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The Experience of Temporal Passage

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Thèse de doctorat ès lettres

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the degree of Ph.D.

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Abstract

In this thesis I analyse the notion of temporal passage and whether we could infer that time passes from experience. The thesis is divided into two parts.

The first part is the metaphysical part, which provides the basis for what I argue in the second part. I argue that McTaggart's paradox against the coherence of temporal passage is based upon and requires a view of time according to which all times exist (A-eternalism), and where temporal passage is conceived as relational change of terms in the time-series with regards to past-, present- and future- properties (A-properties). I provide a limited defence of the paradox within the framework of McTaggart's understanding of time and temporal passage. I then claim that if we understand temporal passage differently, namely as coming into existence *simpliciter* and going out of existence *simpliciter*, or absolute becoming, then the paradox can be avoided. I show that this view is best accommodated by presentism, the view that only the present exists. The conclusion of part one is that temporal passage should be understood as absolute becoming of times within a presentist framework.

In the second part of the thesis I argue against a frequently found (but rarely explicitly analysed) argument, which states that we can infer from the experience of temporal passage that time really passes, because the fact that time passes is the best explanation for having experiences of temporal passage. I argue that the argument fails because we either cannot experience temporal passage at all, or not in a way that allows us to infer that time passes from experience. I begin by discussing different types of experiences that one might confuse with experiences of temporal passage. I then argue that the only experience that could be best explained by the fact that time passes would be a perceptual experience of events undergoing absolute becoming. I then assess the claim that we can perceptually experience the absolute becoming of events, or A-change, in the light of three major accounts of temporal perception: the memory theory, the retentional theory and the extensional theory. I argue that memory based accounts do not allow for experiences of A-change because they deny that we can have perceptual experiences of change in general. The retentional theory does not allow for experiences of A-change *as* A-change. Hence, given the retentional theory of temporal perception, we cannot infer that time

passes from experience. The problem with the extensional theory of temporal perception is that it is metaphysically incompatible with presentism and therefore with absolute becoming. I explore two non-standard forms of presentism that are, *prima facie*, compatible with the extensional theory, 'Compound Presentism' and 'Simple Presentism'. Compound Presentism turns out to be incoherent. The extensional theory and Simple Presentism might be compatible, but the combination of these views would not allow us to perceptually represent absolute becoming either. In the last section I defend my argument against two objections, one involving 'high level properties', and one involving 'present-as-absent' representation in experience. I conclude that we cannot infer from experience that time passes.

PART I: THE METAPHYSICS OF TEMPORAL PASSAGE

Introduction

Time, it seems to us, passes, flows, flies or crawls. Hours pass, days end, months change, years go by. Few things seem so sure to us in everyday life as the continuous passage of time. Philosophy, however, is notorious for doubting what we are most certain of. It is not surprising then that even an idea as deep-rooted and intuitively plausible as the idea of time's passage has been long and heatedly debated. There are many questions that relate to the controversy. Is temporal passage a coherent notion? If so, what exactly constitutes it? Does time really pass? That is, is the passage of time an objective feature of reality, independent from our perspective as conscious beings on the world? Or is it something that we project onto the world? Do we really experience time's passage? What does it mean to say that we experience the passage of time?

Broadly construed, the subject of this thesis is the passage of time. Of all the issues, questions and problems that relate to this vast topic, I can only hope to address a few. I will focus on four of the questions mentioned:

- (i) Is temporal passage a coherent notion?
- (ii) If so, then what does temporal passage consist in?
- (iii) What does it mean to say that we experience temporal passage?
- (iv) Do we really experience time's passage?

I will not answer in this thesis whether or not time passes. Instead, I will give two arguments, which will give us a better handle on that question. Firstly, I argue that the notion of time's passage is coherent, provided we understand it adequately. Secondly, I argue, against wide spread opinion to the contrary, that we *cannot* experience temporal passage. More precisely, I claim that we cannot be aware of passage in any perceptual way. As a consequence, I think that dynamic theories of time, which defend the idea that time passes, are far less intuitive than they claim to

be. This is not to say that time is static. But if we were really to think that time passes, we ought to find arguments that do not draw on experience.

The thesis is divided into two parts. The first part is the metaphysical part which focuses on questions (i) and (ii), that is, on whether temporal passage is a coherent notion and if so, how it should be analysed. Here I am mainly concerned to explicate and analyse McTaggart's argument to the effect that temporal passage is incoherent. I reconstruct McTaggart's famous 'paradox of temporal passage' (1908; 1927). I argue that it succeeds, assuming an eternalist A-theory of time, that is, a view according to which all times exist and temporal passage is a change in terms of pastness, presentness and futurity. However, if we reject this view of time and understand temporal passage as a change of what exists (rather than a change in terms of certain properties), then the paradox can be avoided. I will determine a precise way for temporal passage to be understood in order for it to be a coherent notion. I then argue that this particular understanding of temporal passage can be best accommodated by presentism, the view that only the present (what is present) exists.

The second part of the thesis is concerned with questions (iii) and (iv), that is, with the (alleged) perceptual experience of temporal passage. More precisely, I will argue against a frequently found (but rarely explicitly analysed) argument, which I call with Le Poidevin (2007) 'the Argument from Experience' (AfE).¹ AfE is, briefly put, the argument that we all constantly experience temporal passage and that the best explanation for these experiences is that time really passes. With an inference to the best explanation the argument concludes that time really passes. I argue that the best way to refute AfE is not to say that our experiences of passage are illusory, but that we cannot have these experiences in the first place. To correctly assess AfE I shall examine the claim that we experience passage in the light of different major accounts of temporal perception. I determine what the content of an experience of temporal passage would have to be in order for AfE to work. I shall then show that none of the major accounts of temporal perception can account for such an experience.

Part one and part two are importantly related. If temporal passage was incoherent, then we could not infer that time passes from experience, for then even if we had experiences of passage,

¹ My version of the Argument from Experience differs from Le Poidevin's (cf. chapter 6).

those experiences would have to be illusory and AfE necessarily invalid. Thus without having established in part one that temporal passage is possible at all, it would make no sense to assess AfE in part two. The way I define temporal passage in part one is also vitally important for my argument in part two, for it helps me to determine what we would have to experience, in order to have experiences of temporal passage.

The conclusion of this thesis is twofold. Firstly, I conclude that temporal passage, understood as times coming into existence and ceasing to exist, is possible. Secondly, I conclude that we do not have any perceptual access to temporal passage for we cannot experientially represent temporal passage in a way that allows us to infer that time passes from experience.

Chapter One: Dynamic and Static Theories of Time

The aim of the first chapter is to introduce the divide between static theories, which reject the passage of time, and dynamic theories, which defend it. More often than not we find the debate about the passage of time conflated with other issues. I will show that it is a subject that ought to be distinguished from others. I will also show that accounts of temporal passage can standardly be sorted into two kinds. Along the way I clarify some terminological issues.

The first section of the chapter sets up the distinction between dynamic and static theories of time. In the second section, I will introduce the standard terminology used in the metaphysics of time. The section concentrates especially on McTaggart's 'A- and B-series of time' and illuminates the way McTaggart understands temporal passage and the relation between the A- and B-theory (1908; 1927). In section three I explain further more general terminological issues that will be relevant for the remainder of the thesis. In section four I aim to disentangle the most prominent debates in the metaphysics of time. I argue that the debate about temporal passage is often wrongly conflated with other debates. In the last section I give a brief overview of contemporary accounts of temporal passage.

In chapters two and three I will explicate McTaggart's famous argument for the unreality of time and the incoherence of temporal passage. I will argue, contra McTaggart, that passage is coherent, but only if we take a particular view of what it is for time to pass.

1.1 The divide between dynamic and static theories

One way to characterize debates in the metaphysics of time is to distinguish between so called '*dynamic*' accounts of time, which hold that time really does pass, in the sense that temporal passage is an objective feature of reality, and '*static*' accounts which deny this (cf. Dainton 2001). A first intuitive characterisation of what we mean when we talk about temporal passage could be given as follows:

What is future will be present, what is present will be past and what is past was once present.

Temporal passage, thus understood, is a change with regard to what is future, present and past: nothing can be always future, or always present, or always have been past. The description above gives an intuitive idea about what the debate is concerned with — we shall later see that not all theorists of temporal passage are entirely happy with it. For now it suffices to say that different dynamic theories give different accounts of temporal passage. Some understand it in terms of a ‘moving present’, where presentness is understood as a property that is successively acquired and lost by different times. Others define temporal passage as the coming into existence of future times, and sometimes also as the ceasing of times that become past. Static accounts of time standardly reject the idea that time passes, no matter how passage is characterised, though they usually do not deny that we experience time *as* passing.¹ Time, on their view, is a fixed, static dimension. It does not flow, just as space does not flow. Here is a first rough distinction between static and dynamic accounts:

Dynamic theories defend temporal passage as a mind-independent, objective feature of reality.

Static theories think of temporal passage as psychological phenomenon, as a way of thinking about the world. They deny that there is something in reality that corresponds to the concept of temporal passage.

I have outlined a first idea about what this thesis will be concerned with: the debate about the nature and reality of temporal passage. In the next section I shall introduce the ‘A-series’ and ‘B-series’ of time, and the terminological and conceptual framework of the debate to the present day. The section also illuminates McTaggart’s assumptions about time and temporal passage and the way in which, for him, the A-series and the B-series relate to each other.

¹ One notable exception is Prosser, who rejects the idea that we can have perceptual experiences as of passage (2007, forthcoming).

1.2 The A-series and the B-series of time

Before I can say more about the contrast between static and dynamic accounts, it is prudent to introduce the terminological framework. To the present day, the terminology used in the metaphysics of time is largely due to McTaggart (1908; 1927). McTaggart distinguishes two ways we conceive of time, which correspond to two kinds of temporal ordering. The first is an ordering with respect to certain properties, properties of being past, present or future that we predicate of events and moments (times). We say for example that the Second World War occurred in the past, that the next American election will take place at some point in the future, and that it is now eight o’clock. According to McTaggart, this ordering constitutes a time-series, which he calls the ‘A-series’. The properties of pastness, presentness and futurity, standardly referred to as ‘A-properties’ or ‘tensed properties’, are supposed to be mutually exclusive, so that what is present cannot be past or future, what is future cannot be past or present, and what is past cannot be present or future. Pastness and futurity come in different degrees. If my dinner tonight will take place two hours hence and my doctoral appointment will be tomorrow, then my dinner is ‘less future’ (or ‘future to a lesser degree’) than my doctoral appointment. Caesar’s crossing the Rubicon is ‘more past’ than the death of Marie Antoinette. Different degrees of pastness or futurity are also mutually exclusive. Some event occurred either two days ago *or* three days ago, but not both, two days ago *and* three days ago. Analogously, some particular event will either take place two days hence or three days hence, but not two days hence *and* three days hence. In other words, pastness and futurity come in various specific or determinate degrees, which is why A-properties are also called *A-determinations* in the literature. Presentness, on the other hand, does not come in degrees. Things cannot be more or less present — either something occurs now, or it does not. The reason is that the present is standardly taken to be a moment without duration. If the present (or what is present) has no duration, then it cannot have different degrees of presentness — a moment that has no duration does not allow for temporal variation. Nor can anything that is completely located in the present vary in degrees of presentness. The idea that the present has no duration goes back to an argument by St. Augustine (1991). St. Augustine thought that if the present had duration, then it would be true to say that the first part of the present is earlier than the second part of the present. But whatever is

earlier or later than what is present, cannot itself be present. Therefore, he thought the present must be instantaneous.²

There is, however, something more to be said because we do seem to predicate presentness of items with various temporal lengths; one might for example say ‘our century is the present century’ and at the same time hold that Obama’s inauguration occurred in the past even though it is part of the present century. So, does the present include Obama’s inauguration or not? Mellor (1998) attempts to clarify this point by distinguishing what he calls the ‘*A-scale*’, an ordering of *times* with A-properties (‘*A-times*’), and the *A-series*, which he understands as the ordering of *events* located at those times. The Mellorian A-series and A-scale are related in that events ‘have’ A-times, namely the A-times they span within the A-scale (the Second World War for example has an A-time of 6 past years). In this framework, A-times include ‘A-moments’ (moments with A-properties) as well as intervals. According to Mellor’s terminology, an interval is present when it includes the present moment, past when it only includes moments earlier than the present moment, and future when it includes only moments later than the present moment. An event’s A-time, for Mellor, is the minimal time span it occupies on the A-scale. Thus Obama’s inauguration is past, because the minimal time span it occupies includes only moments that are earlier than the present moment, although it is part of the century that is present by virtue of spanning an A-time that includes the present moment. To make things not unnecessarily complicated, I will refrain from using Mellor’s distinction. Instead, I will distinguish between a strict metaphysical sense in which something is present and a loose colloquial sense. According to me, the present century is only present in the loose sense, whereas Obama’s inauguration is not present at all, neither in the loose nor in the strict sense. ‘Strictly present’ is to be ‘wholly present’, that is, to have no part such that it is not located at the present time. Present in the loose sense is to have at least one proper part that is located at the present time. Unless otherwise indicated, I adopt the standard view and predicate presentness only of instantaneous entities.

According to McTaggart, we also conceive of time as an ordering of events and moments in terms of earlier-than, later-than and simultaneous-with relations, similar to the order displayed by a calendar. We speak for example of the 12th of May 2012 as being *before* the 13th of May 2012, of

² I will come back to St. Augustine’s argument in chapter 8.5.

this year’s Christmas taking place *after* this year’s Halloween, and of the cinema showing two films *at the same time*. McTaggart calls this ordering the ‘*B-series*.’ The B-series is such that any two events are either simultaneous or successive and events that are simultaneous with each other have the same position in time. Succession is an asymmetric relation: if x and y are successive events, then, if x is earlier (later) than y, then it is not the case that y is earlier (later) than x. Note that simultaneity for moments (but not events) is just identity.

McTaggart thought the B-series is a *static* series, because if one item x in the B-series is before (or after) another item y in the B-series, then it is *always* (at all times) the case that x is before (or after) y. The fact that x is before (or after) y never changes. Analogously, when x is simultaneous to y, then x is *always* simultaneous to y (cf. McTaggart 1927). Consider the calendar: if the 12th of May 2012 is before the 13th of May 2012, then it is *always* the case that the 12th of May 2012 is before the 13th of May 2012. For this reason McTaggart held that there can never be change within the B-series.

The A-series, on the other hand, essentially changes. Items in the A-series change because there is only ever one moment that is present — but *which* moment is present changes as time goes by. A moment that is present becomes past, as a future moment becomes present. Past moments become *more* past and future moments *less* future. In the A-series, every single term (event, moment) continuously changes with regards to its A-properties, successively taking on different A-determinates from various degrees of futurity to being present to various degrees of pastness (cf. McTaggart 1927). This change constitutes for McTaggart temporal passage. McTaggart’s A-series is a *dynamic* series.

Temporal relations between times and events are also distinguished into *A-relations* and *B-relations*. A-relations are relations that hold between any moment or event in the A-series and the present (the time that is present), such as for example ‘one week ago’, the ‘previous month’, or ‘one year from now’. Which specific relation the terms instantiate depends on their distance to the present. ‘One week ago’, for example, is a relation that is instantiated between the present and any event or time that is seven days past. More generally we can say that A-relations are relations such as ‘n days (time-units) ago’ or ‘n days (time-units) hence’ from the present. They

are determined by the metric distance that each term has from the present.³ B-relations are relations such as ‘two days before’, ‘one year later’ or ‘at the same time’. The key difference between the two types of relation is that A-relations always hold between a term (a time or an event) and the *present time*. B-relations, on the other hand, hold between a term and another *contextually provided* term (time of utterance or reference date). This is because the A-series, but not the B-series, includes a time that is present. Terms in the B-series do not have A-properties. A calendar can tell us which day comes before the other, but it cannot tell us which day is today. If it is now three o’clock, and I had lunch at two, then I can either say that I had lunch one hour ago, meaning one hour from the present, or I can say that I had lunch one hour earlier, meaning one hour earlier than my utterance. Sentences that mention some present time, as in ‘it is now three o’clock’ are analysed B-theoretically by determining the present time as the time that is simultaneous with my utterance. Similarly, ‘is past’ is analysed as ‘being earlier than my utterance’ and ‘is future’ as ‘being later than my utterance’. In short, the difference between A- and B-relations is one that is based upon the existence or non-existence of an *objective and irreducible* property of being present that is essential to the A-series, but not constitutive of the B-series. What does it mean to say that a time is ‘objectively’ and irreducibly’ present? For a McTaggartian it means that presentness, the property of being present or ‘now’, cannot be reduced to any B-theoretic notion and is always instantiated by exactly one time, independent from any context or standpoint of evaluation. Opposed to that, each term within the B-series is present when it exists (occurs). That is to say that any B-time t_b is present at t_i (which is just another way to say that $t_i = t_b$). There are different ways in the literature to capture the B-semantics of the predicate ‘is present’ in detail, but all of them understand ‘presentness’ or ‘nowness’ as a notion analogous to the indexical notion of ‘here’: as an indexical, the semantic of which can only be determined within context and perspective of the utterer (thinker).⁴

A-theorists accept B-relations but understand them A-theoretically. They are *explained in terms of* A-relations, which is to say that when x is B-related to y, this is *by virtue of* the fact that x is A-related to y, such that

³ Correia and Rosenkranz give a similar account of A-properties, where ‘is past’ is equivalent to ‘is, for some $n \neq 0$, n days from the present’ or ‘ n days ago’, in case $n < 0$, ‘is future’ is equivalent to ‘is, for some $n \neq 0$, n days from the present’, or ‘ n days hence’ in case $n > 0$. (Correia and Rosenkranz 2011, p.28)

⁴The standard analysis is sometimes called the *indexical or token-reflexive theory of tenses* (cf. Goodman 1951); Mellor (1981, 1998); Quine (1960); Reichenbach (1947); Russell (1940, 1948); Smart (1949, 1955); Williams (1951).

x is earlier than y *by virtue of the fact that* x is more past (past to a higher degree) than y or x is less future (future to a lesser degree) than y;
 x is later than y *by virtue of the fact that* x is more future than y or x is less past than y;
 x is simultaneous to y *by virtue of the fact that* x is past to the same determinate degree as y or x is future to the same determinate degree than y or x and y are both present.

On the other hand, B-theorists *reduce* A-relations to B-relations, such that for B-theorists, to say that

‘x is more past than y’ is *equivalent* to saying that x and y are earlier than the time of reference and x is earlier than y;
 x is less past than y is *equivalent* to saying that x and y are earlier than the time of reference and x is later than y;
 x is more future than y is *equivalent* to saying that x and y are later than the time of reference and x is later than y;
 x is less future than y is *equivalent* to saying that x and y are later than the time of reference and x is earlier than y;
 x and y are present is *equivalent* to saying x and y are simultaneous with the time of reference.

Within the A-series, B-relations are explained in terms of A-relations, which is to say that the A-series accommodates both kinds of relation, A and B, although A-relations have explanatory priority over B-relations. In contrast, there really are only B-relations between the terms of the B-series. For B-theorists, A-relational terms (for example ‘more past than’) have B-theoretic meaning.

The A- and the B-series are two distinct temporal series. Importantly though, both series are *structurally* and *metrically isomorphic*. They are metrically isomorphic, because any difference in pastness-degree between two past events (or futurity-degree between two future events) is matched by the difference in how much earlier (or later) one event is from another. If for example x is 2 days hence (2 days from the present) and y is 3 days hence (3 days from the present), then y is one day more future than x- the difference between x’s and y’s distance from the present. This difference in degree matches with the temporal distance of x and y in the B-series. If y is one day more future than x, then y is exactly one day later than x.

The two series are *structurally* isomorphic, because they are merely two ways of conceiving time and temporal order. On McTaggart's picture, the A-and B-series are different ways of ordering the *same* terms. What distinguishes one series from the other is not the order of terms, or the terms themselves, but only the ordering relations. As Markosian puts it, it is an

(...) odd but seldom noticed consequence of McTaggart's characterization of the A series and the B series is that, on that characterization, the A series is identical to the B series. For the items that make up the B series (namely, moments of time) are the same items that make up the A series, and the order of the items in the B series is the same as the order of the items in the A series; but there is nothing more to a series than some specific items in a particular order. (Markosian 2010).

Note that Markosian makes a very strong claim here in identifying the two series. Although I agree with him that the terms and the order of the terms of the A- and the B-series are the same for McTaggart, I would insist that the series are distinct by virtue of the properties and /or relations that generate the orderings. So, to stress this point again, the A-series and the B-series are only different series with regards to *how* they are ordered. They differ neither with regards to their terms, nor with regards to the specific order in which those terms stand. In the following paragraphs I will say a bit more about the relation between the A-series and the B-series.

