics of domination and resistance between capitalism's tendency to commodify – and therefore alienate – time, and the concrete times of human lives and socio-natural processes that resist it. Capitalism's drive to commodify and alienate time is relentless, and it is expressed in processes occurring all across the social field. Indeed, the drive toward the privatisation of natural resources can be read as an attempt by capital to abstract the concrete times of socio-natural cycles in order to 'valorise' them, i.e. to integrate these times in the logic of capital accumulation. In such processes of commodification, the complex cluster of useful labour, socio-natural cycles, human bodies and concrete temporal relationships become means to an end: capital accumulation. Privatising water, for example, entails the abstraction from all the concrete socio-natural and human times involved in the relationship between humans and water into a set of quantifiable time-units expressed in value, thus attributing a – capitalist – value to water, not in the aim of satisfying human needs, but in the aim of profit making. Examples such as these with regards to the relationship between humans and a socially mediated nature, between humans and humans, and between humans and their own bodies, illustrate a struggle between capitalism and human lives, of which the temporal dimension deserves more attention from critical scholarship.

⁘

Perhaps we can now propose a solution to the modern paradox of time with which we started this enquiry. Why, in a context where time is measured and organised to such an unprecedented degree, is it experienced by us as the most uncontrollable and alien force? The measuring and organising of time is a social need; it is a fundamental component of the organisation of society and also of the reproduction of the human species. However, under the compulsion of class relations, and today of capitalism, social time relations have been serving the interests of dominant powers, often at the expense of the concrete times of exploited or oppressed groups. The power of capital in modern societies has relied heavily on the development and refinement of the measurement

and organisation of time to an unprecedented degree. The first purpose of this measurement and organisation, however, is to reproduce the power of capital and to increase the power held by the law of value over social relations, not to enhance the potential of humans as world-making and time-making beings. As such, measured and organised time faces us as an alien structure, coordinating value relations instead of facilitating human relations and contributing to human development.

Measured and organised time therefore goes hand in hand with its alienation in our modern temporal order for the simple reason that time is measured and organised not by us, but by capital, not for us, but for capital. Our times are therefore subject to the imperatives of the law of value. Reclaiming human concrete times of emotions, work, social relationships, human bodies, friendships, love, parenting, childhood, laughter, sleep, childbirth, childrearing, food production, art, the concrete time of our ecosystems, and so on, thus forms an integral part of the reclaiming of our lives and our world. The struggle for 'decommodification', to employ a somewhat rebarbative term, also entails a struggle for the decommodification of human and socio-natural concrete times, the end of temporal alienation and of the subjection of human and social lives to the dictates of the capitalist market, capitalist abstract clock-time compulsions and capital accumulation. As such, temporal struggles figure prominently in 'value struggles'[5] over the very forms in which social relations as well as social life are reproduced. From this perspective, humans appear not only as world-making beings, but also as time-making beings, and if we conceive of history as a concrete process of becoming, the reclaiming of the concrete times of human and socio-natural life might also lead to a reclaiming of history and historical time by those who make it.

5 McNally 2009, pp. 72–83.

Bibliography

Abbott, Andrew 2001, *Time Matters: On Theory and Method*, Chicago: University of Chicago Press.

Adam, Barbara 1995, *Timewatch: The Social Analysis of Time*, Cambridge: Polity Press.

——— 1998, *Timescapes of Modernity: The Environment and Invisible Hazards*, London: Routledge.

——— 2004, *Time*, Cambridge: Polity Press.

Alfonso, Isabel 1991, 'Cistercians and Feudalism', *Past and Present*, 133: 3–30.

Althusser, Louis 2005 [1965], *Pour Marx*, Paris: La découverte.

Anderson, Perry 1992, 'The Ends of History', in *A Zone of Engagement*, London: Verso.

Aristotle 1996, *Physics*, Oxford: Oxford University Press.

Augustine 1961, *Confessions*, London: Penguin.

——— 1972, *The City of God*, Harmondsworth: Penguin.

Aveni, Anthony 2002, *Empires of Time: Calendars, Clocks and Cultures*, Revised edition, Boulder: University Press of Colorado.