The debates that have been launched after McTaggart are mainly concerned about which temporal ordering, if any, is the one that corresponds to reality. McTaggart himself took both series to be essential for our understanding of time (1927, p.10), but considered the A-series nevertheless to be more fundamental to the concept of time. This thought was motivated by his assumption that we cannot conceive of time without change (1927, p.11), and that the B-series (as I explained before) does not allow for change (1927, p.11-5). But while McTaggart thought that only the A-series can accommodate change, namely the change that events and times undergo when they turn from being future, present and to past, he also thought that this very change leads into a vicious, infinite regress.⁵ He concluded that the A-series is, though fundamental to our understanding of time, incoherent (1927, p.18-24). This led him finally to the

⁵ More about McTaggart's regress argument in chapters 2, 3 and 4.

notorious conclusion that time itself is an incoherent concept and that there is no time in reality (1927, p.22). However, time is not entirely illusory on McTaggart's account. There is *something* in reality that corresponds to our ideas, namely a non-temporally ordered series that he called the *C-series* (1927, p.29-31). Its terms are the things that 'appear to us as [events] in time' (1927, p.31). The sequence of its terms matches with the experienced sequence of events, although the terms are, in reality, not events and the ordering relation is a-temporal. Not only are the terms of the C-series experienced *as* events, they are also experienced *as* having A-properties. According to McTaggart, we correctly experience some ordered series, but we falsely experience the terms of the series as events that have A-properties. And it is only once we experience the terms as being future, past and present, that we conceive them as earlier and later than each other. McTaggart thought that from the C-series and its appearance as A-series, the B-series can be *derived*: once the terms appear to have A-properties, they also appear to be earlier and later than each other.

I hope to have given a sufficiently clear introduction to some basic notions used in the metaphysics of time as first presented in the important works of McTaggart. As we will see, even though hardly anyone nowadays agrees with McTaggart's conclusion, his terminology and ideas still feature widely in the subject. Before I go on to explain the contemporary debate about temporal passage, I must settle a few further general terminological issues for the remainder of the thesis. This is what the next section will be focussing on.

1.3 Some terminological issues

Before I continue, I ought to clarify how I understand certain terms. Every thesis must make some background assumptions, assumptions without which we could never start to develop complex arguments. They are tacitly expressed by the way we understand and use the terms involved. The meanings of the terms are more often than not subject to highly controversial debates themselves. Obviously, different understandings of the same terms have a crucial impact on the arguments. It is my hope that by clarifying my terminology from the beginning that the focus of assessment will be on my arguments rather than on the background issues that pertain to the terms involved.

'Time'

The term ‘time’ is ambiguous between time as a dimension (like ‘space’), or as time-series, and time as a specific temporal location, or position in the time-series. The former usage is demonstrated in questions like ‘can we travel back in time?’, the latter in questions like ‘what time is it?’. Time in the former sense is the sum of all ‘time_s’ or moments. Whenever I use ‘time’ in the latter sense, I will say ‘a time’ or use the plural ‘times’. In that sense, ‘time’ is used equivalent to ‘moment’ or ‘instant’. There is a further ambiguity, as ‘time’ can be either understood in a *substantialist* or in a *relationist* sense. Substantialists think of time as an entity at which objects, facts and/or events (depending on one’s further ontological commitments) may or may not be located. To use Benovsky’s useful metaphor, substantialists think that

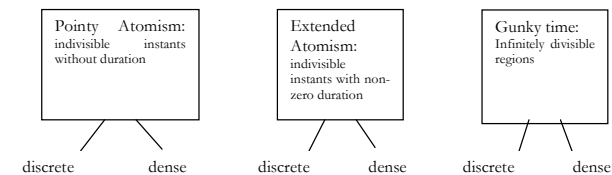
time is like a container in which events and things are placed, a container that exists independently of what is placed in it. (Benovsky 2011, p.491)

Substantialists allow for the possibility of ‘empty time’, times at which nothing is located, even though this is not necessarily part of the view. A contemporary version of substantialism is to think of times as coherent sets of propositions, as defended for example by Crisp (2007). It is a matter of debate whether substantial time (or space-time) is an abstract entity or a concrete particular (with times, or instants, as parts).⁶ Relationists, on the other hand, deny that times are entities ‘over and above’ the objects located at them. For them, time is nothing more than a net of relata, such as events or objects, standing in temporal relations with each other. While remaining neutral on the subject, I will (for reasons of clarity) use ‘time’ in a substantialist sense, unless a difference between the two views makes a difference to the point in question, in which case I will indicate it. Moreover, with the term ‘(a) time’, I will refer to the temporal position *and* whatever may be *strictly located* at it. With ‘strictly located’ I mean that whatever is located at that temporal position must have no part such that it is not located at that very position. Entities that comprise a time may be moments and events, objects, object parts, and facts. So when I say ‘time t has become past’ then I refer to the time as well as all entities that are strictly located at that time (again unless otherwise indicated).

‘Instant’, ‘moment’

⁶ For a useful discussion about whether substantial time is an abstract entity or a concrete particular, see for example Faye (2006). Faye argues, *contra* the ‘classic’ Newtonian substantialist position, that substantial time is an abstract entity because space and time, or space-time, do not have plausible identity conditions.

The terms ‘instant’ and ‘moment’ are used interchangeably with ‘time’ in the sense of temporal location. This might strike some people as problematic because talk of times, understood as instants or moments, appears to commit us to a certain view about the topology of time, a view I shall call *pointy atomism* about time. Pointy atomism holds that the time continuum is composed of zero-sized points, indivisible units that have no proper parts and no duration. Standardly it is assumed that if pointy atomism is true, then time is also *dense*. Time is dense if and only if for any two times (or regions of time) A and B, such that A is wholly before B (just as 2011 is located wholly before 2012) there is a third region C, such that C is wholly after A and wholly before B. However, it is also conceivable that pointy atomism is true, and time is *discrete*, where discreteness is just the negation of density. In other words, if the number of instants is finite, then time is *discrete*; if it is infinite, then time is *dense*. Pointy atomism conflicts with the *extended atomist* idea according to which the minimal units of time do have a non-zero duration. The extended atomist takes continua such as time (and/or space) to be necessarily extended. That is to say, even though the continuum can be divided into ever smaller parts, no matter how small those parts are, they always have a finite non-zero size. The smallest constituents have no proper parts and are not further divisible. Extended atomism could also be dense or discrete. Finally, on yet another view, there are no instants because every region of time is such that every proper part of it has itself proper parts. Or, differently put, every region of time is infinitely divisible. This account of time is sometimes referred to as *gunky* time.⁷ Although gunky time is usually thought of as dense, it is also conceivable that gunky time could be discrete: in that case, time would have a finite number of infinitely divisible regions (see next page for a diagram).



I understand my thesis not to be committed to any specific topology of time. For my purposes it shall suffice to understand ‘instant’, ‘moment’ or ‘(a) time’ as unit of time, or region of time, with

⁷The term ‘gunk’ for continua that are infinitely divisible is introduced by Lewis (1991). Philosophers who have defended time as necessarily extended continuum include Whitehead (1919) and Russell (1914).

minimal duration, where I understand a minimal duration as a duration that is too short to allow for intrinsic change. Accordingly, instantaneous objects are objects that do not exist long enough to allow for (intrinsic) change.

‘Term’

I define ‘term’ as a placeholder for all temporal entities with minimal temporal extension, which is to say entities that have either no duration or a duration that does not allow for any intrinsic change.

‘Entity’, ‘thing’

‘Entity’ and ‘thing’ are used interchangeably as most general terms, comprising concrete as well as abstract things.

‘Event’

Following Kim (1966), Martin (1969) and Taylor (1985), I understand events to be property exemplification at times. Note that in ordinary discourse an event is a happening of finite duration during which some object changes its properties. For example, last night’s event of salting the pasta involved the pasta changing from unsalted to salted. In the context of McTaggart’s argument however, ‘event’ is used as a more technical term, referring to what one might also call an ‘atomic event’. Atomic events have no duration (or minimal duration) and cannot undergo qualitative change⁸. Every temporally extended event is composed by atomic instantaneous events. Unless otherwise indicated, when I use the word ‘event’, I use it in the technical sense of ‘atomic event’, such that it is instantaneous and need not involve an object that changes.

‘Object’

Objects are concrete individual entities, comprising animate objects such as animals, persons, plants etc., and inanimate objects such as houses, galaxies, electrons. Sometimes object parts (spatial and temporal) are also objects. Objects participate in events. Standardly, events are understood to have a different mode of being from events: objects *exist*, while events *occur* or

⁸ According to McTaggart, there is one exception: atomic events can change in terms of their A-properties. I will come back to this later.

take place (Hacker 1982, p.477 pp.).⁹ Moreover, objects can move, while events cannot (Dretske 1967, p.479 pp.) and objects occupy their spatial location while events allow for co-location (Quinton 1979, p.197 pp.).

‘Facts’

I understand ‘facts’ as obtaining states of affairs and thus as concrete entities. Rather than true propositions, they are *truth-makers* of propositions, obtaining states of affairs that make propositions true (cf. Mulligan, Simons, and Smith 1984). Facts and events are different in so far as facts are sensitive to the (semantic and grammatical) structure of the sentence(s) by which they are expressed, whereas events do not have to be. The fact that Caesar has been killed is for example a different fact from the fact that Caesar has been stabbed. But, arguably, the event is the same: Caesar instantiates in both cases the property of having been killed, only that the event is more accurately described in the second case (cf. Casati 2008). In other words, facts are more fine-grained entities than events.

‘Proposition’

Propositions are understood as abstract entities and *truth-bearers*, that is, they can be true or false. Propositions are expressed by sentences.

Now that these terminological issues have been cleared out of the way, we can continue to the next section, in which I shall give a more detailed account of the contemporary debate about temporal passage. In the metaphysics of time we find several very closely related discussions, which are not always sufficiently distinguished from each other. The aim of the next section is to do exactly that. In particular, I argue that the question whether time passes or not is a question in its own right that must not be conflated with other questions in the vicinity.

1.4 Identifying the debate

In section two I outlined a rough distinction between dynamic views about time, views that defend the idea that time objectively passes or ‘flows’, and static theories that regard temporal

⁹ That said, I shall later argue that somebody who is a realist about events (believes that there are in reality such things as events), and who also thinks that temporal passage consists in a change of what exists, has to allow for events coming into and going out of existence.

flow as a psychological phenomenon, rather than a genuine feature of reality. In contemporary metaphysics we find many debates in close vicinity to the discussion about temporal passage. Questions about passage are often not properly distinguished from those other debates, which leads to unnecessary confusions and conflations. In this section I want to identify the main debates within the broad area of metaphysics of time. I then point out in what way they need to be distinguished from each other and from the discussion about temporal passage. I will focus on four main debates:

- (i) The A- versus B-theory debate
- (ii) The tense realism versus tense antirealism debate
- (iii) The eternalism versus presentism debate
- (iv) The tenser versus detenser debate

I will briefly characterise each and then illustrate how they relate to each other.

- (i) The A- versus B-theory debate

Contemporary analytic philosophers still couch their debates in the idioms McTaggart introduced. However, the idea that time is unreal is widely rejected these days and the discussion has since concentrated on how to refute his argument. The discussion of his argument has created two main opposing parties, so called *A-theorists* and *B-theorists*. A-theorists agree with McTaggart that time has a tensed aspect as well as a tenseless aspect, the tensed aspect being more fundamental to time.¹⁰ The tensed aspect refers to times having *A-properties* or *tensed properties* (properties of presentness, pastness and futurity) and to the fact that there is always one time that is objectively present, thereby giving that time an ontologically privileged status. What it exactly means to give the present time an ‘ontologically privileged status’ depends on the precise A-theory in question. Some views hold that only the present exist, others think that everything that is not present enjoys a somewhat ghostly existence. Williamson (2000) and Smith (1993) for example, think that future and past things do not have any spatial location- or any interesting intrinsic properties- they lack mass, shape and colour. While the privileged present view is standardly accepted by contemporary A-theorists, there are exceptions as well. Some A-

¹⁰For the defence of the A-theory see among others: Bigelow (1996), Broad (1938), Markosian (2004), Smith (1993), Schlesinger (1991), Zimmerman (2005).

theorists deny that the present is in any way special opposed to the future or the past. More precisely, they reject the idea that the gaining and losing of presentness goes together with some significant change. McTaggart (1927) for one, thought that events that undergo change in A-properties do not change in any other way. Broad (1938) also denied that becoming present or past involves any intrinsic change. While there is some disagreement among A-theorists about the status of the present, all A-theories hold that the present time is distinguished from other times in a way that is not relative to any frame of reference. Moreover, all standard A-theories endorse the idea that which time is present changes, which is what constitutes the passage of time for A-theorists. Things change as time goes by. The fact that I am eating was present a moment ago, but is not anymore. A-theorists think that facts, or, less committal to a fact ontology, *reality itself changes* over time (cf. Percival 2002, p.99). In other words, they standardly defend the idea that time passes. Note however, that even though standard A-theories are dynamic, temporal passage is not a necessary feature of the A-theory. It is at least not *prima facie* contradictory to have an A-theory without temporal passage. Static A-theories would describe ‘frozen’ worlds in which always the same time would instantiate the property of being present.¹¹ While this does not seem to be a very plausible or even theoretically virtuous position to hold, it nevertheless is a possible position to have.

The opposing *B-theory* rejects tensed properties and tensed facts. It holds that A-properties are reducible to B-relations, such that ‘being present’ is merely a contextually supplied notion, referring to some frame of reference such as ‘the moment that is simultaneous with this thought’. ‘Is past’ just means ‘earlier than the present moment’, ‘is future’, just ‘later than the present moment’ (see 1.2.). B-theorists tend to think of time as a dimension very similar to space.¹² Just like all spatial points co-exist without ontological differences among them, moments co-exist without ontological differences. Consequently they reject the idea of an objective present and of temporal passage. This been said, not all B-theorists think of themselves as static theorists. Exceptions to the rule are Oaklander (forthcoming) and Maudlin (2002). Oaklander defends the idea that time is dynamic, although in a different sense from the A-theorist. For him, the B-series is inherently dynamic just by virtue of the fact that the series is a *sequence* of different events. For Maudlin, temporal passage is ‘an intrinsic asymmetry in the structure of space-time

¹¹ I am not aware of anybody who defends a ‘frozen A-theory’.

¹² B-theorists include Le Poidevin (1996, 1998; 1987), Mellor (1981, 1998) Oaklander (1991, 1993, 2002, 2004), Quine (1960), Reichenbach (1947), Russell (1914, 1940, 1948), Smart (1949, 1955), Smith (1993), Williams (1951).

itself (Maudlin 2002, p.259), an asymmetry that is unique to time. It seems that Maudlin takes the notion of temporal passage to be exhausted by the fact that physical processes have an intrinsic direction.

Both, Oaklander and Maudlin, have a different concept of temporal passage from the A-theorist. They claim to defend a dynamic theory of time. However, the sense of ‘dynamic’ is in their cases crucially different from the sense in which A-theories are dynamic. At this point, it is important to clarify the relevant sense of ‘dynamic’ that my thesis is interested in. Consider the A-theoretic idea of temporal passage, according to which

(A) What is present was future and will be past.

For the B-theorist, A-properties are reducible to B-relations. Thus for her, the A-theorist’s description of passage as shown in (A), translates to the following:

(B) What is simultaneous with this time is later than some time which is earlier than this and is earlier than some time which is later than this (cf. Bigelow 1991, p.2)¹³

When we analyse (A) in a B-theoretic fashion, we get (B) — a claim that is trivially true and thus not something that any B-theorist would want to deny. Oaklander and Maudlin seem to consider the fact that (B) is sufficient for time to be dynamic (though most B-theorists are content with saying that the analysis shows that time is static).¹⁴ But A-theorists would of course reject the B-theoretic analysis of (A), because it presupposes that A-properties are reducible to B-relations. For them, (B) does not capture what is essential to time. Only (A), they claim, expresses temporal passage and the dynamic of time in the *relevant sense*, whereas (B) only describes the succession of terms in the time-series. The dynamic of time the A-theorist is talking about is *more* than what B-theorists like Oaklander or Maudlin want to concede. For A-theorists, the relevant dynamic sense is one that results from a special kind of change, a *change of reality as a whole*, which only occurs when times become present and cease to be present. The difference might be clearer with an example. Consider a chameleon turning from yellow to purple. According to the B-

¹³ Note that Bigelow himself does not endorse the B-theory.

¹⁴ Maudlin would probably want to add another clause to ensure that (B) expresses a direction of time.

theorist there is an earlier time t_1 , at which the chameleon is yellow, and a later time t_2 , at which it is purple. Both times, t_1 and t_2 , are constitutive of reality. The chameleon is always (at all times) yellow at t_1 and always purple at t_2 . The fact that the chameleon is yellow at one time and purple at another though makes reality qualitatively diverse, but it does not constitute a change of reality. If, on the other hand, the time at which the chameleon is yellow is *first present and then past*, then reality has changed. The idea is that reality ‘as a whole’ only changes if *the very same time* at which the chameleon is yellow, say Tuesday four o’clock, changes from present and to past (or from future to present). It is this specific change that all B-theorists would reject and which A-theorists find crucial for temporal passage. The sense of temporal passage that is relevant in this thesis is the A-theoretic sense. When I talk about the ‘relevant sense’ of temporal passage then I am referring to temporal passage that involves a change of reality as a whole. Consequently the debate that I refer to as the ‘dynamic versus static debate’ is the debate about whether or not reality can change as a whole. When I speak about ‘dynamic theories’, I mean to refer only to those theories that support the notion of temporal passage in the relevant sense.

Temporal flow or passage, in the relevant sense, involves some kind of change of reality. As we will see, the change can come in many forms, whether that be times acquiring and losing presentness, coming and ceasing to exist, becoming actual or becoming true. Within the B-series, there is no room for any such change. Even though reality is variable, in the sense that certain states of affairs obtain at some times but not at others, reality itself, as a whole, cannot change. We might say that the B-series allows for change *in* reality but not *of* reality. It is, however, change *of* reality that is necessary for there to be temporal passage in the relevant sense. Consequently, temporal passage, in the relevant sense, is incompatible with the B-theory.

To sum up, the notion of dynamic time and temporal passage that is relevant to this thesis is one that involves a change of reality, which occurs when a certain state of affairs is first present and then past. We can say that the crucial criteria for a theory to fall under the umbrella term ‘A-theory’ are, firstly, that it endorses A-properties, secondly, that it defends an objectively present time (a time that is present independent of the context of evaluation) and thirdly, that B-relations are derivable from A-properties (see 1.2). Opposed to that, the B-theory must reject A-properties and (the relevant sense of) temporal passage. Note that an endorsement of temporal passage, though standardly accepted by A-theorists, is neither necessary nor sufficient for a theory to be counted as A-theory.

(ii) The tense realism versus tense antirealism debate

Percival (2002) has convincingly argued that the A-theory should be distinguished from so-called *tense realism*. According to him, tense realism advocates the idea that reality changes as time passes just as much as the A-theory, but without positing the existence of A-properties (being past, present or future). Consequently, tense realists understand temporal passage quite differently from the way A-theorists understand it. Rather than a change of what is present, tense realists standardly conceive of passage as *change in what exists*. For the standard tense realist, time passes as new times come into existence and, for some tense realists, also cease to exist.¹⁵

In general, all tense realist theories reduce presentness to some other (objective) notion.¹⁶ Some of them take presentness to be equivalent to existence, so that to be present is just to exist (cf. Merricks 2007; Tallant 2010). Prior (1967; 2003) famously used tensed operators like ‘it was the case that’ and ‘it will be the case that’ to show that a tensed language and tensed semantics do not commit to anything instantiating A-properties. In his analysis, tensed predicates turn out to be sentence modifiers, or *sentential operators*, rather than predicates that refer to real tensed properties. A sentence like ‘Caesar *was* crossing the Rubicon’ for example, translates for Prior into ‘it was the case that (Caesar crosses the Rubicon)’, with the alleged advantage of relieving whatever is within the scope of the operator from any ontological commitment. According to Prior, the functional role of tense operators is similar to the functional role of modality operators. Thus on this view, the true proposition ‘Caesar crossed the Rubicon’ commits no more to Caesar’s crossing the Rubicon instantiating pastness, than the proposition ‘Suzy is possibly crazy’, commits to the event of Suzy’s being crazy instantiating possibility.