Bakhtin, Mikhail 1984 [1965], *Rabelais and His World*, Bloomington: Indiana University Press.

Bakker, Isabella & Stephen Gill (eds.) 2003, *Power, Production and Social Reproduction*, London/New York: Macmillan-Palgrave.

Bannerji, Himani 1995, *Thinking Through: Essays on Feminism, Marxism and Anti-Racism*, Toronto: Women's Press.

——— 2005, 'Building from Marx: Reflections on Class and Race', *Social Justice*, 32(4), 144–160.

Bartky, Ian R. 1989, 'The Adoption of Standard Time', *Technology and Culture*, 30(1): 25–56.

Beaud, Michel 2001, *A History of Capitalism, 1500–2000*, New York: Monthly Review Press.

Benjamin, Walter 2000, *Oeuvres III*, Paris: Gallimard.

Benston, Margaret 1969, 'The Political Economy of Women's Liberation', *Monthly Review*, 21(4): 13–27.

Bloch, Marc 1989, *La société féodale*, Paris: Albin Michel.

Birth, Kevin K. 1996, 'Trinidadian Times: Temporal Dependency and Temporal Flexibility on the Margins of Industrial Capitalism', *Anthropological Quarterly*, 69(2): 79–89.

Bourdieu, Pierre 1972, *Esquisse d'une théorie de la pratique, précédé de trois études d'ethnologie Kabyle*, Paris/Genève: Droz.

——— 1977, *Algérie 60, structures économiques et structures temporelles*, Paris: Minuit.

——— 1980, *Le sens pratique*, Paris: Minuit.

Brandon, S.G.F. 1965, *History, Time and Deity*, New York: Barnes and Noble.

Braverman, Harry 1974, *Labor and Monopoly Capital*, New York: Monthly Review Press.

Brenner, Robert 1985a, 'Agrarian Class Structure and Economic Development in Pre-Industrial Europe', in *The Brenner Debate*, edited by T.H. Alston & C.H.E. Philpin, Cambridge: Cambridge University Press.

——— 1985b, 'The Agrarian Roots of European Capitalism', in *The Brenner Debate*, edited by T.H. Alston & C.H.E. Philpin, Cambridge: Cambridge University Press.

Brubaker, Sarah Jane & Heather Dillaway 2009, 'Medicalization, Natural Childbirth and Birthing Experiences', *Sociology Compass*, 3(1): 31–48.

Cahill, Heather A. 2001, 'Male Appropriation and Medicalization of Childbirth: An Historical Analysis', *Journal of Advanced Nursing*, 33(3): 334–42.

Castree, Noel 2009, 'The Spatio-temporality of Capitalism', *Time and Society*, 18(1): 26–61.

Charleton, Walter 1966 [1654], *Physiologia Epicuro-Gassendo-Charltoniana: or a Fabrick of Science Natural Upon the Hypothesis of Atoms*, London: Tho. Newcomb. Reprinted with indices and introduction by Robert Hugh Kargon, New York: Johnson Reprint Corporation.

Christian, David 2004, *Maps of Time: An Introduction to Big History*, Berkeley: University of California Press.

Clarke, Simon 1982, *Marx, Marginalism and Modern Sociology*, London: Macmillan Press.

Comninel, George 1987, *Rethinking the French Revolution: Marxism and the Revisionist Challenge*, London: Verso.

——— 2000a, 'English Feudalism and the Origins of Capitalism', *Journal of Peasant Studies*, 27(4): 1–53.

——— 2000b, 'Marx's Context', *History of Political Thought*, 21(3): 467–83.

——— 2012, 'Feudalism', in *The Elgar Companion to Marxist Economics*, edited by Ben Fine and Alfredo Saad-Filho, Cheltenham: Edward Elgar Publishing.

Conrad, Peter 1992, 'Medicalization and Social Control', *Annual Review of Sociology*, 18: 209–32.

——— 2007, *The Medicalization of Society*, Baltimore: John Hopkins University Press.