Other tense realists think that to be present is just to have a certain position in the time-series, like the position after which there is no other time anymore (cf. Tooley 2000). Others again identify times with sets of propositions, where to be present is to belong to a set that is

¹⁵ Other tense realists include Crisp (2005, 2007), Prior (1958, 1967, 1968b, 1968a; 2003), Tallant (2009, 2010, forthcoming), Zeilicovici (1981).

¹⁶ The tense realist notion of presentness must not be compatible with a B-theoretic notion of presentness.

true (cf. Crisp 2005; Bourne 2006a). None of them take presentness to be some unique property, as the A-theory would have it. I will come back to the various accounts of temporal passage on these views in section 1.5

Now, just as the A-theory, tense realism usually does, but does not have to assert that time passes. An exception would be Fine’s *fragmentalism*, a ‘non-standard tense realist’ view (2005, 2006), which is supposed to leave room for passage, without having it as an essential feature. According to fragmentalism, times are consistent sets of facts. Each time *t* is rendered present by the tensed facts that are constitutive of that time *t*. One time might for example contain the fact that Fine is (presently) sitting and the fact that the water in the kettle is (presently) boiling, another time the fact that Fine is (presently) standing and the fact that the water in the kettle is (presently) not boiling. Each time is intrinsically consistent but the facts that constitute different times do not have to be. As a consequence, reality is as a whole inconsistent, or as Fine says ‘fragmented’, where each ‘fragment’ of reality is a different time. Fragmentalism is not essentially dynamic, because each time is objectively present when it occurs. If each time is objectively present, then passage cannot be analysed in terms of a ‘moving present’. Indeed, it is questionable whether fragmentalism can be construed as a dynamic view at all, although according to Fine there is at least ‘no obvious impediment to accounting for the passage of time in terms of a successive now’ (2005, p.288)

Let me now say something about tense antirealism. Tense antirealism is the view that there are no tensed properties and, contra tense-realism, that time *cannot* pass. Note that tense antirealism and the B-theory are both static theories in the relevant sense discussed, that is, in the sense that they deny that reality as a whole can change. In fact, there is no case where the B-theory and tense antirealism could come apart — they are equivalent and I will henceforth use both names interchangeably.

To summarize, we have seen that tense antirealism and the B-theory are one and the same theory. Both deny the possibility of time passing. In contrast, tense realism and the A-theory are different in that tense realism does not commit itself to A-properties, though both standardly agree that time passes and that this consists in a change of reality. Once again, it is important to note that temporal passage is neither essential to the A-theory nor to tense realism, which is why none of the afore mentioned debates can be equated with the dynamic versus static debate.

(iii) Eternalist versus non-eternalist theories

Another prominent debate is that between eternalist and non-eternalist theories. In the literature, eternalist theories are referred to as *four-dimensionalism*, *eternalism* or *the block universe view*. ‘Four-dimensionalism’ is a somewhat unhappy term, because it sometimes also denotes a certain view about persistence, namely the view that all objects persist by having (not only spatial but also) temporal parts. Given its ambiguous usage, I will refrain from using the word ‘four-dimensionalism’ and will stick to ‘eternalism’ or ‘block universe view’ instead (and I will use these names interchangeably). Eternalism is the view that all times exist. In other words, it is the view that reality is not constituted of a special subset of times. Just as Mars exists, only very far away in space, so do all the objects and people that feature in the events of the year 356 B.C. exist; only very far away in time. This eternalist view about time is uncontroversial among B-theorists¹⁷, but only embraced by one dynamic theory, the *eternalist A-theory*, also called *moving-spotlight theory* or *hybrid theory*.¹⁸ The eternalist A-theory holds that all times exist, while still maintaining that times have differently tensed properties: there is a time that is present, times that are future to different degrees, and times that are past to different degrees. McTaggart, for example, presupposes an eternalist A-theory in his famous argument against the reality of time. Contemporary defenders include Schlesinger (1991) and Smith (1993).

Eternalism is rejected by all other dynamic theories. First of all, by (arguably) the most popular dynamic theory, *presentism*. Presentism holds that only the present exists. The passage of time consists for presentism in a change of what exists, as times come into existence and subsequently cease to exist. Presentism comes in A-theoretic and tense realist varieties. A-theoretic presentism is the view that ‘our most unrestricted quantifiers range only over present things’ (cf. Markosian 2004), or, differently put, that all and only those things exist that instantiate some primitive and irreducible property of presentness.¹⁹ Tense realist presentism reduces presentness in the sense that to be present just is to exist (cf. Merricks 2007), (Tallant

¹⁷ It is however not essential to a B-theory to be eternalist. There is room in the ‘logical space’ for a B-theory that believes in a subset of times, rather than all times. To my knowledge there is nobody who defends this kind of view though.

¹⁸ The label ‘hybrid theory’ is explained by the fact that although events are ordered in a static B-theoretic fashion, they have (changing) tensed properties.

¹⁹ For A-theoretic presentism see for example Bigelow (1996), Hinchliff (1996), Markosian (2004), Zimmerman (2005, 2008).

2010), to be the case (cf. Prior 1968b), to be actual as opposed to merely possible (cf. Bigelow 1991) or to belong to a set of propositions that is true (Crisp 2005, 2007).²⁰

Eternalism is also rejected by the dynamic *growing block theory*, which holds that the past and present are real, but disagrees with eternalism about the status of the future.²¹ According to this theory, the sum total of what exists increases as time passes and things become present. The growing block theory can also come in A-theoretic and tense realist variants. A-theoretic versions argue that reality increases as ever new present times come into existence (see for example (Broad 1938)). Tense realistic growing block views reduce presentness to a position in the time-series, such that to be present is to be the latest time in the time-series (cf. Tooley 2000).

As we have seen, we find common varieties of dynamic *and* static theories among eternalist theories. Among the non-eternalist theories, the dynamic ones are certainly more standard, but static non-eternalist views are at least also conceivable. Theories of this kind would be similar to a static A-eternalism: ‘frozen’ with one time being always the present. Therefore, just as with the previously discussed debates, we have to distinguish the eternalist versus non-eternalist debate from the dynamic versus static debate.

(iv) The tensor versus detenser debate

The tensor versus detenser debate is a debate that relates to the philosophy of language. The question is whether or not the grammatical tenses as used in ordinary language (as in ‘Julia *is* sitting’ or ‘Steph *has left* the house’) are essential to the meaning of the propositions expressed by these sentences or not. More accurately, there are actually two questions that are often brought up in the context of the debate. The first question is about whether grammatical tenses are necessary to express the meaning of the propositions they partake in. In other words, is it possible to translate, *salva veritate*, a tensed sentence into a tenseless one? The second question is about the facts that make tensed propositions true. I claim that only one of them, namely the first question, strictly pertains to the tensor versus detenser debate. For A-theorists and tense realists the reply to both questions is obvious. For them, reality itself is tensed and grammatical

²⁰ Philosophers who defend presentism along tense realist lines include Bigelow (1991), Bourne (2006a, 2006b), Crisp (2005, 2007), Merricks (1999, 2007), Prior (1958, 1959, 1967, 1968b; 2003), Tallant (2009, 2010).

²¹ Growing block theorists include Broad (1938), Tooley (1999, 2000), Zeilicovici (1981).

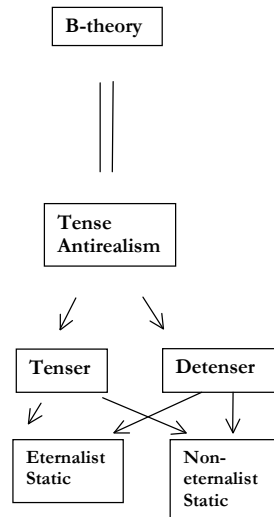
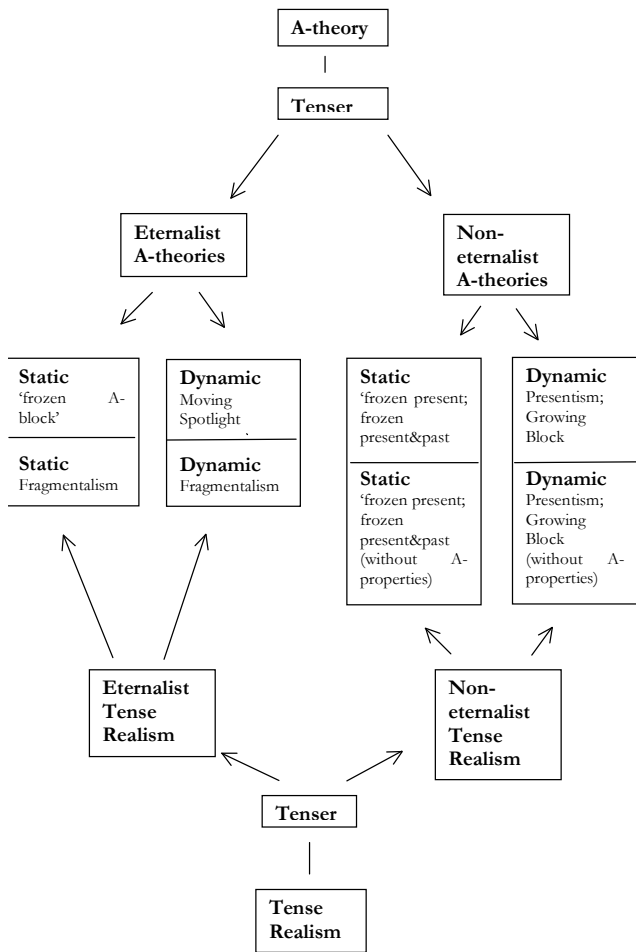
tenses therefore refer to some feature of reality. Consequently, tensed sentences cannot be translated into tenseless ones without loss of meaning. However, on the B-theorist side the answer is not so clear-cut. Even though all B-theorists agree in that reality itself is tenseless, there is considerable disagreement about whether or not our language reflects the fact that reality is tenseless or not. Some B-theorists think that sentences expressed in tensed discourse, such as 'Igor was swimming', can be eliminated or translated without loss of meaning to sentences in tenseless discourse, such as 'Igor swims at t', where t is some time earlier than the utterance of the sentence. This view assumes that a logical analysis of ordinary language that eliminates tensed discourse supports an ontological analysis of time that rejects tensed properties (cf. Oaklander 1991). Some philosophers who have argued along these lines include Russell (1914), Smart (1963) and Grünbaum (1964). B-theorists that have abandoned this strategy support the so-called *new theory of time* (Oaklander 1991). They reject the idea that tensed sentences can be translated into tenseless ones without loss of meaning, but hold nevertheless that our thought and talk in tensed terms is entirely consistent with its being the case that time is tenseless. For these thinkers, the truthmakers for tensed propositions are tenseless facts, not tensed ones. Among them we find for example Oaklander (1991) and Mellor (1981, 1998).²²

The first question is a question about the translatability of tensed sentences into tenseless ones. It needs to be clearly distinguished from the second question, the question whether or not tensed sentences (or, more precisely, the propositions expressed by those sentences) require tensed facts as truthmakers or not. The tensor versus detenser debate is about the first question. It is a debate about language, because it is discussed between theorists who agree about what is the case in reality (it is tenseless) and merely disagree about the fundamental logical structure of our sentences. We *can* understand the debate in a way that involves ontological issues, but we do not have to. Adherents of the new theory of time for example claim that we cannot translate tensed sentences into tenseless ones, but they do not thereby take themselves to be making any statement about the temporal nature of reality. The second question, on the other hand, shifts from matters about language and grammar back to questions about the world. It is a question that pertains into one of the metaphysical debates, the A-versus B debate or the tense realist versus anti-realist debate, rather than into the tensor versus detenser debate. Rightly understood, the tensor versus detenser debate is a debate about language. It should not be confused with the

²² Further adherents to the new theory of time include Beer (2010), Butterfield (1984), Macbeath (1983).

dynamic versus static debate, which is a debate about the structure of time itself, rather than the way we talk about it.

I have argued that the dynamic versus static debate should be separated from other main debates in the philosophy of time. The results of this section can be summarized as follows. The B-series cannot accommodate any change of reality, thus temporal passage, in the relevant sense, is incompatible with the B-theory. In contrast, it is possible to hold dynamic A-theories, such as A-presentism, the moving spotlight theory and the A-theoretic growing block theory, as well as static A-theories. The fact that dynamic as well as static A-theories are consistent options shows that we cannot conflate A-theories with dynamic theories. Likewise, there are common dynamic tense realist theories, such as tense realist-presentism and the tense realist-growing block view, but static tense realist views, such as one possible interpretation of fragmentalism, are, *prima facie*, not contradictory either. Eternalist theories can be static (standard B-theory) just as well as dynamic (moving spotlight theory). Non-eternalist theories are most naturally dynamic (presentism, growing block), but here as well we cannot exclude static non-eternalist theories on the basis of incoherence. The tensor versus detenser debate, finally, is entirely orthogonal to issues about temporal passage. Whether or not grammatical tenses belong to the fundamental logical form of sentences or not, *once it has already been decided that reality is tenseless*, has nothing to do with the question whether time passes or not. See the next page for a diagram that might help to illustrate the different positions and their relation to each other.



By now it should be clear that the discussion about time's passage is an independent discussion that should not be conflated with other discussions. Even though different theories might standardly be more on the dynamic or the static side, the exception to the rule is, in most cases, not inconsistent. That means that temporal passage (or the absence of it) cannot be an essential feature of these theories. If this is the case though, then we have to treat the debate about temporal passage as a unique debate.

I hope to have sufficiently shown that the debate about temporal passage should not be conflated with other theories. Throughout this section, I have mentioned different accounts of temporal passage. I will end the first chapter with a brief preliminary overview of those various accounts. The overview will reveal an important feature common to temporal passage theories, a feature that will be of crucial importance in what is to come in the following chapters. It is claimed that all theories of temporal passage construe passage either as change in Λ -properties, or change of what (actually) exists.

1.5 Varieties of temporal passage

The passage of time can be construed in a variety of ways. For eternalist A-theorists (moving spotlight theorists) like McTaggart, it is constituted by times successively obtaining and losing the property of being present.¹ For presentism and the growing block theory, passage is what Broad called '*absolute becoming*' (1938) — the becoming or unfolding of reality itself as different times successively come into existence. Presentism, but not the growing block theory, additionally holds that times cease to exist when they become past.² Among presentist and growing block theories only some link absolute becoming with the property of being present. These A-theories argue that times acquire presentness as they come into existence and, in the case of Λ -presentism, lose that property when they cease to exist. In contrast, tense realist theories endorse absolute becoming, but reject presentness as a property. Some tense realist views reduce presentness to existence, so that to be present is just to exist. Temporal passage, for them, is simply the coming into and (on some views) going out of existence (Merricks 2007;

¹ Whether or not McTaggart would be considered an A-theorist depends on how we understand the qualification. On the one hand he is clearly not an A-theorist, because he thought that the A-theory is inconsistent. On the other hand it also makes sense to say that he is, because he held that the A-theory is essential to our concept of time.
²In later chapters, I will employ Broad's term '*absolute becoming*' as a term that describes coming into existence *and* ceasing to exist.

Tallant 2009, 2010, forthcoming). Other tense realists think of temporal passage as successive actualisation of possible times (Bigelow 1991; McCall 1976). One way to construe this kind of view is to reduce presentness to actuality, so that to be present is to be actual, as opposed to merely possible. Time passes, as possible future times become actual. A further variation is to give an account of passage in terms of changing truth-values. (Bourne 2006a, 2006b; Crisp 2005, 2007). Philosophers who defend this sort of view think of times as sets of propositions, where only the present time is true, past times have been true and future times will be true. Combined with the view that propositions are made true by facts, which serve as truthmakers, the idea is that only present facts exist, so that only present tensed propositions have truth-makers. As facts come and go out of existence, times (understood as propositions) gain and lose the status of being true.

Even though there are multiple ways to construe temporal passage, we can categorise the accounts into only two different kinds. Either passage is seen as change with regards to A-properties, or of change of what (actually) exist. This is even the case for theories that construe passage as change in truth-value (at least those that also support a truthmaker theory), because according to them, a time becomes true only if there is a truthmaker that comes into existence, and it loses this truth-value once the truthmaker ceases to exist.

Considering the variations of temporal passage that I have mentioned, it is obvious why the B-theory cannot accommodate temporal passage. To start with, B-theorists reject the irreducible, objective property of being present, therefore there cannot be any change in terms of times acquiring and losing presentness. Also, there cannot be change in what exists for the B-series. For the B-theorist, reality is always constituted by the very same times. The time when Caesar crossed the Rubicon is just as much part of reality as the time of the third millenium. Caesar himself did not cease to exist- for a B-theorist, Caesar's going out of existence with his death in 44 BC just means that his life is temporally located before our lives. There is no time during the period of his life that coincides with the present time, where the present time, for the B-theorist, is the time that is concurrent with my writing of this lines or your reading of it. Further on, if some state of affairs (S) is merely possible at one time, and then actual at some other time, then, given the B-theory, it is always the case that (S) is possible at that one time and actual at that other time. Finally, if some proposition (p) is true at one time and false at another, then (p) is, according to the B-theory, always true at that one time and false at that other.

I hope to have given a clear introduction to the discussion about temporal passage and the terminology in which it is conducted. The next chapters will take a closer look at McTaggart's famous paradox- an argument against the coherence of temporal passage. It is embedded in McTaggart's overall argument against the reality of time. For a thorough understanding of his case against passage, we have to look at the argumentative context. For this reason, the next chapter will be concerned with the first part of the argument against time. The consecutive chapters will then move on to the second part, which deals with the passage of time.

Chapter Two

McTaggart's 'No Time Without Passage' argument

McTaggart famously argued that time is unreal (1927, p.18 pp.; 1908). His argument consists of two parts. In the first part, which I will call the 'Change Argument', he claims that there cannot be time without change, but that change of any kind is only possible given a very unique, fundamental sort of change: change of terms with respect to their A-properties. For McTaggart, this unique change constitutes temporal passage. In the second part of McTaggart's argument, which I will call the 'Paradox Argument', he purports to prove that temporal passage is incoherent. He concludes that if temporal passage is incoherent, then there can be no change, and as there is no time without change, time itself cannot exist. I shall focus on the paradox of temporal passage. That said, it is too often ignored how much the paradox argument builds upon the Change Argument. In this chapter I shall briefly analyse the Change Argument, before I turn in chapter three to the Paradox Argument.

Chapter two will be divided into four sections, where the first three are each dedicated to one of the three premises of the Change Argument. I argue that the first premise can be defended against objections involving a dispute between substantialist and relationist accounts of time. The second premise is crucial for McTaggart's overall claim: it involves the rejection of Russell's notion of change. I argue that McTaggart's claims do not have much ground to stand on. Given that my focus is on passage though, I will not defend Russell's notion of change, but shall accept McTaggart's notion of change because we need it to judge the Paradox Argument in the next chapter. The third premise, treated in the third section, reveals what temporal passage is for McTaggart and what role it plays in his understanding of time. The last section is a short note on the dialectic of this part of the thesis. I shall explain various ways of arguing against McTaggart's overall argument and in which way they are (or are not) relevant in the context of this thesis.

Chapter three will be devoted to the Paradox Argument and chapter four to objections against it.

2.1 There is time only if there is change

The Change Argument is one of two arguments that constitute McTaggart's overall argument against the reality of time. It first states that there is no time without change, then that real change must concern every single term in a time-series, and finally that the only respect in which an individual term can change, is in its A-properties. The argument shows the significance of A-property change for McTaggart's overall argument: Without change in A-properties there is no change at all, and without change, there is no time. I take the main structure of the Change Argument to be as follows:

P1: There is time only if there is change.

P2: Every change occurs in virtue of some change in the terms of the time-series.

P3: Terms change only with regards to their A-properties.

Conclusion:

There is time only if terms change with regards to their A-properties.

The argument is valid. How can we understand the premises? I shall go through each premise one by one, starting with the first one. McTaggart takes the first premise to be uncontroversial:

It would, I suppose, be universally admitted that time involves change. In ordinary language, indeed, we say sometimes that something can remain unchanged through time. But there could be no time if nothing changed. (McTaggart 1927, p.11)

It is unclear how strong McTaggart understands the 'could' in 'there *could* be no time if nothing changed'. On a stronger reading of 'could', the claim expresses a metaphysical or conceptual necessity. It then says that in every possible world without change, there is no time, or, respectively, that the concept of time essentially involves change. On a weaker reading, the 'could' is a nomological 'could' and the claim would then be something along the lines of '*in all nomologically possible worlds*' it is true that if there was no change, then there would be no time'. McTaggart fails to clearly specify one or the other. The difference matters for the overall conclusion: either there is no world with time, or there is no nomologically possible world with time, which would imply that we live in a world without time. Though it is not made explicit, I think it is safe to say that McTaggart had the stronger reading in mind.