Crary, Jonathan 2013, *24/7: Late Capitalism and the Ends of Sleep*, London: Verso.

Dalla Costa, Mariarosa & Selma James (eds.) 1972, *The Power of Women and the Subversion of the Community*, Bristol: Falling Wall Press.

Davies, Karen 1990, *Women and Time: Weaving the Strands of Everyday Life*, Aldershot: Avebury.

——— 1994, 'The tension between process time and clock-time in care-work: the example of day nurseries', *Time & Society*, 3: 277–304.

DiSalle, Robert 2006, *Understanding Space-Time: The Philosophical Development of Physics from Newton to Einstein*, Cambridge: Cambridge University Press.

Dohrn-van Rossum, Gerhard 1996, *History of the Hour: Clocks and Modern Temporal Orders*, Chicago: University of Chicago Press.

Dolev, Yuval 2007, *Time and Realism: Metaphysical and Antimetaphysical Perspectives*, Cambridge, MA: MIT Press.

Donaldson, Mike 1996, 'The End of Time? Aboriginal Temporality and the British Invasion of Australia', *Time and Society*, 5(2): 187–207.

Dufour, Frédérick Guillaume 2004, 'Historical Sociology and the Concept of Social-Property Relations', *Cahiers d'épistémologie*, 315, ISBN: 2-89449-115-8.

Dufour, Frédérick Guillaume and Frantz Gheller 2013, 'Moishe Postone', in *Marxisme anglo-saxon, figures contemporaines*, edited by Jonathan Martineau, Montréal: Lux.

Dufour, Frédérick Guillaume and Sébastien Rioux 2008, 'La sociologie historique de la théorie des relations sociales de propriété', *Actuel Marx*, 43: 126–39.

Durkheim, Émile 2007 [1912], *Les formes élémentaires de la vie religieuse*, Paris: CNRS.

Einstein, Albert 2010 [1916], *Relativity: The Special and General Theory*, La Vergne: BN Publishing.

Einstein, Albert and Leopold Infeld 1966 [1938], *The Evolution of Physics*, New York: Simon and Schuster.

Elias, Norbert 1992, *Time: An Essay*, Oxford: Blackwell.

Engels, Friedrich 1988 [1843], 'Outlines of a Critique of Political Economy', in *Economic and Philosophic Manuscripts of 1844*, by Karl Marx, New York: Prometheus.

Falk, Dan 2008, *In Search of Time*, Toronto: McClelland and Stewart Ltd.

Ferguson, Sue 2008, 'Canadian Contributions to Social Reproduction Feminism, Race and Embodied Labor', *Race, Gender and Class*, 15(1–2): 42–57.

Ferguson, Sue, and David McNally 2014, 'Capital, Labour-Power and Gender-Relations: Introduction to the Historical Materialism Edition of Marxism and the Oppression of Women', in Vogel, *Marxism and the Oppression of Women*, Chicago: Haymarket.

Fine, Ben and Alfredo Saad-Filho 2004, *Marx's Capital*, London: Pluto Press.

Fischbach, Franck 2011, *La privation de monde: Temps, espace et capital*, Paris: Vrin.

Fox, Bonnie and Diana Worts 1999, 'Revisiting the Critique of Medicalized Childbirth', *Gender and Society*, 13(3): 326–46.

Fraser, Julius Thomas 1999, *Time, Conflict and Human Values*, Chicago: University of Illinois Press.

Giddens, Anthony 1979, *Central Problems in Social Theory: Action, Structure and Contradiction in Social Analysis*, London: Macmillan.

——— 1981, *A Contemporary Critique of Historical Materialism*, Berkeley: University of California Press.

——— 1984, *The Constitution of Society: Outline of the Theory of Structuration*, Cambridge: Polity Press.

Glennie, Paul and Nigel Thrift 1996, 'Reworking E.P. Thompson's "Time, Work-Discipline and Industrial Capitalism" ', *Time and Society*, 5(3): 275–99.

——— 2009, *Shaping the Day: A History of Timekeeping in England and Wales 1300–1800*, Oxford: Oxford University Press.

Goody, Jack 2006, *The Theft of History*, Cambridge: Cambridge University Press.

Gupta, Akhil 1992, 'The Reincarnation of Souls and the Rebirth of Commodities: Representations of Time in "East" and "West" ', *Cultural Critique*, 22: 187–211.

Hannah, Robert 2009, *Time in Antiquity*, London: Routledge.

Harvey, David 1990, 'Between Space and Time: Reflections on the Geographical Imagination', *Annals of the Association of American Geographers*, 80(3): 418–34.

——— 2006, *The Limits to Capital*, London: Verso.

Hassan, Robert 2009, *Empires of Speed: Time and the Acceleration of Politics and Society*, Leiden: Brill.

Hessen, Boris 2009, 'The Social and Economic Roots of Newton's *Principia*', in *The Social and Economic Roots of the Scientific Revolution*, edited by Gideon Freudenthal and Peter McLaughlin, Boston: Springer.

Hilton, Rodney 1985a, 'A Crisis of Feudalism', in *The Brenner Debate*, edited by T.H. Alston and C.H.E. Philpin, Cambridge: Cambridge University Press.

——— 1985b, 'Medieval Market Towns and Simple Commodity Production', *Past and Present*, 109: 3–23.

Husserl Edmund 1970 [1936], *The Crisis of European Sciences and Transcendental Phenomenology*, Evanston: Northwestern University Press.

Jameson, Fredric 2009, 'The Valences of History', in *Valences of the Dialectic*, London: Verso.

Kant, Immanuel 1944 [1781], *Critique de la raison pure*, Paris: PUF.

Kennedy, Geoff 2008, *Diggers, Levelers, and Agrarian Capitalism: Radical Political Thought in Seventeenth Century England*, Lanham: Lexington Books.

Kern, Stephen 1983, *The Culture of Time and Space, 1880–1918*, Cambridge, MA: Harvard University Press.

Kohout Lawrence, Rachel V. 2008, 'Foreword', in *The Essence of Christianity*, by Ludwig Feuerbach, Walnut: MSAC Philosophy Group.

Knafo, Samuel 2013, *The Making of Modern Finance: Liberal Governance and the Gold Standard*, Abingdon: Routledge.

Lachmann, Richard 1987, *From Manor to Market: Structural Change in England, 1536–1640*, Madison: University of Wisconsin Press.

Landes, David 1983, *Revolution in Time: Clocks and the Making of the Modern World*, Cambridge, MA: Harvard University Press.

Lebowitz, Michael 2003, *Beyond Capital: Marx's Political Economy of the Working Class*, London: Palgrave Macmillan.

Leccardi, Carmen 1996, 'Rethinking Social Time: Feminist Perspectives', *Time and Society*, 5(2): 169–86.

Le Goff, Jacques 1977, *Pour un autre Moyen-âge, temps, travail et culture au Moyen-âge*, Paris: Gallimard.

Lie, Orlanda S.H. 2004, 'The Concept of Time in the Medieval World View', in *Janus at the Millennium*, edited by Thomas F. Shannon and Johan P. Snappe, Lanham, MD: University Press of America.

Luhmann, Niklas 1976, 'The Future Cannot Begin: Temporal Structures in Modern Society', *Social Research*, 43: 130–52.

Lukács, Georg 1971 [1923], *History and Class Consciousness: Studies in Marxist Dialectics*, Cambridge, MA: MIT Press.

Martineau, Jonathan (ed.) 2013, *Marxisme anglo-saxon: Figures contemporaines*, Montréal: Lux.

——— 2013, 'Introduction', in *Marxisme anglo-saxon: Figures contemporaines*, Montréal: Lux.

——— 2015, 'Making Sense of the History of Clock-Time. Reflections on Glennie and Thrift's Shaping the Day', *Time and Society*, DOI: 10.1177/0961463X15577281.

Marx, Karl 1973 [1939], *Grundrisse*, Harmondsworth: Penguin.

——— 1976 [1867], *Capital*, Volume I, London: Penguin.

——— 1978 [1885], *Capital*, Volume II, London: Penguin.