He considered change to be essential to our concept of time. Thus he must have thought that if it turned out that there was no change, then time could not be real- not just in a 'matter of fact' way, but because the concept of time would not be intelligible. Consider once again the weaker reading stating that, in the actual world, there could be no time without change. The weaker reading expresses some claim that is nomologically necessary. Nomological necessities are determined empirically. Only how would we determine such a claim empirically? Even if we had epistemically guaranteed access to the fact that there is time and change, we could not 'test' the hypothesis that without change there could not be time. Of course one could say that the claim is not an empirical claim, but then it is not sure what it is based on or how it could be justified. Claims that express nomological necessity cannot be easily separated from their empirical foundation. Therefore I think that we must understand (P1) as a stronger, metaphysically or conceptually necessary claim.

There remain further unclaritys. In his *Examination of McTaggart's Philosophy*, Broad (1938) claims that (P1) ought to be understood such that

between any two terms x and y there is always a third term z that is qualitatively different from x and y. (Broad 1938, p.259)

In other words, Broad interprets McTaggart to say that in order for there to be time (a time-series) there ought to be change at *all* times. It is not evident, according to Broad, why McTaggart thought that there could not be a period of time during which no change occurs. Although Broad's criticism seems *prima facie* plausible, I am not sure whether I can entirely agree. McTaggart seems to think that there would not be anything in virtue of which some supposed period of time without change could qualify as a period of time. His reasoning for this becomes more evident, once we distinguish between a relationist view of time and a substantialist view of time. On both views it is far from obvious that McTaggart is wrong.

For relationists, time is merely a net of temporally related events and objects. From a relationist point of view, the idea that there ought to be some change for time to exist makes sense. For consider a universe with a time-series that consists only of a time x and another time y, where each time is constituted by exactly one event. If nothing changed between x and y, then

the event that constitutes x would be qualitatively identical to the event that constitutes y.¹ According to Leibniz's principle of the identity of indiscernibles, x and y would be the same.² If x and y are in fact one time, then it makes sense to question whether there is time at all in that universe. Or, differently put, is one time, understood as nothing 'over and above' the event that constitutes it, sufficient to constitute time? It seems implausible, because what would make that event a time? Not the fact that it instantiates temporal relations, because the event is alone in the universe. Relationists think of time as a net of temporal relations, where events are the 'knots' in the net- but if there is only one 'knot', it seems wrong to identify it with what is normally a net. Therefore, relationists would be happy with McTaggart's claim that there needs to be some change for time to exist.

What about substantialists though? According to them, times are entities 'over and above' the things located at them. Consider for example an entirely empty universe. Nothing here changes, because there is nothing to undergo change. Nevertheless, the universe exists for a billion years, say. For a substantialist, this is a viable view — on her view there could be 'empty' time without change. Must a substantialist therefore disagree with McTaggart's first premise? Not necessarily. Even on such a picture, a substantialist sympathetic to McTaggart could argue that there is still *some* change. She could argue that time changes, as different moments succeed each other in the series.³ If this is acceptable, then as long as there are at least two moments, there is change. Another option would be the presentist way: there is only ever one time, but which time exists changes. Thirdly, there could be only one time that becomes more and more past. In any case, for McTaggart's point to go through, what the substantialist would have to reject would be an empty world with a time-series that is constituted by only one and the same time that does not change its properties. It is a different question how a substantialist could justify such a rejection. But let us grant McTaggart at least that (P1) could be accepted by benevolent relationists and substantialists.

¹ One could say that the event that constitutes x differs in its *haecceity-* or *thinness-*property from the event that constitutes y; but in that case there would be a change- namely in the haecceity properties of x and y.

² 'The Identity of Indiscernibles is usually formulated as follows: if, for every property F, object x has F if and only if object y has F, then x is identical to y.' (Forrest 2011)

³ This move would be analogous to the 'haecceities move' on the relationist side.

2.2 McTaggart's rejection of 'Russell Change'

Premise two is McTaggart's refutation of 'Russell Change', that is change as defined by Russell in the *Principle of Mathematics* (1903). According to Russell,

Change is the difference, in respect of truth or falsehood, between a proposition concerning an entity and the time 'T', and a proposition concerning the same entity and the time 'T', provided that these propositions differ only by the fact that 'T' occurs in the one where 'T' occurs in the other. (1903, section 442).

So, according to Russell, change occurs if the proposition 'at time 'T' the poker is hot' is true and the proposition 'at time 'T' the poker is hot' is false. This notion of change is also known as *Cambridge Change*⁴ (Geach 1969). Essential to Cambridge Change is that it occurs over time and involves a variation in the properties of the subject that changes. McTaggart finds himself 'unable to agree with Mr. Russell' (McTaggart 1908, p.14). For McTaggart, a poker being hot on a particular Monday and not hot on other days satisfies Russell's definition, but it does not undergo any change in its qualities. There is merely a 'dissimilarity of the 'event of being cold' and the 'event of being hot (...) happening to the same object' (1927). Crucially, though, the poker will *always* be hot on that particular Monday and *always* cold on the other days:

But this [a poker being hot at one time and cold at another] makes no change in the qualities of the poker. It is always a quality of that poker that it is hot on Monday. And it is always a quality of that poker that it is one which is not hot at any other time. Both these qualities are true of it at any time- the time when it is hot and the time when it is cold. And therefore it seems erroneous to say that there is any change in the poker. The fact that it is hot at one point in the series and cold at other points cannot give change, if neither of these facts change — and neither of them does. (McTaggart 1927, p.14-5)

McTaggart's point is that qualitative variation over time is something that is *permanent*: an object that is F at t_1 and not F at t_2 is so always and thus does not constitute any real change. In

⁴ Some people mean with 'Cambridge Change' the change that for example a tree undergoes when another tree grows taller than it. Standardly though, this kind of change is distinguished from Cambridge Change as '*mere* Cambridge Change'. I will stick to the standard use of 'Cambridge Change', thus as referring to any change that can be described by Russell's notion of change.

McTaggart's own words, 'there can be no change unless some propositions are sometimes true and sometimes false' (1927, p.15), for it is always true that the poker is hot on Monday and it is always true that the poker is not hot on Tuesday. Given Cambridge Change, no proposition can ever change its truth-value at any time. For this to be the case, *both facts*, the fact that the poker is hot on Monday *and* the fact that the poker is not hot on Tuesday need to change. In other words, McTaggart thinks that qualitative variation along the time-series is not enough to constitute real change. Real change only occurs when *individual terms* in the time-series change.

Where does the motivation for the claim about real change come from? It seems to rely on the thought that in order for a temporally extended entity to change, at least one of its (temporal) parts have to change. This can be expressed with a principle that I will call *Dependency*:

Dependency

For every x such that x is temporally extended and changes, there's a y which is a proper temporal part of x and such that x changes in virtue of y changing.

On the face of it, Dependency sounds plausible. Suppose you are listening to a song and suppose that the song becomes louder while it goes on. Surely for the whole song to become louder, at least one of its parts must change in volume. If Dependency is true, then McTaggart appears to be right: if every temporally extended entity only changes in virtue of some proper part of it changing, then every change necessarily depends on a change in some instantaneous part that has no further proper parts. On deeper reflection though, Dependency seems to beg the question, because it already presupposes that variation over time does not suffice for real change, by building the idea of 'instantaneous change' (change of an instantaneous subject) into the principle. The only proper part which has no further proper part must be some instantaneous object, so y's change is a change of an instantaneous object. It is true that for a song to become louder, there must be some change in its parts, but that change could be such that there are at least two differently loud (loudly played) tones in it. This variation in volume, however, does not require each individual tone to change in volume.

As yet, it is not quite clear why McTaggart thinks that variation in time does not suffice for real change. It cannot be just the argument that the fact that x is F and then G itself does not change, because this is merely to repeat the point that variation is not enough for change. He

gives a further argument that points out the difference between (temporal) change and spatial variation. If variation would suffice for change, he says, it would not be clear why we call only the former, but not the latter ‘change’:

Let us consider the case of another sort of series. The meridian of Greenwich passes through a series of degrees of latitude. And we can find two points in this series, S and S', such that the proposition “at S the meridian of Greenwich is within the United Kingdom” is true, while the proposition “at S' the meridian of Greenwich is within the United Kingdom” is false. But no one would say that this gave us change. Why should we say so in the case of the other series? (McTaggart 1927, p.15)

In other words, if all there is to change is qualitative variation, then why would we make a difference between change and mere variation? Of course one might say that change is just qualitative variation *in time*, but when the existence of time necessarily relies on the occurrence of change, then this explanation seems circular. It has to be said that since McTaggart, there have been many noteworthy attempts to meet the circularity challenge by the defenders of Cambridge Change. Non-circular accounts have been for example given with appeals to causality (cf. Tooley 1999), although this shall not be the place to judge their success. In any case, McTaggart rejects Cambridge Change because he thinks firstly that it lacks the dynamic essential to real change, and secondly, because it makes the distinction between mere variation and change mysterious. Instead he insists that real change must involve a qualitative variation in *individual times*. How this is possible, and in what way one can understand this, will be explained in the next section, where the focus will be on McTaggart’s third premise.

2.3 Genuine Change

In the last section I have explained that McTaggart rejects Cambridge Change with the argument that real change must involve change in individual times. The question is now how we are to understand this. McTaggart admits that individual times, as instantaneous entities, cannot change in ordinary ways. A poker being hot at some moment in time cannot become colder *at that very same moment*. On the other side he rejects change as variation over time. According to McTaggart then, a temporally extended event, like the cooling off of a poker, can never change in any of its qualities. This is because McTaggart thinks that real change requires change at each moment, but

it seems to be in the nature of ordinary change (that is, change as it is pre-philosophically understood) that it takes more than one moment to occur. So how can individual times change? McTaggart’s answer is that it is *only in one aspect* that they can change: in becoming less future, present and more and more past. The fact that the ball landed in the net to make Italy’s decisive goal against Germany in 2006 never changes, apart from being first future, then present and then more and more past. Here is how McTaggart puts it himself:

Take any event- the death of Queen Anne, for example- and consider what changes can take place in its characteristics. That it is a death, that it is the death of Anne Stuart, that it has such causes, that it has such effects- every characteristic of this sort never changes (...) At the last moment of time — if time has a last moment- it will still be the death of a Queen. And in every respect but one, it is equally devoid of change. But in one respect it does change. It was once an event far in the future. At last it was present. Then it became past, and will always remain past, though every moment it becomes further and further past (McTaggart 1927, p.13).

Real change, for McTaggart, is change of times with respect to their A-properties. To the relation between real change and Cambridge Change he says the following: Cambridge Change *becomes* change, or differs from spatial variation, purely by virtue of the fact that it occurs in a temporal series, where a series is temporal if and only if its terms change with respect to A-properties. Therefore Cambridge Change is dependent on, and less fundamental than, change in terms of A-properties. Differently put, Cambridge Change (but not spatial variation) *supervenes* on real change, change in A-properties: the former occurs only if the latter does. So to sum up we can say that for McTaggart, time essentially involves real change and that Cambridge Change can only be classified as change in so far as the *individual terms* in the time-series change with respect to their A-properties. I will call this conception of real change *Genuine Change*.

Genuine Change.

x undergoes Genuine Change, if and only if x is a term in the time-series and x changes with respect to its A-properties.⁵

Genuine Change is the fundamental change on which all other change depends. Genuine

⁵ Remember that I have defined ‘term’ as anything that might constitute or strictly occupy one temporal position: a time, an event, a fact, an object, object part and so forth.

Change is what constitutes for McTaggart temporal passage.

2.4 Some remarks on the dialectic of this (part of the) thesis

Someone who wanted to reject McTaggart's overall argument that time is unreal could simply argue that the Change Argument is unsound. I have shown that particularly the second premise is very vulnerable to objection. My own interest, however, is not to refute the claim that time is unreal, but to show that there is a coherent notion of temporal passage. It might well be that time does not require passage, but this does not yet show that passage is incoherent. My aim is not to disprove static accounts, but to show that temporal passage is possible. If I succeed, I will also have succeeded in rejecting McTaggart's claim that time is unreal. However, there are several ways to object to McTaggart's argument about the unreality of time, only some of which overlap with my own goal to defend passage. The first would be to show that there could be time without *any kind* of change. This line of argument is not of interest to me, because I try to defend the coherence of temporal passage conceived as some kind of change. The second is to argue that there could be time without temporal passage. This would entail a defence of Cambridge Change in its own right. But as I said already, a defence of Cambridge Change does not amount to a refutation of temporal passage. The last option is to agree with McTaggart about the incoherence of Genuine Change, but to claim that temporal passage should not be conceived as Genuine Change. This is what I will argue. In doing so, I will show that there are coherent notions of temporal passage. As a 'side-effect', I will have also given an objection to McTaggart's claim that time is unreal. However, this is only some additional 'bonus'. The main focus of this thesis remains on time's passage, not on the reality of time itself.

In the next chapter, I shall consider McTaggart's famous argument against passage: the paradox of temporal passage.

Chapter Three The Paradox of Temporal Passage

In the last chapter I introduced the framework in which McTaggart construes his argument against the passage of time. McTaggart assumes an 'A-eternalist' or 'moving spotlight' view of time according to which all times exist, only one of which is present and which time is present always changes. According to his view, time is only possible when there is change but the only way in which the time-series can change is with respect to terms changing from future to present to past. This change, the change of terms with regards to their A-properties, I have called 'Genuine Change'. In this chapter I shall present McTaggart's paradox of temporal passage and my reconstruction of it. McTaggart thought that temporal passage is incoherent because it leads into an infinite vicious regress. I will agree that McTaggart's passage leads into a vicious regress, although I will also argue that the regress is vicious in another sense than he thought it was. My basic idea is that McTaggart's paradox is best understood as a special case of the general problem of change, as 'problem of Genuine Change'. The aim of this chapter is to show that McTaggart's argument against passage works, as long as we accept his analysis of passage as Genuine Change. In the next chapters I shall show that we need not accept Genuine Change and that temporal passage can be construed coherently if we adopt a different understanding of it. The lesson to learn from McTaggart is not that temporal passage is incoherent, but that temporal passage understood as Genuine Change is incoherent.

Chapter three is divided into four sections. Section one starts with a brief summary of McTaggart's original argument. Section two introduces the problem of change and three standard solutions to it as presented by Lewis. In the third and fourth section, I will present my reconstruction of the paradox. Section three explains how McTaggart arrives at the claim that leads into the regress. It is argued that the first three claims of McTaggart's argument are best understood as claims that follow from the fact that none of the standard solutions to the (general) problem of change can be applied to the problem of Genuine Change. The conclusion of section three is that Genuine Change must be relational change. Section four shows how passage, construed as relational Genuine Change, leads into a regress, and why and how the regress is vicious.

Chapter four deals with some paradigm objections against McTaggart's paradox as frequently found in the literature. Some of these objections focus on a 'red herring' in their attack. Others try to show that there is a fault in the premises of McTaggart's argument. I shall argue that these strategies do not succeed. McTaggart's argument does work, given his assumptions about time and the nature of temporal passage. In chapter five I shall therefore introduce a different strategy contra McTaggart which shows that there are other ways to understand temporal passage that are not vulnerable to his argument.

3.1 McTaggart's Paradox

In the last chapter I introduced Genuine Change. Genuine Change is the change that times undergo when they change from being future, to present and then to past. It is this kind of change, Genuine Change, that constitutes for McTaggart the passage of time:

The movement of time consists in the fact that later and later terms pass into the present, or- which is the same fact expressed in another way- that presentness passes to later and later terms. (1927, p.10, footnote2)

McTaggart thought that passage is an incoherent notion, because Genuine Change leads into an infinite, vicious regress. In a nutshell, the argument goes as follows: Given temporal passage, all terms in the series must undergo Genuine Change, which requires that we attribute to each term all A-properties. A-properties are by definition mutually exclusive, so that any attribution of more than one to the same term results in a contradiction. To avoid the contradiction, we have to qualify the having of A-properties to different times, but as these times are equally subject to temporal passage, the same problem emerges again, so that we are launched into an infinite vicious regress.

The argument starts with two assumptions:

- (A1) All terms in the time-series pass from being future to being present to being past.
- (A2) Pastness, presentness and futurity are mutually exclusive.

(A1) is supposed to capture the intuition behind the thought that time passes. It states that each term in the time-series instantiates A-properties, but that no term instantiates the same A-property permanently. From (A1), McTaggart infers the first premise of his argument, which states that each term must have all A-properties:

- (1) For all terms T, T is past, present and future.¹

But given (A2), (1) is contradictory. According to McTaggart, we can only avoid the contradiction by making the step to (2):

- (2) For all terms T, either T *is* present, *has been* future and *will be* past or T *is* past, *has been* present and *has been* (before that) future or T *is* future, *will be* present and *will be* (after that) past.

This response seems obvious: Terms are future, present and past, but *not at once*. Any term that *is* present, *has been* future and *will be* past. Note here that pastness, presentness and futurity are determined in such a way that the meaning of 'x is present' entails that x is not past and that x is not future and analogously for the other tenses. Therefore it is contradictory to say that x is present and past and future at the same time. A contradiction only occurs when a term has more than one A-property at the same time, but not if different A-properties are had successively. Just as an apple cannot be both red all over and green all over at the same time, there is no problem in it's first being wholly green and then being wholly red. Equally, a term cannot be present and past (or present and future, or future and past) at the same time, but there is no problem in it's being first present and then past. In McTaggart's words:

The characteristics are only incompatible when they are simultaneous, and there is no contradiction to this in the fact that each term has all of them successively. (McTaggart 1927, p.21)

¹McTaggart sometimes speaks about events changing their A-properties (McTaggart 1927, p.20, footnote1)His argument does not depend on what entities specifically undergo Genuine Change, as long as they are in the time-series and do not occupy more than one temporal position. I will come back to this point in chapter four.

What is crucial for the argument is the way McTaggart then analyses what propositions such as ‘T has been future’ or ‘T is present’ or ‘T is will be past’ mean:

When we say that X has been Y, we are asserting X to be Y at a moment of past time. When we say that X will be Y, we are asserting X to be Y at a moment of future time. When we say that X is Y (in the temporal sense of ‘is’) we are asserting X to be Y at a moment of present time. (1927, p.21)

Thus for McTaggart, (2) ought to be understood as (2*):

(2*) For all terms T, either T is present at some present moment of time, is future at some past moment of time, is past at some future moment of time or is past at some present moment of time, present at some past moment of time, future at some (earlier) past moment of time or is future at some present moment of time, present at some future moment of time and past at some (later) future moment of time.

However, as time passes, the ‘moments of time’ at which T is past, present or future also change their A-properties. Consider for example ‘T is past at some future moment of time’. The moment at which T is past, is *not always* a future moment. As time passes, the future moment becomes present and then past. It follows that T is past at a future moment, and past at a present moment and past a past moment, so that we get a contradiction again. The same applies for ‘T is present in the present’ and ‘T is future in the past’ and to all other predicates in the other two disjuncts. In short, (2*) implies (3):

(3) For all terms T, T is (now) present and has been present and will be present and T has been future and is(now) future and will be future and T will be past and is (now) past and has been past

(3) is again contradictory because each term instantiates not only all three first-order A-properties, but also all nine ‘second-order A-properties’. ‘Second-order A-properties’ are properties such as ‘has been future’ or ‘will be past’. For simplicity, I will introduce the way McTaggart’s higher-order A-properties are standardly described in the literature, such that ‘has

been future’ is understood as ‘pastly future’, ‘is present’ as ‘presently present’, ‘will be past’ as ‘futurely past’ and so forth.² Of the nine second-order properties some are incompatible again (such as for example presently present, pastly present and futurely present). When we apply the same strategy by saying that no term is, say, ever presently present, pastly present and futurely present at the same time, then we have to introduce further moments in time, which itself change their A-properties as time goes by. The contradiction emerges on every further level and we launch an infinite regress that McTaggart takes to be vicious.³ Differently put, the argument can be summarized in the following way: It starts with the claim (1) that, in order for time to pass, all terms must be past, present and future. By (A2) this is contradictory, so that (1) is corrected with (2) - the having of incompatible A-properties is qualified to different moments of time. By McTaggart’s understanding, (2) leads (via 2*) to (3), where (3) is contradictory again, as it ascribes incompatible second-order A-properties to terms. The having of these properties must be again qualified to different moments of time, which leads to the attribution of incompatible third-order A-properties. We can qualify the having of incompatible third-order A-properties to further moments in time, but only to end up with a contradictory attribution of fourth-order A-properties, which must then be qualified again to different moments in time, and so on. According to McTaggart we are launched into an infinite, vicious regress.