——— 1981 [1894], *Capital*, Volume III, London: Penguin.

——— 1985 [1865], 'Value, Price and Profit', in *Marx and Engels Collected Works*, Volume 20, London: Lawrence & Wishart.

——— 1988 [1844], *Economic and Philosophic Manuscripts of 1844*, Amherst: Prometheus.

——— 2009 [1847], *The Poverty of Philosophy*, La Vergne: General Books.

Marx, Karl and Friedrich Engels 1998 [1932], *The German Ideology*, Amherst: Prometheus.

McNally, David 1988, *Political Economy and The Rise of Capitalism: A Reinterpretation*, Berkeley: University of California Press.

——— 1993, *Against the Market: Political Economy, Market Socialism and the Marxist Critique*, London: Verso.

——— 2001, *Bodies of Meaning: Studies in Labor, Language and Liberation*, Albany: SUNY Press.

——— 2004a, 'Language, Praxis and Dialectics: Reply to Collins', *Historical Materialism*, 12(2): 149–67.

——— 2004b, 'The Dual Form of Labour in Capitalist Society and the Struggle over Meaning: Comments on Postone', *Historical Materialism*, 12(3): 189–208.

——— 2009, 'From Financial Crisis to World-Slump: Accumulation, Financialisation and the Global Slowdown', *Historical Materialism*, 17(2): 35–83.

Mead, George H. 1934, *Mind, Self, and Society*, Chicago: University of Chicago Press.

Mészáros, István 2010, *Social Structure and Forms of Consciousness, Volume I: The Social Determination of Method*, New York: Monthly Review Press.

Miller, W.W. 2000, 'Durkheimian Time', *Time and Society*, 9(1): 5–20.

Mumford, Lewis 1967, *Technics and Civilisation*, London: Routledge & Kegan Paul.

Needham, Joseph 1981, *Science in Traditional China: A Comparative Perspective*, Cambridge, MA: Harvard University Press.

Newton, Isaac 1995 [1687], *The Principia*, Amherst: Prometheus.

——— 2003 [1704], *Opticks*, Amherst: Prometheus.

——— 2010 [1687], *The Principia*: *The Mathematical Principles of Natural Philosophy*, La Vergne: Snowball.

Nguyen, Dan Thu 1992, 'The Spatialisation of Metric Time: The Conquest of Land and Labour in Europe and the United States', *Time and Society*, 1(1): 29–50.

Nishimoto, Ikuko 1997, 'The "Civilisation" of Time: Japan and the Adoption of the Western Time System', *Time and Society*, 6(2): 237–59.

Ollman, Bertell 1976, *Alienation: Marx's Conception of Man in Capitalist Society*, Cambridge: Cambridge University Press.

——— 2003, *Dance of the Dialectic: Steps in Marx's Method*, Urbana: University of Illinois Press.

Osborne, Peter 1994, 'The Politics of Time', *Radical Philosophy*, 68: 3–9.

——— 1996, *The Politics of Time*, New York: Verso.

——— 2008, 'Marx and the Philosophy of Time', *Radical Philosophy*, 147: 15–22.

Penn, Simon A.C. and Christopher Dyer 1990, 'Wages and Earnings in Late Medieval England: Evidence from the Enforcement of the Labour Laws', *Economic History Review*, New Series, 43(3): 356–76.

Penrose, Roger 2004, *The Road to Reality*, London: Jonathan Cape.

Post, Charles 2012, *The American Road to Capitalism*, Chicago: Haymarket.

Postan, Michael 1975, *The Medieval Economy and Society*, London: Penguin.

Postone, Moishe 1993, *Time, Labor and Social Domination*, Cambridge: Cambridge University Press.

Quinones, Ricardo J. 1972, *The Renaissance Discovery of Time*, Cambridge: Harvard University Press.

Renouard, Yves 2009, *Les hommes d'affaires italiens du Moyen Âge*, Paris: Tallandier.

Ricoeur, Paul 1983, *Temps et récit I*, Paris: Seuil.

——— 1984, *Temps et récit II*, Paris: Seuil.

——— 1985, *Temps et récit III*, Paris: Seuil.

Rifkin, Jeremy 1987, *Time Wars: The Primary Conflict in Human History*, New York: Simon and Schuster.

Rioux, Sébastien 2013, 'David Harvey', in *Marxisme anglo-saxon, figures contemporaines*, edited by Jonathan Martineau, Montréal: Lux.

Rynasiewicz, Robert 1995, 'By Their Properties, Causes and Effects: Newton's Scholium on Time, Space, Place and Motion', *Studies in History and Philosophy of Science*, 26: 133–321.

Schütz, Alfred 1971, *The Problem of Social Reality*, The Hague: Martinus Nijhoff.

Serres, Michel and Bruno Latour 1995, *Conversations on Science, Culture and Time*, Ann Arbour: University of Michigan Press.

Sewell, William H. Jr. 2008, 'The Temporalities of Capitalism', *Socio-Economic Review*, 6: 517–37.

Smith, Thomas C. 1986, 'Peasant Time and Factory Time in Japan', *Past and Present*, 111: 165–97.

Sorokin, Pitirim 1964, *Sociocultural Causality, Space, Time*, New York: Russell and Russell.

Teschke, Benno 2003, *The Myth of 1648*, London: Verso.

Thomas, Keith 1964, 'Work and Leisure', *Past and Present*, 29: 50–66.

Thompson, E.P. 1993, 'Time, Work-Discipline and Industrial Capitalism', in *Customs in Common*, New York: New Press.

——— 1995 [1978], *The Poverty of Theory*, London: Merlin.

Tilly, Charles 2000, 'La guerre et la construction de l'État en tant que crime organisé', *Politix*, 13(49): 97–117.

Tomba, Massimiliano 2013, *Marx's Temporalities*, Leiden: Brill.

Tombazos, Stavros 2013, *Time in Marx. The Categories of Time in Marx's Capital*, Leiden: Brill.

Vogel, Lise 2014, *Marxism and the Oppression of Women: Towards a Unitary Theory*, Chicago: Haymarket.

Weatherill, Lorna 1988, *Consumer Behaviour and Material Culture in Britain 1660–1760*, London: Routledge.

Weber, Max 1964 [1905], *L'éthique protestante et l'esprit du capitalisme*, Paris: Plon.

Whitrow, G.J. 1987, *Time in History*, Oxford: Oxford University Press.

Williams, Raymond 1977, *Marxism and Literature*, Oxford: Oxford University Press.

Wood, Ellen Meiksins 1995, *Democracy Against Capitalism*, Cambridge: Cambridge University Press.

——— 2002a, *The Origin of Capitalism*, London: Verso.

——— 2002b, 'The Question of Market-Dependence', *Journal of Agrarian Change*, 2(1): 50–87.

——— 2005, *Empire of Capital*, London: Verso.

——— 2008, *Citizens to Lord*, London: Verso.

——— 2012, *Liberty and Property*, London: Verso.

Wood, Neal 1978, 'The Social History of Political Theory', *Political Theory*, 6(3): 345–67.

——— 1984, *John Locke and Agrarian Capitalism*, Berkeley: University of California Press.

——— 1988, *Cicero's Social and Political Thought*, Berkeley: University of California Press.

——— 2002, *Reflections on Political Theory: A Voice of Reason from the Past*, Basingstoke: Palgrave.

Wood, Neal and Ellen Meiksins Wood 1978, *Class Ideology and Ancient Political Theory*, New York: Oxford University Press.

Zerubavel, Eviatar 1981, *Hidden Rhythms: Schedules and Calendars in Social Life*, Chicago: University of Chicago Press.

——— 1982, 'The Standardization of Time: A Sociohistorical Perspective', *American Journal of Sociology*, 88(1): 1–23.

——— 1985, *The Seven Day Circle: The History and Meaning of the Week*, Chicago: University of Chicago Press.

Zmolek, Mike 2000, 'The Case for Agrarian Capitalism: A Response to Albritton', *Journal of Peasant Studies*, 27(4): 138–59.

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