In what follows, I shall present a reconstruction of McTaggart’s paradox that is based upon the idea that the paradox is a specific case of the general problem of change. Before I will come to the reconstruction, I shall introduce the problem of change and three standard solutions to it as found in the literature.

3.2 The problem of change

My reconstruction of McTaggart’s paradox is based on the idea that it can be construed as a specific case of the general problem of change. Roughly speaking, the problem of change concerns the question how one and the same thing can instantiate incompatible properties. McTaggart takes temporal passage to be some unique kind of change, Genuine Change, the change that terms undergo with respect to their A-properties. The problem of Genuine Change

² The nine second order A-properties are: presently present, pastly future, futurely past, pastly present, futurely present, presently future, futurely future, presently past, pastly past.

³ I will explain why he thinks the regress is vicious and evaluate that claim in section 3.4.

concerns the question how one and the same *term* can instantiate incompatible *A-properties*. I argue that McTaggart's argument succeeds because the usual solutions available to the problem of change fail in the case of Genuine Change. Before I begin with my reconstruction, it makes sense to say a few things about the problem of change and to briefly introduce the standard solutions that have been suggested to the problem of change.

The problem of change starts with the question how it is possible for *one and the same thing* to instantiate incompatible *intrinsic properties*. An intrinsic property is, intuitively understood, a property that an object has 'by virtue of itself, depending on no other thing' (cf. Dunn 1990, p.178). Paradigm examples are for example height and shape properties. Changes in terms of intrinsic properties, so-called *intrinsic changes*, require their subjects to instantiate incompatible intrinsic properties. A rabbit that turns fat, for example, must instantiate (all over) slimness and (all over) fatness. More generally expressed, change requires that

$$(F(a) \ \& \ G(a)) \ \& \ (F \ \text{and} \ G \ \text{are incompatible})$$

from which we can derive a contradiction:

$$((F(a) \ \& \ \neg F(a)) \ \& \ (G(a) \ \text{and} \ \neg G(a)))$$

The obvious solution is to qualify the first two conjuncts by temporal terms:

$$(F(a) \ \text{at} \ t) \ \& \ (G(a) \ \text{at} \ t^*) \ \& \ \text{not} \ (t=t^*).$$

where t and t^* stand for different positions in the time-series. To specify a change, a must name the same object at t as at t^* , because if it did not, then we would have just two different objects instantiating different properties at different times. If there was a slim rabbit in the clearing yesterday, and a fat rabbit in the clearing today, then yesterday's slim rabbit has not changed its shape just because there is a fat rabbit in the clearing today. The statement 'the rabbit that was in the clearing yesterday has turned fat' is true if and only if the *same* rabbit is first slim and then fat. The problem is that this appears to violate Leibniz's Law of the *Indiscernibility of Identicals*, which says that for any x and y , if x is identical to y , then x and y have all the same properties. If the rabbit in the clearing yesterday was slim, and the rabbit in the clearing today is fat, and

yesterday's rabbit and today's rabbit are one and the same rabbit, then it must be (all over) slim *and* (all over) fat. But no thing can be both all-over slim and all-over fat, because these properties are incompatible. So, necessarily, the rabbit yesterday and the rabbit today cannot share the same properties and according to Leibniz's Law, this makes yesterday's rabbit and today's rabbit two different objects. But if that is the case, then we have failed to describe a case of change.

Lewis (1986, p.203-4) presents three different solutions to the problem of change, or the '*problem of temporary intrinsics*' as he calls it. I will call these solutions 'the temporal part solution', 'the relational solution' and 'the presentist solution'. Lewis' favoured solution, the temporal part solution, is based on what he calls *perdurantism* - the idea that objects persist through time by having (multiple) temporal parts. The rabbit for example has a nose, feet, ears and so on; but it also has a temporal part 'rabbit-yesterday' and a temporal part 'rabbit-today'.⁴ Temporal parts can be qualitatively distinct, just as spatial parts of the same object can be qualitatively distinct. That is to say, 'rabbit-yesterday' can be slim, and 'rabbit-today' fat, just as the rabbit's left ear might be longer than its right ear. The temporal parts solution explains change with the fact that objects have qualitatively different temporal parts. In other words, objects persist, or *perdure*, when they have more than one temporal part, and they change when these parts vary intrinsically.⁵ The problem of change is avoided, because there is no contradiction involved in having a thin temporal part and a fat temporal part, just as there is no contradiction involved in having a thumb that is shorter than the index finger.

The 'relational solution' to the problem of change⁶, is to say that apparently monadic intrinsic properties, such as slimness and fatness, are in fact relations to times.⁷ According to the relational solution, for the rabbit to change from slim to fat is for it to bear the relation of 'slimness-at' to some time and the relation of 'fatness-at' to another time. More generally,

$$\text{for } a \text{ to change from } F \text{ to } G \text{ is really for } a \text{ to bear the relation } 'F\text{-at}' \text{ to } t \text{ and the relation } 'G\text{-at}' \text{ to } t^* \text{ for some } t \text{ and } t^* \text{ such that not } (t=t^*).$$

⁴ More precisely, if objects have temporal parts, then every object has a temporal part at each moment during which it exists, just as every object has a spatial part at each space point that it occupies.

⁵ Perdurantism has been defended among others by Lewis (1971, 1976; 1986), Armstrong (1980), Heller (1984) and Le Poidevin (1991).

⁶ The label 'relational solution' is taken from Hawley (1998).

⁷ Among the adherents are for the relational solution of change are for example Mellor (1981, 1998) (he changed his mind in 1998 Real Time II), and Van Inwagen (1990a).

Bearing the slimness-at relation to one time and the fatness-at relation to another time is not incompatible, just as being a friend of Tom and a foe of Tim is not incompatible (cf. Rodriguez-Pereyra 2003, p.194). There are several different variants of the relational solution. For simplicity and clarity reasons I will focus on the ‘F-at’-solution, but nothing here hangs on this specific one.⁸ The relational solution is popular among so-called *endurantists*, because they reject the idea that objects have temporal parts.⁹ Instead they claim that objects have only spatial parts. Enduring objects persist through time by being ‘wholly located’ at multiple times, where ‘wholly located’ means that, at any given time in the history of an object, all parts of the objects are located at that time.¹⁰ The relational solution states that at any time during its history, an object instantiates various relations to different times. The rabbit that endures from the 26th February to the 27th February bears at every moment during this period the relation ‘slim-at’ to the 26th February *and* the relation ‘fat-at’ to the 27th February. Given that there is no contradiction in standing in both of these relations, the problem of change seems to be avoided.

Finally, the presentist solution. According to the presentist, only the present exists. The presentist has no problem with intrinsic change. Given that only the present exists, only ever one state of affairs obtains, namely the present state of affairs, whereas past states of affairs do not obtain anymore, and future states of affairs do not obtain yet. For the rabbit to change is for it to instantiate slimness at one time and fatness at another time. However, given that only ever the present time exists, it is never the case that the rabbit is both, slim and fat. Either the rabbit is fat (and was slim) or it is slim (and will be fat). It is never the case that more than one time exists, therefore it is never the case that a thing which changes from F to G, instantiates F and G. The rabbit persists through change by virtue of being the same rabbit existing at successive present times.

In the two next sections I will present my reconstruction of McTaggart’s paradox.

⁸ Other variations of the relational solution include that (1) For a rabbit to change from slim to fat is really for it to bear an instantiation relation to the property slim-at-t and another instantiation relation to the property fat-at-t* and (2) For a rabbit to change from slim to fat, is really for it to bear the instantiation-at-t relation to slimness and the instantiation-at-t* relation to fatness. Both versions are found in Van Inwagen (1990a).

⁹ The terms ‘endurance’ and ‘endurantism’ are also introduced by Lewis (1986). Endurantism has been among others defended by Chisholm (1973, 1976a), Mellor (1981), Lowe (Lowe 1987a, 1988), Haslanger (1989), Van Inwagen (1990a), Merricks (1994, 1999) and Fine (2008).

¹⁰ ‘History’ refers to the period of time that an object ‘occupies’ or ‘spans’ over its life time.

3.3 The problem of Genuine Change

Briefly put, in my reconstruction of McTaggart’s argument I will point out that none of the three solutions to the general problem of change can be successfully applied to Genuine Change, therefore Genuine Change is incoherent. The idea to reconstruct McTaggart’s paradox as a special case of the problem of change is not entirely new. Craig (1998) has expressed a similar idea:

In the same way, I believe that McTaggart’s Paradox is actually a special case of what Lewis has called the Problem of Temporary Intrinsic — a conceptual contextualization of the paradox which, to my knowledge, has gone unnoticed in the philosophical literature. (1998, p.122)

I agree with Craig on several points. I share his view that we can construe McTaggart’s paradox as a special case of the problem of change. Furthermore, I agree with his view that neither the temporal parts solution nor the presentist solution is applicable to McTaggart’s notion of temporal passage and that the relational solution does not work either. But whereas Craig’s argument ends here, I go further. I will argue that the first three claims in McTaggart’s argument are best understood as following from the fact that none of the solutions to the problem of change work. The first claim of McTaggart’s argument is a consequence of the fact that neither the temporal part solution nor the presentist solution are applicable to intrinsic Genuine Change. I will then argue that the second claim is an application of the relational solution to the problem of Genuine Change. I will explain that the relational solution does not work because it eliminates temporal passage. It can only give us passage, if we modify it so that we get relational Genuine Change, which is expressed by claim (3) in McTaggart’s argument. I shall then show that relational Genuine Change leads into an infinite vicious regress. Before I will come to my reconstruction of McTaggart, I shall devote the first sub-section of this section to explain the strategy of my argument. I shall identify certain assumptions on which its success depends and defend them. After that, the section is divided into three more sub-sections, for each of Lewis’ solutions one, where each sub-section explains why the relevant solution does not work for the problem of Genuine Change.

3.3.1 Some required assumptions

Before I come to the problem of Genuine Change, a few words are necessary about the strategy of my argument. The success of my argument depends on three factors. (i) It depends on there really being a problem of change. If there isn't, then my version of McTaggart might not get off the ground. (ii) It depends on whether there is a different strategy from Lewis' three solutions that can be coherently applied to Genuine Change. If so, my argument does not work. (iii) It depends on a certain view about what makes a regress vicious. I shall defend (iii) in detail in section 3.4., but I will say something about (i) and (ii) now.

Some philosophers, (cf. Hofweber 2009), have claimed that there is no (metaphysical) problem of change.¹¹ Hofweber takes the problem of change to be based on the following premise: 'nothing can instantiate incompatible properties'. If the premise is true, then change is impossible, because change requires objects to instantiate incompatible properties. Hofweber argues that the premise in question is ambiguous and can be read in two ways, none of which really expresses a problem for change (cf. Hofweber 2009, p.295 pp):

- (1) Nothing can instantiate incompatible properties at the same time.
- (2) Nothing can ever instantiate incompatible properties, not even at different times.

Hofweber argues that (1) is standardly uncontested, but irrelevant to the problem. In a charitable interpretation of Hofweber's argument, I take him to say that for (1) to be a problem for change, its negation ('something can instantiate incompatible properties at the same time') would have to be necessary for change to occur. However, even though it is non-controversial that change requires an object to instantiate incompatible properties at different times, it is a matter of debate whether this *involves* that the object also instantiates incompatible properties at the same time¹², and thus the negation (1) cannot be necessary for change to occur, and consequently (1) is not a problem for change. If this is what Hofweber means, then I agree that (1) is not a problem for change — however, nobody said that it was. According to Hofweber, what is needed to get the problem started is (2), but it is unclear why one should assent to it in the first place. To put Hofweber's point crudely, change does not require objects to instantiate incompatible properties

¹¹Rychter also argues in a similar vein that there is no problem of change (Rychter 2009). For a paper explicitly against the view put forward by Hofweber and Rychter see (Raven 2011).

¹²I shall come back to this point later in this section.

at the same time, and there is no problem with objects instantiating incompatible properties at different times; we know that things do change- so where is the problem? Hofweber however misses the point. Granted, there is change in the world, and that means that things do have incompatible properties at different times. But to say that the problem of change relies on the acceptance of (1) or (2) is misrepresenting it. The problem of change is based on two other premises, namely

- (I) Change requires the very same object to instantiate incompatible properties at different times.
- (II) Leibniz's Law of the *Indiscernibility of Identicals*: For any x and y, if x is identical to y, then x and y have all the same properties.

The problem is that for change to occur, (I) must be met without violating (II). Hofweber's (2) *would* follow, *if* no solution could be found. But there are various solutions on offer that have to do with the way objects persist in time. Hofweber interprets the problem of change as though we have to accept (1) or (2) for the problem to get off the ground. But the problem of change neither requires (1) or (2), but consists in the challenge to avoid (2). What we have to accept for the problem to get off the ground are (I) and (II), both of which are uncontested truths and jointly express the problem of change. Therefore, *contra* Hofweber, I suggest that there are good reasons to think that there is a problem of change and it is to say how a subject can instantiate incompatible properties while maintaining its trans-temporal identity.

If we do not want to reject the idea of change altogether, and if we do not want to deny non-present times, the challenge is to find a successful strategy to relativise the having of incompatible properties to different times. This can be done by either indexing object parts to times or by indexing the having of properties to times in some way. Even though the literature mentions multiple variations of each solution, all of them fall into one of the three types introduced by Lewis. It is obvious why — once you accept that there is more than one time and that there is change, then the only way to avoid the contradiction that follows from the instantiation of incompatible properties is to relativise the having of properties in some way or other. We can avoid the contradiction by relativising to different objects, but that just gives us qualitatively diverse things. We can avoid the contradiction by relativising to different places, which gives us variation in space, as seen in the different colours of a rainbow. Finally we can

also relativise to different times, and this is how we get change. We can relativise by introducing temporal parts or we can relativise with the help of relations to times or relational properties had in virtue of being related to times. There is no room for another type of solution in logical space.

I have said before that all possible solutions to the problem of change fall into one of Lewis' types. This is not exactly correct. A non-standard solution to the problem of change is to simply accept that change is contradictory. Such a view has been for example advocated by Priest (2006).

in change (...) there is at each stage a moment when the changing item is both in a given state, because it has just reached that state, but also not in that state, because it is not stationary but moving through and beyond that state. (Priest 1989, p.7)

Priest advocates an 'intrinsic account of change', according to which 'change is a matter of the features of the object solely at the instant whether it is changing at the instant', as opposed to an 'extrinsic account' according to which change is 'a matter of a relation to states at nearby instants'(cf.Mortensen). The motivation behind the intrinsic account is that for any change there has to be a time at which that change occurs, which is allegedly not provided for by the external account of change. Consider an interval at which the states of affairs (S) $(F(a))$ obtains and an abutting interval at which the states of affairs (S*) $(\neg F(a))$ obtains. On a standard, extrinsic account of change, a 's change is explained in terms of a being different at different times. For the supporters of the intrinsic account, the problem with this view is that there seems to be no time at which the actual change occurs. But how can there be change if there is no time at which change occurs? Now, if one were to determine such a time, plausibly the boundary instant between the two intervals, then the question is, what needs to be the case at that boundary instant for there to be change? There must be something *about that instant* that distinguishes it from a situation where no change occurs. Boundaries can be *exclusive, partially inclusive, or inclusive*. If the boundary is exclusive, then neither (S) nor (S*) would obtain. However, if at the boundary instant neither (S) nor (S*) obtained, then there is nothing about that instant that distinguishes it from an instant at which no change occurs. In other words, there could be many instants at which neither (S) nor (S*) obtains, but nothing about these instant is such that there must be change. Similarly, if the boundary was only partially inclusive, then, at the boundary instant, either (S) or (S*) obtains. But again there is nothing to distinguish such an instant from any

instant constitutive of the interval during which (S) obtains, or, respectively, during which (S*) obtains. Nothing about that boundary instant makes it an instant at which change occurs. For these reasons, Priest accepts as the only acceptable solution the idea that at the boundary instant both, (S) and (S*) obtain. Therefore the defender of the intrinsic account of change concludes that change is inconsistent.¹³

Somebody who accepts the idea that change is inconsistent, might think that this is bad for my argument. My version of McTaggart depends on the idea that we do not accept the inconsistency in change. It depends on the thought that we need to relativise the having of incompatible A-properties to different times to avoid the inconsistency, but that this leads into a vicious regress. If, of course, one were to find no problem with that inconsistency, then there is no need for the step that leads into the regress.

However, to accept such contradictions is in itself highly controversial, to say the least. But even if one did not shy away at this point, the intrinsic account of change cannot endanger my point. Consider an event E changing from present to past. Assuming the intrinsic account of change, this requires E to instantiate pastness and presentness at the same moment. Analogously for the change from future to present. If this was the case, then each term would *always* instantiate presentness *and* pastness *and* futurity *at the same time*. But all this comes down to is a static block of time where every term is always present, past and future. It is completely unclear how this picture could account for a flow or a *transition* with respect to tense. Apart from the obvious problem of having an intrinsically incoherent reality, objective presentness would be nothing 'special' anymore- every time would always be objectively present (and past and future). This violates one of the core desiderata of any A- or tensed theory – namely that there is always only one time present and that the present time is always a different time (cf. chapter 1.4., 1.5.). Such a theory, it seems, would be in danger of collapsing into a tenseless B-theory of time, according to which every time is present when it occurs. Although on the view under discussion, presentness would still be an 'objective' feature of the world, that is, contra to presentness on the B-theory, a time is present independent of any standpoint of evaluation, it is unclear what the

¹³ Mulligan and Smith also talk about changes that occur at instants, their example being, interestingly, 'punctual mental acts' such as 'rememberings, noticings, recognisings, realisations' as opposed to mental processes and states. (Mulligan and Smith 1986, p.119). I do not know though whether they would also advocate the view that change is inconsistent.

difference between the A- and B-theory so conceived, would really amount to. Note that the view discussed is very similar to Fine's solution (2005) to McTaggart's paradox. According to Fine, if we accept that reality is incoherent, then the paradox dissolves. The view describes times as intrinsically coherent sets of present tensed facts that, taken together, result in a contradictory reality. Fine argues that his 'fragmentalism' has an advantage over standard A-theories, because the standard A-theorist is constrained to say that only one time is present and is then confronted with the difficulty of explaining how the present 'moves'.¹⁴ In contrast, Fine argues that fragmentalism has an advantage because it attributes objective presentness to *all* times. That said, I think the criticism made above with regards to temporal passage as inconsistent change apply here as well: If all times are objectively present, then it is hard to see a transition from one present to the other and then the theory appears to be collapsing into a B-theory.

I hope to have sufficiently shown that there is a problem of change and that Lewis three solutions are the only (relevant) solutions available to us. I shall now start with my actual reconstruction of McTaggart's argument. Each of the following sections concentrates on one of the standard solutions to the problem of change and tries to apply it to the problem of Genuine Change.

3.3.2 Genuine Change and the temporal part solution

The problem of change is based on the fact that change requires an object to instantiate incompatible properties. This is the same for Genuine Change. For Genuine Change to occur, terms must instantiate incompatible A-properties:¹⁵

((Present)*a* & (Past)*a* & (Future)*a*) & (pastness and presentness and futurity are incompatible), where *a* is a term in the time-series.

Note that this is a particular instance of McTaggart's first premise:

¹⁴ I will say more about this in chapter 5.4.

¹⁵ As Rodriguez-Pereyra points out (Rodriguez-Pereyra 2003, p.184, footnote1), 'incompatible' has to be understood in the weak sense that the properties in question cannot be had at the same time. The definition is supposed to cover paradigm cases of change, for there might be cases in which a subject can change without incompatible properties being involved (for example a person that changes from having one finger to having two fingers (cf. Rodriguez-Pereyra 2003, p.184). A-properties are by definition incompatible, so the paradigm definition of change applies to Genuine Change.

(1) For all terms T, T is past, present and future.

Now, the obvious move to make for all cases of change is to qualify the instantiation of incompatible properties to different times:

((F)*a* at t) & ((G)*a* at t*) for some t and t* such that not (t=t*).

The question is *how* exactly we are to qualify the having of incompatible properties to different times. Each of Lewis' solutions suggests a different way. The temporal parts solution attempts to avoid the initial contradiction by introducing (as the name says) temporal parts. Unfortunately we cannot apply the temporal parts solution to Genuine Change, because the subjects of Genuine Change are terms of the time-series, and terms, such as moments and (atomic) events, are *by definition instantaneous* (cf. chapter 1.2), therefore they have no temporal parts. Of course it is true that not only instantaneous objects change their A-properties: this year for example was future and will become past. This will not help though. If a rabbit changes from thin to fat, then the temporal parts solution analyses this by saying that the rabbit has an earlier thin part and a later fat part. If this year becomes past though, we cannot analyse this change in terms of 2012 having some present parts and some past parts. This year becomes past, only when all moments constitutive of it become past. Analogously, temporally extended events, like for example concerts, only become past when every moment constitutive of them become past. It follows that the temporal parts solution is not available in the case of Genuine Change.

3.3.3 Genuine Change and the presentist solution

The presentist solution to the problem of change is to say that from the fact that some object changes from F to G, it does not follow that it instantiates F and G. The presentist thinks that only the present (what is present) exists, so when an object is F and then G, then it either *is* (now) F and *will be* G, or it *is* (now) G and it *was* F. Given that the presentist does not believe in non-present states of affairs, there is no incompatibility and thus no problem with change. Unfortunately, the presentist solution cannot be applied to Genuine Change. In McTaggart's framework, the A-series is conceived as an ordering where *all* times co-exist and change with respect to their A-properties. Future times become less and less future, then present, past and

more and more past, which is what I have called Genuine Change. Broad illustrates McTaggart's theory of time expressively as one where we imagine

(...) the history of the world as existing eternally in a certain order of events. Along this, and in a fixed direction, we imagine the characteristic of presentness as moving, somewhat like the spot of light from a policeman's bull's-eye traversing the fronts of the houses in a street. What is illuminated is the present, what has been illuminated is the past, and what has not yet been illuminated is the future. (Broad 1923, p.59)

So, to stay in Broad's metaphor, as presentness 'moves' along the chain of events, each event gains and then loses again the status of presentness. Presentism, on the other hand, is conceived as the view according to which only present times exist. As such it is not compatible with Genuine Change because that presupposes that *all* times exist, just like all houses exist in the quote above. In other words, the presentist rejects the notion of temporal passage as Genuine Change. Instead she has a different notion of temporal passage altogether, which involves coming into existence and ceasing to exist of (present) times (I shall treat the presentist's notion of passage in chapter five). McTaggart did not take presentism into account, and his argument does therefore not target the presentist notion of temporal passage. I will later argue that presentism can escape McTaggart argument (see 5.4.). For now, it suffices to say that the presentist solution is not available to the problem of Genuine Change.

3.3.4 Genuine Change and the relational solution

In this sub-section, I shall explain that the relational solution, applied to Genuine Change, avoids the contradiction inherent in intrinsic Genuine Change. As we shall see though, it also eliminates temporal passage. Therefore it needs to be modified, but this modification leads into McTaggart's infinite regress. I will first explain what the relational solution applied to Genuine Change looks like and argue that it corresponds to the second step in McTaggart's argument. I will support this argument by showing that McTaggart himself understood A-properties as relational properties, in the course of which some confusion about relational A-properties will be clarified. With reference to an argument by Rodriguez-Pereyra I shall then show that the relational solution applied to Genuine Change cannot give us passage and that in order to preserve the notion of passage, we need to understand Genuine Change as relational change. I

demonstrate how the relational solution needs to be modified in order to give us relational Genuine Change and show that the application of the modified relational solution leads to a claim that corresponds to McTaggart's third claim, the claim that leads into the infamous regress.

The relational solution suggests that all changeable intrinsic properties are *relations* to times.

For *a* to change from *F* to *G* is really for *a* to bear the relation '*T-at*' to *t* and the relation '*G-at*' to *t**, where *F* and *G* are mutually exclusive properties and *t* and *t** are ($t \neq t^*$).¹⁶

Change, according to the relational solution, is just the having of different relations to different times. In contrast to the temporal part solution, the relational solution does not require the object to persist over time. Incompatible relations *to* different entities can be instantiated *at* the same time. I might now have the property of being unknown before I was born and the property of being famous after my death. Equally, an event might be present relative to one time and past relative to another, even though it only occurs at one time. Applied to Genuine Change, the relational solution suggests the following:

(RGC)

For a term *T* to change from present to past is really for *T* to bear the relation '*present-at*' to a time *t* and the relation '*past-at*' to a time *t**, for some *t* and *t** such that ($t \neq t^*$, $T \neq t$, $T \neq t^*$).

Analogously,

for *T* to change from future to present is really for *T* to bear the relation '*future-at*' to a time *t* and present-at to a time *t**, for some *t* and *t** such that ($t \neq t^*$, $T \neq t$, $T \neq t^*$).¹⁷

Compare (RGC) to McTaggart's second claim:

(2*) 'For all terms *T*, *T* is present *at* some present moment of time, is future *at* some past moment of time and is past *at* some future moment of time'.

¹⁶ As I said before, the relational solution can be spelled out in different variations. For the reconstruction I will stick to the 'canonical version' (Rodriguez-Pereyra 2003, p.188) as defended for example in Mellor (1998).

¹⁷ Note that term *T* might also be a time. I have just used 'term' as opposed to 'time' for the sake of clarity. The difference between a term and a time, as I have defined it, is that all times are terms, but not all terms times. A time is a moment and the events located at it, whereas anything that occupies a single temporal position might be a term. 'Terms' is thus a more general word than 'time'.

In both cases, the having of incompatible A-properties is qualified to different times. Now, we have seen that Genuine Change, like all change, requires the instantiation of incompatible properties. This leads to a contradiction, unless the having of these properties is somehow indexed to different times. In 3.3.1, I have argued that Lewis' three solutions, though possible in several variants, exhaust the logical space for solutions to the problem of change.¹⁸ In 3.3.2, and 3.3.3, I have shown that neither the presentist nor the temporal part solution is applicable to the problem of Genuine Change. This leaves us with the relational solution for now. The relational solution requires us to interpret (2*) such that A-properties are relational properties or relations had to different times. In other words, (2*) needs to be understood as the application of the relational solution to the problem of Genuine Change.

Roughly speaking, relational properties are properties that are had by objects in virtue of standing in a relation to some distinct thing; my being a daughter for example is a relational property that I instantiate in virtue of standing in the 'daughter of'-relation to my parents; my being of a certain shape is not a relational property, because I do not have it in virtue of bearing some relation.

Support for the view that (2*) understands A-properties as relations comes from McTaggart himself :

Past, present and future are taken to be characteristics which we ascribe to events, and also to moments of time, if these are taken as separate realities. What do we mean by past, present, and future? In the first place, are they relations or qualities? It seems quite clear to me that they are not qualities but relations, though of course, like other relations they will generate relational qualities in each of their terms. (McTaggart, 1927, p.19, §26)¹⁹

¹⁸ They do not entirely exhaust it, as one could also accept that change is contradictory. I have argued independently though that this solution is also does not work for Genuine Change (cf. 3.3.1.).

¹⁹ In the same footnote McTaggart goes on to say that 'even if this view [that A-properties are relations] should be wrong, and they should in reality be qualities and not relations, it will not affect the result which we shall reach.' Here is where I disagree with McTaggart: I think that it is crucial for his argument that A-properties are in fact relations, otherwise we would have to say that Genuine Change is impossible from the outset. The result would be the same, but we would not launch into an infinite regress.

For McTaggart 'being past/present/future' should be understood as relations, which also generate relational properties in the terms, so that when event E stands in the past-at relation to some time t, then E also instantiates the relational property of being past-at-t.²⁰

That said, there is something initially puzzling about the idea of construing A-properties as relations. What is puzzling is the fact that it is usually the B-theory that understands A-properties as relations. In B-terms, an event's being present for example, is understood as that event being present-at some date or occurrence. More precisely, some B-theorists think that the proposition 'E is present' is made true by the fact that E is *simultaneous with* my judgement that E is present.²¹ Analogously, 'E is past' is made true by the fact that E occurred *before* my judgement that E is past, and the proposition 'E is future' is made true by the fact that E will occur *after* my judgement that E is future. All B-theorists want to reduce A-properties to B-relations, even if they vary in how they go about it. A-theorists, on the other side, understand the fact that a certain time is present (or future or past) independently of any temporal perspective.²² It might be confusing that the relational solution, applied to Genuine Change, also requires us to interpret A-properties as relations (or relational properties). That said, the crucial difference between McTaggart's relational A-properties and the B-theorist's relational interpretation of A-properties is that McTaggart's A-properties are *tensed* relations by virtue of the fact that they are borne to times *with A-properties*, as in 'being present at a future time', whereas B-theorists reduce A-properties to *tenseless* relations by virtue of the fact that they borne to times *without A-properties*, as in 'being present at the 12,June'.

I shall now argue that while (RGC) escapes the claim that all terms are past, present and future, it does not give us temporal passage. Therefore, (RGC) needs to be modified so that it expresses relational Genuine Change. This, however, leads into an infinite regress. My criticism of (RGC) is based on an objection by Rodriguez-Pereyra (2003) against the relational solution as solution to the general problem of change. Although I reject Rodriguez-Pereyra's objection with

²⁰ Whether or not relations generate relational properties in their terms is a contentious matter. Mellor (1998, chpt.5) for example denies that there are relational properties. However, I do not think that anything hangs on that question in the light of McTaggart's argument.

²¹ This is known as *token-reflexive account* of presentness. Other such accounts include the *date-analysis*, according to which a token *u* of the sentence-type 'Zeno is sitting down' uttered at *t* is true iff Zeno is sitting down at *t*.

²² Some A-theorists think that only presentness is an absolute property, whereas pastness and futurity are properties that can be reduced to earlier- and later-relations that terms have to the present time. See for instance Bourne (2006a). This makes no difference to the argument though.

regards to the general problem of change, I will argue that it works with regards to the problem of Genuine Change.

In the debate about the general problem of change, Rodriguez-Pereyra (2003, p.186) has criticised the relational solution for eliminating change. The thought is that change requires objects to instantiate incompatible properties at different times, therefore relational change must require objects to instantiate incompatible relations at different times. According to Rodriguez-Pereyra, 'being-red-at t_1 ' and 'being-blue-at- t_2 ' is not incompatible, thus there cannot be any change.

(...) for there to be relational change a thing must bear incompatible relations to the *same* entity at different times, but the Relational Theory fails to provide such a single entity, since on that theory incompatible relations like *green-at* and *yellow-at* are borne to *different* entities, namely *different* times. (Rodriguez-Pereyra 2003, p.192)

Thus, according to Rodriguez-Pereyra, we can only speak of relational change when incompatible relations like green-at and yellow-at are had to the *same* time at different times. There is no incompatibility in being red at one time and blue at another time- consequently, it is possible for something to be always red at that one time and always blue at that other time. But if this is the case, so the idea goes, then we have a static state of affairs and no change. Another way to put Rodriguez-Pereyra's point is this: The relational solution construes A-properties as relations, *but we have not yet relational change*. The relational solution fails to account for change, because for there to be relational change a thing must bear incompatible relations to the *same entity* at different times.

Rodriguez-Pereyra's criticism of the relational solution reminds me of McTaggart's criticism of Cambridge Change (cf. chapter 2). McTaggart argued that having incompatible properties at different times alone does not amount to change. Similarly, Rodriguez-Pereyra objects that the mere bearing of incompatible relations to different times does not amount to relational change. Just as Cambridge Change implies that the poker is *always* hot on Monday and cold on Tuesday, the relational solution implies that the poker *always* bears the relation hot-at to one time and the relation cold-at to some other time. Thus, if we are to preserve the McTaggartian spirit, we ought to agree with Rodriguez-Pereyra and deny that the relational solution amounts to relational

change, just as McTaggart denies that the Russellian analysis amounts to intrinsic change. However, I have argued that McTaggart does not give convincing reasons for why Russell's analysis does not amount to change (see 2.2). This also applies to Rodriguez-Pereyra: it is not clear why the bearing of different relations to different times is not sufficient for relational change. Even though it is true that bearing different relations to different entities does in general fail to characterise change, this is much less obvious if the relevant entities are times. Being taller than Tim and shorter than Tom for example, does not involve any change. But it is not so evident that bearing the relation 'hot-at' to one time and 'cold-at' to another time does not amount to change. Rodriguez-Pereyra demands that in every change there ought to be some contradiction, but in lack of further reasons for this, his demand appears just as stubborn as McTaggart's demand for more than what the Russellian analysis of change has to offer. This being said, it is one question whether the relational solution is a satisfactory analysis of relational change *in general* and a different question whether the relational solution is a good analysis *for Genuine Change*. I claim that although Rodriguez-Pereyra's argument is not a fair criticism of the relational solution in general, it is a successful objection with regards to the relational solution applied to Genuine Change.

For let us apply the relational solution to Genuine Change. The initial problem of change was that intrinsic change requires an entity to instantiate incompatible properties, because when some poker turns from hot to cold, say, then the very same poker instantiates heat and coldness. The relational solution solves this by saying that the poker bears a hot-at relation to t_1 and a cold-at relation to t_2 . Analogously, when some event E becomes past, say, then E must instantiate presentness and pastness. The relational solution solves this by saying that E bears a present-at relation to some time t_1 and a pastness-at relation to another time t_2 . This is expressed by (RGC):

(RGC) For a term T to change from present to past is really for T to bear the relation 'present-at' to a time t and the relation 'past-at' to a time t^* , for some t and t^* such that ($t \neq t^*$, $T \neq t$, $T \neq t^*$).²³

²³ For reasons of clarity and simplicity I use the short version of (RGC) only but I have given the long version at the beginning of this section.

As it stands, (RGC) does not amount to temporal passage. For time to pass, each term needs to change from future to present to past. (RGC), however, is compatible with E being *always* present on Monday and past on Tuesday, just as the relational solution implies that the poker is *always* hot on Monday and cold on Tuesday. Now, what does it mean to say that ‘E is *always* present on Monday’? One way to understand it is that E is always present on Monday because (that) Monday is always present in the A-theoretic “thick” sense, that is, objectively present, independent of any standpoint of evaluation (cf. chapter 1.2). If the universe is such that one time, say a particular Monday, is always objectively present, then we have a “frozen” universe where that Monday is forever present. Temporal passage is incompatible with this interpretation because if time passes, then precisely which time is present changes. If time passes, nothing can be always present.

Alternatively, one might understand the sentence in a B-theoretic way. According to that, E is always present on Monday in the sense that every event is always (at all times) present when it occurs. As such, ‘E is always present on Monday’ amounts to no more than ‘E is always present when it occurs’. The B-theoretic analysis of presentness is incompatible with the A-theory, so if this interpretation were correct, then we would have reduced Genuine Change to a B-theoretic notion. As temporal passage is by definition incompatible with the B-theory, we would have thereby eliminated temporal passage. It follows that both interpretations of ‘E is always present on Monday’ are incompatible with the view that time passes. The relational solution applied to Genuine Change might avoid the contradiction inherent in intrinsic Genuine Change but it cannot give us temporal passage either.

Clearly we need a more robust notion of relational change, which (RGC) cannot provide. At this point we can come back to Rodriguez-Pereyra’s suggestion. According to him, relational change occurs when some thing bears incompatible relations *to the same entity at different times*, thus (RGC) would have to be modified to

(RGC*) For an event E to change from present to past is really for E to bear the relation ‘*present-at*’ to a time t_1 at a time T and the relation ‘*past-at*’ to time t_1 at a time T*:

where E and t_1 , T, T*, are terms of the time-series, $R_{\text{present-at}}$ and $R_{\text{past-at}}$ are incompatible relations, $t_1=t_1$ and $T \neq T^*$.²⁴

But how can E be both present on Monday and past on Monday? The answer is, that E’s being present-on Monday and E’s being past-on Monday needs to be qualified in such a way that E is present-on Monday when Monday is present, and past-on Monday when Monday is past. That is to say, E’s Genuine Change *requires* Monday’s Genuine Change. According to (RGC*), Monday’s becoming past must again be analysed as Monday’s bearing a present-at relation and a past-at relation to the very same time t_n . How is it possible that Monday is past and present at the same time? It needs to be qualified to t_n ’s being present and t_n ’s being past, say. This means that t_n has to change from present to past, which involves its having a present-at relation and a past-at relation to the same time t_m . On pain of contradiction, t_n ’s having incompatible relations at the same time t_m needs to be qualified again with t_m ’s having different A-properties, which requires t_m to change with regards to these properties, which is, of course, analysed in the same way. Thus each term’s change is dependent on the next term’s change. As terms in the time-series can only change with regards to their A-properties (cf. 2.3), (RGC*) is only possible if the times that feature in it are ‘A-times’ (times with A-properties), rather than ‘B-times’ (times without A-properties). This brings us back again to McTaggart’s claim (2*) which states that

(2*) For all terms T, T is present at some present moment of time, is future at some past moment of time, and is past at some future moment of time.

Now, if A-properties are relations that A-terms have to other A-terms (or relational properties instantiated in virtue of bearing a relation with another A-term), and relational Genuine Change requires the instantiation of incompatible relations to the same term, (2*) implies that

every term is
 past-at a future time, present-at a future time, future-at a future time
 past-at the present time, present-at the present time and future-at the present time

²⁴ And, analogously, for an event E to change from future to present is really for E to bear the relation ‘*future-at*’ to a time u_1 at a time T₁ and the relation ‘*present-at*’ to time u_1 at a time T₂, where E and u_1 , T₁, T₂, are terms of the time-series, $R_{\text{present-at}}$ and $R_{\text{past-at}}$ are incompatible relations, $u_1=u_1$ and $T_1 \neq T_2$. I am using ‘event’ instead of ‘term’ just for clarity reasons.

past-at a past time, present-at a past time, future-at a past time

(2*) thus implies what McTaggart explicitly states in the third claim:

- (3) For all terms T, T is present and has been present and will be present and
 T has been future and is future and will be future and
 T will be past and is past and has been past.

As we can see, (3) is just as contradictory as (1) was, so that the bearing of those relations must again be qualified to further different times. But these times also change, which requires them to have incompatible relations to other times, which themselves change and so forth. The crucial step is that relational Genuine Change must involve the having of incompatible relations to the same time, *which requires that time itself change*. The result is an infinite chain of relational changes where each change occurs in virtue of another change.

In a nutshell: step (1), (2*), and (3) of McTaggart's argument can be described as the problem of Genuine Change. Starting with the contradiction inherent in intrinsic Genuine Change (1), we are forced into the relational solution (2*). The relational solution only amounts to passage when it involves the having of incompatible relations to the same term, which needs to be qualified by another Genuine Change of that term. Thus (2*) implies (3), where (3) leads into an infinite regress in which each relational Genuine Change occurs in virtue of another relational Genuine Change.

I want to finish this section by drawing once more the parallel to McTaggart's original argument. The first premise of the paradox states that each term is present, past and future. I have shown that this crucial premise can be derived from two prior assumptions. Firstly, McTaggart thinks that the phenomenon we refer to with the term 'passage' consists of terms changing their A-properties, a specific kind of change that I have labelled 'Genuine Change'. The second assumption is that every thing that changes needs to instantiate incompatible properties, which is then qualified to different times. The difficulty with Genuine Change is that (i) its subjects are instantaneous and (ii) it assumes eternalism, so that neither the temporal part solution nor the presentist solution can be applied. Thus we cannot avoid the contradiction

inherent in intrinsic Genuine Change and are therefore 'stuck' with the first premise, which states that all terms are past, present and future.

- (1) For all terms T, T is past, present and future.

The relational solution attempts to solve the problem by construing change as the having of incompatible relations to different times. Applied to Genuine Change it avoids the contradiction, but it also eliminates temporal passage (RGC). Therefore the relational solution needs to be modified in such a way that we get relational Genuine Change, which requires that each A-term is past, present and future relative to another A-term. This is expressed by McTaggart's (2*):

- (2*) For all terms T, T is present at some present moment of time, future at some past moment of time and past at some future moment of time.

Finally, because all terms undergo relational Genuine Change, (2*) implies McTaggart's claim (3):

- (3) For all terms T, T is present and has been present and will be present and
 T has been future and is future and will be future and
 T will be past and is past and has been past

where (3) requires us, on pain of contradiction, to qualify the having of incompatible relations at the same time to different times. As each term in the series undergoes the same kind of change, the regress is launched.

In the next section I shall explain how the regress ensues and why it is vicious.

3.4 Two arguments for the viciousness of McTaggart's regress

There are many objections to the regress argument.²⁵ One might for example reject McTaggart's concept of temporal passage. I shall ignore these kind of objections for now. Instead I will focus

²⁵ For further discussion of and variations on McTaggart's paradox see for example Broad (1938), Dummett (Dummett 1960), Mellor (1981, 1998), Oaklander (1991, 2002, 2004, 2010, forthcoming), Le Poidevin (1987; 1991,

on the question whether time's passage, as McTaggart understands it, namely as Genuine Change, leads to a vicious regress or not. For simplicity reasons I will say 'Passage' for McTaggart's conception of temporal passage. I shall give two arguments to the conclusion that McTaggart's regress is vicious. Firstly I consider an argument by Smith, which says that McTaggart's regress is not vicious because it does not entail a contradiction. I reject it, arguing that Smith's (1986) criteria for what a vicious regress is are too narrow. Instead I shall adopt Gratton's (1996) characterisation according to which a regress is vicious when a solution to a problematic statement generates the same problem, or fails to avoid the recurrence of the very same problem. After that I consider another objection, which I call the 'Dependency Objection'. The Dependency Objection is based on the view that Genuine Change is a merely relational change, and that all merely relational changes must be brought about by non-relational changes in other things. The idea is that, if such a non-relational change can be found, then the regress could be stopped and would therefore not be vicious. I consider two non-relational candidate changes and reject both. My arguments show that McTaggart's argument is valid: *if* we buy into his premises, then we cannot but fall into the vicious infinite regress trap. That said, I will go on to say in chapter four and five that the lesson to learn from McTaggart is not that temporal passage is incoherent, but that temporal passage cannot be Genuine Change.

I begin with Smith's objection and my rejection of it in the following section. After that, I shall consider the Dependency Objection.

3.4.1 Smith's objection

McTaggart thought that temporal passage leads into a vicious regress because the initial contradiction inherent in Genuine Change, requiring each term to be past, present and future, can never be escaped:

Such an infinity is vicious. The attribution of the characteristics past, present and future to the terms of any series leads to a contradiction, unless it is specified that they have them successively.

This means, as we have seen, that they have them in relation to terms specified as past present and future. These again, to avoid a like contradiction, must in turn be specified as past, present

1993, 1996, 1998), Lowe (1993), Percival (2002), Fine (2005, 2006), Bourne (2006a, 2006b), Tooley (1999, 2000), Savitt (2001), Zeilicovici (1981).

and future. And since this continues infinitely, the first set of terms never escapes from contradiction at all. (McTaggart 1927, p.21)

Contra McTaggart, Smith (1986) has argued that McTaggart's regress is, 'logically unproblematic' (1986, p.383) and therefore not vicious. Smith points out that there is no contradiction because no term ever instantiates incompatible A-properties at the same time. While Genuine Change requires terms to instantiate all A-properties, each level specifies that the properties are had at different times. Thus, Smith asks

How could the [set of terms] *never escape* from contradiction if it *never was* contradictory? (Smith 1986, p.385)

According to him, McTaggart falsely infers from the fact that no term escapes the contradiction *unless* A-properties are attributed to each term at different times, to the fact that Genuine Change *first* involves a contradiction, which is *then* solved by qualifying the having of incompatible properties to different times. This, he says, is an invalid inference,

[f]or a statement of the form, *A unless B* does not entail a statement of the form *A and B*. (ibid.)

Smith argues that McTaggart's regress is not vicious, because it does not generate the contradiction that McTaggart thinks it does. The absence of a logical contradiction though, I shall argue, is not always enough reason to classify a regress as not vicious, or *benign*. For Smith a benign regress 'relevant here' is one

(...) described by a regress of analysandum and analysans, an analysans being a sentence that makes explicit something implicit in the analysandum. (Smith 1986, p.383).

Smith thinks that this characterisation correctly describes McTaggart's regress. The analysandum he has in mind would presumably be the sentence

(1) 'Temporal passage requires that each term is past, present and future',

the analysans the sentence

(2) 'Each term is past at a future time, present at a present time and future at a past time.'²⁶

The idea is that (1) implicitly says what (2) explicitly states, namely that the having of different A-properties is qualified to different times. (2) introduces new times with A-properties, implicitly stating that these new times also have all A-properties instantiated at different times, a claim that is subsequently made explicit with a third sentence (3). By making (2) explicit, (3) needs to introduce further new times, thereby implicitly stating that these new times instantiate all A-properties at different times, which must be made explicit by a further sentence (4) and so forth infinitely, the idea being that every analysans is also analysandum for the next sentence. Smith thinks that the complete analysans is constituted by the entire regress, and that there is no problem at all with that. He concludes from this that McTaggart's regress is a *benign* regress, and adds that

[t]here is no reason why these benign regresses cannot exist in reality. The concept of such a regress is not self-contradictory, and hence able to have instances. (Smith 1986, p.383)

Smith, I think, is correct in claiming that there is no term, at any stage of the regress, that is simultaneously present, future and past. Nevertheless, there seems to be something left out by Smith's characterisation of McTaggart's regress. It is not just the case that each regress stage makes explicit what the previous implies. What Smith leaves out is that each stage *must* make explicit what the previous implies. Each sentence is *in need* of further explanation, because if we were to stop the endless chain of making explicit what is implicit, then we would end up with an explicit contradiction.

Problematic about Smith's argument is not that he claims that it does not involve the contradiction that McTaggart claims it does — here we agree. Problematic is however Smith's understanding of what makes a regress vicious or benign. It seems that for him, a regress is only vicious if it entails a contradiction. I think that this is a too narrow characterisation. To see why, compare for example McTaggart's regress with a regress that is standardly accepted as benign.

²⁶ Strictly speaking, the analysans would be '(Temporal passage requires that) each term is past at a future time, present at a present time and future at a past time or present at a future time, future at a present time and (more) future at a past time, or present at a past time, past at a present time and (more) past at a future time.

One example is a regress introduced by the Greek philosopher Anaxagoras, who argues that 'of the small... there is always the smaller'.²⁷ The regress starts by granting that there is a small thing, from which follows an infinite regress of smaller and smaller things which never ends with a smallest thing. Applying Smith's characterisation of a benign regress, Anaxagoras' regress looks like this: It starts with the assumption 'there is a small thing' and the 'triggering statement' (Gratton 1996, p.204) 'for every small thing there is a smaller thing'. The first sentence then is the claim 'There is a small thing (1)', which, given the triggering statement, *implies* that there is a smaller thing than (1), which is *made explicit* by the second sentence 'there is a smaller thing than (1), namely (2)', which *implies* that there is a smaller thing than (2), *made explicit* by the third sentence 'there is a smaller thing than (2), namely (3)', which *implies* there is a smaller thing than (3), *made explicit* by the fourth sentence 'there is a smaller thing than (3), namely (4), which *implies* there is a smaller thing (4) and so forth. Following Smith, we can describe the regress as a never ending sequence of analysandum and analysans. In contrast to McTaggart's regress though, there is no obvious need for any of the sentences to be explained. At no stage of this regress does it look like we are forced to go on in order to avoid an obviously contradictory statement. In other words, there is a clear difference between McTaggart's regress description and Anaxagoras' regress description, the difference being that the sentences of the former stand in some sort of dependency relations which the sentences of the latter lack. In McTaggart's regress description the coherence of each sentence depends on the next sentence, whereas each sentence in Anaxagoras' regress is perfectly coherent by itself. Smith seems to think that a regress is only vicious if it involves a contradiction. But even though there is no actual contradiction in McTaggart's regress, it is not as harmless or 'benign' as Smith makes it out to be. The difference between the two regresses reveals that Smith's criterion for what a vicious regress is, is too narrow. It seems to me that Smith is too rash in claiming that McTaggart's regress is not vicious.

Gratton (1996) gives a more suitable classification for a vicious regress. Following Gratton, McTaggart's regress is of the 'recurring problems and solutions' type. Such a regress, he says, is vicious either when

- a) a solution to a problem generates the same kind of problem or
- b) a solution fails to prevent the recurrence of the problem,

²⁷ Example taken from (Gratton 1996, p.219).

so that the infinite regress ‘entails an unacceptable result such as a false statement’ (Gratton 1996, p.216-7). Gratton’s characterisation is able to distinguish between McTaggart’s and Anaxagoras’ regress. In McTaggart’s regress, the ‘problem’ is that each Genuine Change requires each term to instantiate incompatible A-properties. The ‘solution’ is that the A-properties are instantiated at different times. As these times also undergo Genuine Change, the problem is generated again. In Anaxagoras’ regress on the other hand, there is *no problem to begin with* — the fact that for any small thing, there is always a smaller thing is not itself a problem, thus there is no solution required. So Gratton’s classification can distinguish between the two regresses, whereas Smith’s fails to do so. Gratton’s classification is therefore more fine grained and thus preferable to Smith’s. McTaggart’s regress is a ‘recurring problems and solutions’-regress of type a), that is the same problem is generated at each level. Therefore it is vicious.

In what follows I consider a different objection to the claim that the regress is vicious. The objection is based on the view that every relational change depends on some non-relational change to occur. I shall discuss it and conclude that it is not successful. I begin by giving a brief outline of the argument, before I proceed to analyse its premises and conclusion.

3.4.2 The Dependency Objection

The objection I shall now consider depends on the view that (i) McTaggart’s regress is an infinite chain of mutually dependent, merely relational changes and (ii) that every relational change depends on some non-relational change to bring it about. Somebody who endorses (i) and (ii), might think that the regress can be stopped in case a suitable non-relational change is found. In that case it would not be a vicious regress. In a nutshell the ‘Dependency Objection’, as I present it, has the following form:

(DO)

- (1) Genuine Changes are merely relational changes.
- (2) Every relational change *ultimately* depends on some non-relational changes to bring it about.
- (3) There can only be change *within* the time-series or change *of* the time-series.
- (4) The only changes *in* the time-series are terms undergoing Genuine Change.

- (5) If there is a non-relational change that could bring the Genuine Changes about, then the regress is stopped. In this case, the regress is not vicious.
- (6) The non-relational change that brings all Genuine Changes about is a change *of* the entire time-series.
- (7) The regress is not vicious.

I have argued for (1) independently (cf. 3.3.4). (3) follows from the nature of change: as change is necessarily temporal, it could not occur outside of time. (4) is given by McTaggart’s assumptions about time (cf. chapter 2). (5) follows from the way I have characterised vicious regresses. If at any stage of the regress there is a solution to the ‘triggering problem’, which does not generate the same kind of problem, then the regress is stopped and therefore not vicious. The proponent of (DO) understands the regress as an infinite chain of mutually dependent relational changes that requires a non-relational change in order to occur in the first place. She then suggests that there is such a change and therefore concludes that the regress is not vicious.

There are two ways to respond to the objection. Firstly, one could reject (2). In that case, (DO) does not get off the ground. Although I do not want to commit myself to (2), I endorse it for the sake of the argument, to show that the objection does not work, even if we accept its assumptions. Secondly, one could reject (6), the move that I call later the ‘Lewisian Solution’, applied to the regress. In that case the regress is vicious because it would consist of an infinite chain of mutually dependent relational changes that could not exist in the first place.

The structure of this section will be as follows:

- (3.4.2.1) Relational changes depend on non-relational changes
- (3.4.2.2) A well-known objection to (MR)
- (3.4.2.3) The Lewisian solution
- (3.4.2.4) Objections to the Lewisian solution
- (3.4.2.5) The Lewisian solution applied to Passage

In the next two sub-sections I will explain (DO), by revealing what motivations one could have to endorse (2). I will argue that defenders of (DO) have no other choice but to defend (6).

Finally I will show that even if one accepts all those assumptions necessary for the objection to get off the ground, it fails.

3.4.2.1 Relational changes depend on non-relational changes

A first intuitive and most general definition of change says that change consists in some thing being first F and then G, where F and G are incompatible qualitative properties. I call this definition general, because it is neutral between different theories and different kinds of change; it captures for example non-relational as well as relational change. A change is relational, when F and G are relational properties and non-relational when F and G are non-relational properties. It may be helpful to understand the distinction between relational and non-relational properties in terms of the distinction between intrinsic and extrinsic properties. Following Lewis (1983, p.111-2) intrinsic properties are properties that all qualitative duplicates must share; not so with extrinsic properties, because those depend on ‘what may be going on outside of [the object]’ (Yablo 1999, p.479). Even though definitions that equate relational and extrinsic properties on the one hand, and non-relational and intrinsic properties on the other have been proven problematic, this shall not be my battleground here.²⁸ For current purposes it suffices to think of relational properties as kind of extrinsic properties, namely such that the having of relational properties depends on something distinct from the object that has them. Consequently, a relational change is a change that depends on some thing distinct from the subject of change.

There are two kinds of relational change. Consider an oak tree, growing taller than the elm next to it. Both trees change relationally, because the relation between them changes. They change from ‘being the same size as’ to, respectively, ‘being taller than’ and ‘being shorter than’. But when the oak becomes taller than the elm, then its relational change involves some non-relational change- it grows taller. Moreover, the oak’s growing *brings it about* that it becomes taller than the elm. There is no such non-relational change in the elm. Even if there was a non-relational change occurring in the elm, it would not be the change that brings it about that the elm becomes shorter than the oak. The elm changes *merely* relationally in virtue of the oak that has grown taller than it.²⁹

²⁸ For further discussion of this issue see Wheatherson and Marshall (2008), Humberstone (1996)

²⁹ Of course we can imagine a case where the elm becomes shorter than the oak because it shrinks. In that case it would be the oak that undergoes merely relational change. It is due to the ambiguity of language that in expressing

Back to temporal passage. In section three of this chapter (cf. 3.3.4) I have argued that presentness, pastness and futurity must be relational properties that are had relative to a time. When a time becomes past, say, then nothing non-relational changes about that time. Think about the event of me writing this today. Right now this event is present, and soon it will be past. However, nothing non-relationally changes about the event when it becomes past. Some philosophers³⁰ think that there is something special about presentness, so that when a time becomes past, it does change intrinsically — for example, objects that are located at that time lose their qualitative properties. Even so, these intrinsic changes do not bring it about that the time becomes past. If anything, then it is the time’s becoming past that brings about these changes. Thus, if Passage is relational change, then it is merely relational change.

Merely relational changes fall under the general definition of change mentioned above. They also fall under Russell’s definition of change, according to which change is just the difference in truth-value of a proposition concerning an entity at one time and a proposition concerning the same entity at another time, where both proposition only differ with respect to the time (Russell 1903, pp.469-73). But even so, there is something fishy about merely relational changes. There seems to be something that is essential to other changes that is lacking in merely relational changes. This is presumably why merely relational changes have also been slightly derogatively called ‘*mere* Cambridge changes’ (Geach 1969, p.321). So what is missing in cases of merely relational change that is not missing in other cases of change? Intuitively, the way to distinguish a merely relational change from another change is to say that its subjects do not *suffer* from any change. Merely relational changes, as Lombard (1978) put it, do not *alter* their subjects:

Perhaps what irks about change with respect to [merely relational] properties is that objects which change in those *respects* do not seem to be any different as a result; they do not seem *altered*. (...) The point about alteration is that though one might say that objects which change [merely] relationally are, in a sense, different before and after they change so, they have not really *undergone* or *suffered* any change; nothing really happened *to* those objects by dint of having changed [merely] relationally. (Lombard 1978, p.67-8)

only the relational change that both trees undergo, it is not immediately clear whether the oak has grown or the elm has shrunk. However, I have defined the example as one where the oak grows.

³⁰ See for example Smith (1993) and Williamson (2000).

Consider the elm again: no feature of it has changed when the oak grows taller than it. The elm has changed, simply because the oak has grown. Similarly, Mellor (1998, p.87pp.) argues that ‘real changes’ are changes that pass the ‘causal test of change’ — they need to have some effect in the thing that instantiates the properties that are supposed to change. The oak passes the test: it grows taller. The elm does not. Consider also the merely relational change of a person becoming famous. The immediate effects of this change are not within the person, but in others that start to think about that person. This is supported by the fact that a person could become famous without being aware of it. If Mellor’s test is plausible, then merely relational changes are not real changes, because they fail to meet the causal criterion.

The intuition that is being expressed is that merely relational changes are not ‘real’ changes; objects that change merely relationally do so in virtue of being related to another object that changes, but they do not suffer from any alteration. Merely relational changes are still changes in some sense though; nothing *in* the object changes, nevertheless something *about* the object changes. What seems to be at the heart of the intuition is that merely relational changes only occur when non-relational changes occur (cf. Lombard 1978, p.74), because they are *brought about* by non-relational changes, that is, they occur in virtue of non-relational changes.³¹ In other words, merely relational changes are ontologically dependent entities: in order to occur, they need other changes to bring them about.

This being so, we have not yet found a way to clearly distinguish merely relational change from relational change and from non-relational change. Think about the oak again- its becoming taller than the elm occurs only because it grows taller (while the Elm stays the same)³². Thus the relational change that the oak undergoes by becoming taller than the elm also requires another change to occur. Different from the elm though, its becoming taller than the elm is brought about by its *own* growing. Compare this to the elm: its becoming shorter than the oak is brought about by the oak’s growing, there is no change within the elm that could have brought its relational change about. Both, relational changes and merely relational changes occur if and only

³¹ I use the sentence ‘x brings y about’ interchangeably with ‘y occurs in virtue of x’.

³² I exclude here the case where the Oak grows taller because it grows faster than the Elm.

if non-relational changes occur that bring them about. The difference is that merely relational changes require changes in *other* objects to bring them about.

We know now how to distinguish relational from merely relational change. Relational changes that are not merely relational changes are brought about by non-relational changes in the very same subject. Merely relational changes are brought about by non-relational changes in a *different* subject. We are still not quite there yet. Lombard (1978, p.74pp.) points out that, *as a matter of fact*, non-relational changes also could not occur without any other change occurring. As Oderberg puts it, a red wall cannot turn green without anything bringing this change about,

for, as the axiom goes, *nemo dat quod non habet*: you cannot give what you do not have. Hence there must be an efficacious cause, such as a painter, which operates to turn the red wall green, his paint and a paintbrush working in the appropriate way. The same goes for all kinds of change: whatever changes or moves is changed or moved by another. (Oderberg 2006, p.104).

The idea is that every change needs a cause, which will itself be some other change. A death for example could not happen without other changes that bring it about. The ‘could’ however is a nomological ‘could’: in worlds where the natural laws hold, people do not die unless their death has been caused by some prior change in them, but it is not *logically incoherent* that a death could occur without any other changes occurring. All changes are caused by another change — but there *could* be a very first cause, not itself caused by anything else. That is to say that the causal relation between any two non-relational changes is a contingent one. The relation between non-relational and relational changes is different. First of all it is not a causal relation. The growing of the oak does neither *cause* the oak to be taller than the elm, nor does it *cause* the elm to be shorter than the oak. Secondly, as Lombard (1978, p.75) correctly recognizes, it is not a contingent relation either. It is for example not *logically possible* for a wife to become widow, without her husband dying. It is not logically possible for a person to become famous, without other people thinking about that person. The reason is that relational changes are ontologically dependent on non-relational changes: the elm changes if and only if the oak changes. Another way to put this is to say that relational facts supervene on non-relational facts, such that the former cannot change

without the latter changing.³³ We can now distinguish merely relational changes from other changes:

Merely relational changes do not alter their subjects. They are ontologically dependent entities that necessarily depend on changes in other objects to bring them about. In that sense we can say that merely relational changes are not real changes.

We can apply this to McTaggart's Passage. We have established that Genuine Change is a form of relational change. More precisely, we have established that Genuine Change must be merely relational change, because when some event becomes past, say, then there is no non-relational change that happens to the event, which brings its becoming past about. Remember that McTaggart thinks that terms in the time-series can only undergo Genuine Change. If Genuine Change is merely relational change, and terms can only change in that way, then the view under discussion is that every Genuine Change must depend on some change in another thing. The problem is, since all ordinary (non-Genuine) change depends on Genuine Change³⁴, there is, on pain of circularity, no other change that could bring a Genuine Change about apart from another Genuine Change. We can now see how, on this view, the infinite regress ensues as each Genuine Change occurs in virtue of another Genuine Change.

If merely relational changes necessarily depend on other changes to bring them about, then the changes upon which they depend should not themselves be merely relational changes. As merely relational changes do not alter anything by themselves, they cannot bring other changes about. Thus, even though a merely relational change may depend on another merely relational change to occur, *ultimately*, it needs to be brought about by a non-relational change. Let us call this claim MR:

(MR) Merely relational changes necessarily depend, directly or indirectly, on non-relational changes to bring them about.

³³ In what follows, when I say that '*a*'s non-relational change brings about *b*'s merely relational change' or that '*b*'s change happens only in virtue of *a*'s change', this should be understood as expressing a dependency relation between *a* and *b* such that *b* changes relationally if and only if *a* changes non-relationally.

³⁴ I explained in chapter two that McTaggart thinks that ordinary (non-Genuine) change is change only because there is Genuine Change.

The objection that I am discussing, (DO), is that the regress is only vicious, if Passage violates (MR). Consider an infinite series of things larger than me and an infinite series of things smaller than me. I grow a centimetre. There are now infinitely many merely relational changes as every thing larger than me and every thing smaller than me changes in relation to my size (from *n* cm larger/smaller than me to *m* cm larger/smaller than me). However, in this case the changes "bottom out" in one non-relational change (my growing).³⁵ This does not seem to happen in the time case. If the regress is vicious, then there is at no point a real, non-relational change that brings the merely relational changes out in the first place. Thus the task of the proponent of (DO) must be to find a suitable non-relational change.

Here is another way to put the problem. Before I have said that there is a sense in which merely relational changes are not real changes. One way to flesh this intuition out is to say that merely relational changes are not constitutive of reality. The problem is that, when temporal passage is supposed to be an infinite chain of merely relational changes, then how can it be constitutive of reality? Given that merely relational changes do not alter anything, nothing in reality seems to be altered by the existence of Passage.

Imagine a world identical to ours. Is it possible to imagine that other world to change only with respect to one person becoming famous? I don't think it is. Such a world would differ from ours in one relational aspect only. What would the distinction between the worlds amount to? One might say that it is true about one world, but not about the other, that some relational change occurred. Assuming that every truth corresponds to some part of reality, the difference in truth-value should correspond to a difference between the constituents of both worlds. There is no such difference between these worlds though — both worlds would still be qualitatively identical.

Let me summarize what we have so far. I have said that Passage is constituted by merely relational changes and that McTaggart's regress is vicious because it starts with an initial problem the solution of which generates the same kind of problem. The objection I am evaluating now, the Dependency Objection (DO), is based on the view that the regress is an infinite chain of mutually dependent merely relational Genuine Changes that require a non-relational change to

³⁵ I am thankful to Prof. Macpherson for providing me with this example.

bring them about. Once a suitable non-relational change is found, the regress proves to be not vicious. This view, in turn, is based on the general principle (MR). To this point, I have explained the motivation that one could have to endorse (MR). The proponent of (MR) thinks that in contrast to other relational changes, merely relational changes require non-relational changes in other things to bring them about. The problem with Passage seems to be that every change in the time-series is a merely relational change that supervenes on other changes in the time-series. Thus within the time-series there is no non-relational change that can bring the changes that constitute Passage about. If no suitable non-relational change is found, then Passage is impossible and the objection fails. Another way to block (DO) is to stop the objection right here by denying (MR). In this case, the objection cannot get off the ground in the first place.

In the next section, I will discuss a problematic case against (MR). However, for the sake of the argument (and without committing myself to (MR)), I shall then see whether a solution usually offered to save (MR) can be applied to Genuine Change. I will argue that even if one were to accept the solution in some cases, it does not work in the case of Passage. Therefore (DO) fails in its own terms.

3.4.2.2 A well-known objection to (MR)

The objection under discussion assumes that McTaggart's regress is an infinite chain of relational Genuine Changes that only bottoms out if there is a 'real' non-relational change that brings the other changes about. In the centre of the objection is the principle that every relational change necessarily depends on some non-relational change (MR) to occur. There is a standard spatial counterexample against (MR). It concerns *external relational changes*. External relations are relations that do not supervene on the intrinsic properties of the relata. External relational changes are extreme cases of merely relational change. Consider two objects, say a cube and a sphere, in an otherwise empty universe, moving away from each other. As cube and sphere move apart, they undergo some relational change, but neither of them changes non-relationally. They undergo external relational change. The difference between relational change, merely relational change and external relational change is the following³⁶: relational changes depend on non-relational changes in the same subject to bring them about. Consider for example the oak's growing taller than the elm, which is brought about by the oak's growing. Merely relational changes are brought

³⁶Note that I use 'relational change' in the sense of 'relational change that is not merely relational change'.

about by changes in the other relatum. Consider the elm's becoming shorter than the oak, which is also brought about by the oak's growing. External relational changes occur without any of the relata changing non-relationally. Consider here the cube and the sphere moving away from each other.

External relational changes are a problem for (MR), for according to (MR), every relational change must be brought about by some non-relational change. However, in the cube /sphere example there seems to be no such change, as the only change that occurs in this universe is the moving apart of the two objects. So according to (MR), it is impossible for the objects to move, but this just seems absurd. Therefore, so the objection, (MR) must be false.

The cube/sphere objection can be easily applied to McTaggart's regress. Genuine Change is an external relational change, because relations like 'past at/present at/future at' do not depend on the intrinsic properties of their bearers. In a dynamic time-series, where each term changes its Λ -properties in virtue of another term changing its Λ -properties, there is no non-relational change to bring the relational ones about. However, one might argue that it would be absurd to deny that there is temporal passage *on these grounds*. We have seen that it is absurd to deny that there is any change in the sphere/cube case, so why should it be any less absurd to deny passage. In other words, if it is plausible to reject (MR) in one case, why should it not be plausible in other cases.

Against that, the proponent of (DO) could say that external relational changes are a type of relational change. They differ from other relational changes in that they do not depend on changes in the relata. This does not mean that they do not depend on any other changes. From the fact that it is not immediately obvious which changes external relational changes depend on, it does not follow that there aren't any such changes. In fact, one might argue that it is more plausible and parsimonious to assume that there are such changes. It is more plausible because external relational changes share the same characteristics as merely relational changes: both leave their subject unaltered and fail Mellor's causal criterion. So if we say *on these grounds* that merely relational changes are ontologically dependent entities that require non-relational changes to bring them about, why should we assume otherwise in the case of external relational changes? Moreover, it is more parsimonious because if we can say that external relational changes are just a kind of relational change, then we do not need to say they are an entirely new species of

change. If this is correct then the task of the proponent of (MR) is to find a suitable non-relational change that can bring external relational changes about. In our concrete case concerning Passage it means that, if (MR) is correct, then the proponent of (DO) has to find a suitable non-relational change to bring Passage about. In the next paragraph, I will present a ‘Lewisian solution’ that the proponent of (DO) might use to defend (MR) in the light of external relational change.

3.4.2.3 The Lewisian solution

According to Lewis (1986), *internal relations* are relations that supervene on the intrinsic nature of their relata taken separately, whereas *external relations* supervene on the intrinsic nature of the composite of the relata taken together:

Some other relations, notably relations of spatiotemporal distance, are not internal; they do not supervene on the natures of the relata. (...) Consider a (classical) hydrogen atom, which consists of an electron orbiting a proton at a certain distance. If we take a duplicate of the electron and a duplicate of the proton, then they needn’t exhibit the same distance- they may not comprise an atom, they may be in different galaxies or different worlds. However there is a different way in which relations of distance do supervene on intrinsic character. If instead of taking a duplicate of the electron and a duplicate of the proton we take a duplicate of the whole atom, then it will exhibit the same electron-proton distance as the original atom. Although distance fails to supervene on the intrinsic nature of the *relata* taken separately, it does supervene on the intrinsic nature of the composite of the relata taken together — in this case the composite hydrogen atom. (Lewis 1986, p.62)

The proponent of (DO) can use Lewis’ idea to come up with a ‘Lewisian solution’ for the challenge posed to (MR) in the spatial case. The thought is that if external relations supervene on the intrinsic properties of the whole composed by the relata, then external relational change might supervene on intrinsic changes of the whole comprised by the relata. Consider again the simple hydrogen atom. The distance between its electron and its proton does not supervene on the intrinsic properties of either of them, therefore a *change* of that distance is not brought about by any change in the proton or the electron. Instead, the external relational changes of electron and proton depend on some non-relational change of the whole atom. In other words, the Lewisian solution is that, if the relation that changes is an external one, then it must be brought

about by a non-relational change of the *whole* comprised by the relata and the relation between them. In the sphere/cube case one could say that when cube and sphere move apart from each other, their change is brought about by the whole composed of sphere and cube, changing non-relationally.

If the Lewisian solution works, then (MR) can be maintained, albeit in a slightly modified version. We then ought to specify (MR) to distinguish between internal relations (relations that supervene on the intrinsic properties of their relata) and external relations (relations that do not supervene on the intrinsic properties of their relata):

(MR*) Internal relational changes necessarily depend (directly or indirectly) on non-relational changes of the relata to bring them about. External relational changes necessarily depend on non-relational changes of the composite of the relata to bring them about.

The question is whether the Lewisian solution can be applied to Genuine Change. Genuine Changes are external relational changes. According to (MR*), they supervene on non-relational changes of the composite of the relata. Whether the solution works for Passage will depend on whether or not there is a suitable composite and a suitable non-relational change that brings Genuine Change about. In the last part of this chapter I will argue that the only plausible candidate change leads into a new regress. But before I will come to that, three objections against the Lewisian solution shall be briefly discussed.

3.4.2.4 Objections to the Lewisian solution

(i) The ontological commitment objection

The Lewisian solution requires that whenever two objects stand in an external relation and change in terms of it, there must be a further object that is composed out of the relata. In some cases this might bring uncomfortable metaphysical commitments with it. In the case of the sphere and the cube for example, we are committed to some object composed of sphere and cube that changes non-relationally. Alternatively one could argue that the space occupied by sphere and cube changes non-relationally and that is what brings the changes of sphere and cube about. The first interpretation commits us to a rather unrestricted view about the composition of objects. The second requires a substantialist account of space, where space is considered as a

concrete entity independent of the objects located in it. Both options might be considered a high price to pay. That said though, note that the price seems less high when the Lewisian solution is applied to Passage. The composite of all relata participating in Genuine Change is not a new metaphysical object, but just the entire time-series.

(ii) The direction of explanation objection

The Lewisian solution suggests that when two objects change their distance, then this change is brought about by a change of the composite of the two objects. This seems to get the order of explanation wrong. Intuitively it is more plausible to say that an atom changes in virtue of its parts moving apart, than the other way round. Or consider the movement of blood in a body. The blood particles change their position in space — they undergo external relational change. According to the Lewisian solution, that change is brought about by an intrinsic change of the whole body. Intuitively this is odd, because the body need not move or undergo any change apart from its blood flowing. Thus to say that the body changes in virtue of its blood moving, is much more plausible than to say that blood flows because the body changes.

(iii) The Russellian objection

Another way to describe the discussion about relational change is in terms of the question whether there are irreducibly relational facts. Consider the elm being taller than the oak; sceptics about such facts argue that the relational fact that the elm is taller than the oak is *reducible* to non-relational facts such as facts about the heights of the elm and of the oak. Here is how Parsons puts it:

Supposing that truths require truthmakers, that true propositions are those which correspond to facts, is there a distinctive domain of facts that make true the relational truths? Or is it rather that, if we had collected the facts required to make true the other truths, the non-relational ones, that we would then have enough facts to make all truths true? (Parsons 2008, p.173)³⁷

³⁷ Parsons assumes the so-called *truth-maker theory*. The truth-maker theory is standardly taken to be a variation of the *correspondence theory of truth* — the idea that every truth corresponds (in a way to be specified by the exact account) to some part of reality (in a way to be specified). The truth-maker theory emphasizes the *truth-maker principle*: for every truth, there is something in reality that makes it true. Standardly, what is made true are propositions, and the truth-makers are facts.

In other words, the question is whether irreducibly relational facts are constitutive of reality. Consider the true proposition p : ‘The oak grows taller than the elm’. If all relational truths require relational truth-makers, then the proposition is made true by the fact that the oak grows taller than the elm. If there are no irreducibly relational facts, then the proposition must be made true by some non-relational fact(s).³⁸ (MR) (and also (MR*)) is motivated by this scepticism towards irreducibly relational facts, because according to (MR) every relational change must be brought about by some non-relational change. In other words, p is not just made true by the fact that the oak grows taller than the elm. Ultimately, it is made true by the fact that the oak grows. In other words, if there are no irreducibly relational facts, then it must be the case that every relational change is brought about by some non-relational change. If there are irreducibly relational facts though, then (MR) and (MR*) must be false.

Russell (1903, p.212 pp) argues that sceptics about irreducibly relational facts cannot account for the asymmetry of certain relations. To take an example of Parsons (2008, p.179), it is true that Canberra is south of Sydney, but it is not true that Sydney is south of Canberra. According to Russell, the *composite* of both cities cannot account for this asymmetry. The objection is that the sceptic about irreducibly relational facts leaves out the ‘sense’ or ‘direction’ of asymmetric relational facts.³⁹ As Parsons observes though, whether Sydney is south or north of Canberra, *does* make a difference to Australia as we know it. In other words, the proposition ‘Canberra is south of Sydney’ is made true by a non-relational fact about the intrinsic nature of Australia in its current location. Note that we do not need to refer to Australia here: it also makes a difference to the composite of Canberra and Sydney whether Canberra is south of Sydney or the other way round. If the proposition that Canberra is south of Sydney would be false, then the fact that falsifies it would be *intrinsically* different from the fact that would make it true (cf.Parsons 2008). In other words, there is something about the *intrinsic nature* of Australia that makes one proposition true and the other false:

Suppose there is such a thing as the state of affairs of Canberra’s being south of Sydney (...). For convenient reference, let’s call this state of affairs “Kim”, and its internal organisation “kimity”.

³⁸ Contemporary philosophers who are sceptic about irreducibly relational facts include Lewis (1986), Hawley (1998) and Parsons (2004).

³⁹ For further discussion about asymmetrical relations, and whether or in what way they have a direction, see for example Fine (2000) and MacBride (2007).

There's a perfectly good proposition that Kim has kimity (...). Moreover, it is Kim that makes this proposition true. For kimity is an intrinsic (...) feature of Kim. (Parsons 2008, p.8)

Parsons thinks that it is a non-relational fact that the state of affairs or composite in question has a certain internal organisation x which accounts for whatever structure that state of affairs or composite has- be that a symmetric or an asymmetric one. The idea is convincing: for every supposedly irreducibly relational structure there is a non-relational property that applies to the whole composed of the relata in virtue of its relational structure. The fact that some whole has a structure x is different from the fact that the same whole has a structure y , though both facts are non-relational. Therefore non-relational facts can account for the asymmetrical structure of wholes.

The discussion I have presented brings by no means a conclusive result about whether there are irreducibly relational changes or not. Although I do find (MR) intuitively convincing, I do not want to commit myself to this view, as a further investigation of this issue leads too far from my focus. The point is that the objections against (MR*) and the Lewisian Solution force the proponent of (DO) to consider which price she wants to pay. Let me quickly summarize the dialectic again. The proponent of (DO) thinks that the regress is an infinite chain of external relational changes that requires a non-relational change to bring the chain about. She claims that if such a change can be found, then the regress is not vicious. I argued that the Lewisian solution is her best shot to find a suitable non-relational change that can bring external relational changes about. Let us, for the sake of the argument accept (MR*) and the Lewisian solution. In the next section I shall show that even then (DO) fails.

3.4.2.5 The Lewisian solution applied to Passage

If there is a plausible candidate for a non-relational change that brings about all Genuine Changes, then McTaggart's regress is not vicious or problematic in another way. However, if we don't find a plausible change, then the regress constituted by Passage is vicious: as by (MR) and (MR*) it is a necessary condition for every relational change (including merely relational and external relational change) to occur that it is brought about by a non-relational change, it seems that, in the lack of such a change, Passage cannot occur at all. Thus, contra Smith, the regress would be far from 'logically unproblematic': it would be impossible. On the other side, if the

Lewisian solution can be successfully applied to Passage, the regress would come to an end because the chain of relational changes would then be grounded in some non-relational change. To successfully employ the Lewisian solution we need to find a suitable whole, which changes non-rationally and thus brings about the relational changes that constitute Passage. Two options come to mind but I shall show that neither of them works.

(I) There are two ways to interpret McTaggart's Passage. One way suggests a static series of times, along which presentness 'moves' like 'the bulls eye of a policeman's torch along a row of unlit houses' (Broad 1923). As presentness moves, times change their A-properties — they become less future, present, past etc. The other way is to describe Passage as the moving along of the time-series along a fixed present. McTaggart thought these two ways to describe Passage were equivalent:

The movement of time consists in the fact that later and later terms pass into the present, or which is the same fact expressed in another way — that presentness passes to later and later terms. (McTaggart 1927, p.10, footnote2)

I think McTaggart is correct in taking these two descriptions as equivalent. Focussing on the latter idea, each time would undergo change with respect to the fixed present.⁴⁰ Now, if *all terms* change with respect to the present, then the *whole time-series* must change with respect to the present. The 'sliding along' of the time-series along the fixed present is the change that the *whole time-series* undergoes, and it is because of that change that all individual terms change. Has the proponent of (DO) avoided the regress? I fear not. The change that the whole time-series undergoes with respect to the present is clearly also a merely relational change. 'Changing with respect to the present', is a change in the relation between the time-series and the present, thus a relational change. We need a non-relational change that brings the relational changes about.

(II) There is another plausible candidate for the referent of the 'whole time-series'. This candidate would comprise both, the time-series *and* the present. We could then say that the composite of the series and the present changes non-rationally, and it is in virtue of this change that Passage occurs. Unfortunately, this will not do either. According to what I have called the

⁴⁰Note that is an odd consequence of the picture that we end up with two time-series: a series of successively ordered times, and a second distinct series with only one term, the present. Let us put this aside.

‘most general definition of change’, change requires its subject to be *first* F and *then* G. In other words, any change in terms of properties is qualitative variation *over time*, which is to say it is an event that itself *takes time* or *occurs in time*. But if the subject of change is time itself, in which time can that change take place? It looks like there is *no time left* within which such a change could occur. Thus either the change is impossible or we have to postulate a higher-order time series in which the change of the first time-series can occur. Now the higher-order time-series better also undergo temporal passage, otherwise the facts that constitute temporal passage are based on or grounded in facts about a static time, which would mean that there are no irreducibly dynamic facts about time. If the higher order time-series undergoes Passage though, the whole thing starts afresh: a chain of Genuine Changes needs to be brought about by the non-relational change of the entire higher-order time-series, which must take place in another higher-order time-series that also undergoes Passage and so forth. In short, any change of the whole time-series would create a new regress involving infinitely many time-series. Such a regress is also unacceptable because firstly, it involves the absurd consequence of infinitely many time-series. Secondly, it falls under type (a) of the previously mentioned criteria for a vicious regress: it is vicious, because at each stage of the regress a problem of the same kind is generated, namely that Passage requires the whole time-series to change, but the whole time-series can only change if we posit a higher order time at which it can change.

To sum up, the defender of (DO) assumes that McTaggart’s Passage is an infinite regress of mutually dependent external relational changes. All relational changes are ontologically dependent entities, so they must be brought about by some non-relational change, but the only non-relational change available would be a change that the whole time-series (understood as the composite of the series and the present) undergoes. Such a change creates itself a vicious regress of infinitely many higher-order times. I conclude that (DO) fails and McTaggart’s Passage is either impossible or vicious.

Let me finish the third chapter with a short recapitulation of the main points. In the previous chapter I have argued that McTaggart understands temporal passage as Genuine Change, that is, change of terms with respect to their A-properties. In this chapter I have argued that McTaggart’s paradox is best understood as the problem of Genuine Change, a special case of the general problem of change. I have then examined whether any of Lewis’ three solutions to the problem of change can be applied to the problem of Genuine Change. The temporal part

solution cannot be applied because the subjects of Genuine Change are instantaneous. The presentist solution cannot be applied because McTaggart assumes an eternalist theory of time. The relational solution does not work with Genuine Change, because it results in a static picture of time. Instead, it needs to be modified such that Genuine Change becomes relational Genuine Change. I have then explained that Passage, construed as relational Genuine Change, leads into a regress. The regress, I argued, is vicious because it is such that each stage requires a next stage to avoid a contradiction inherent in Genuine Change. I then evaluated an objection (DO) which interprets the regress as an infinite chain of mutually dependent merely relational changes that need a non-relational change to bring them about. According to (DO), the regress is not vicious if a suitable non-relational change can be found. The only possible candidate change though, a change of the whole time-series, would launch another vicious regress. The conclusion of this chapter is that McTaggart is correct about temporal passage *understood as Passage*. In other words, the conclusion is that temporal passage should not be construed as Passage as Passage leads into a vicious regress.

The next chapter defends McTaggart’s regress argument against some paradigm objections from the literature and argues that the correct way to reject McTaggart’s argument is to reject his assumptions about time. I shall argue that presentism is the only view that can accommodate a coherent notion of passage.

Chapter Four

Four (unsuccessful) Objections from the Literature

In the last chapter I argued that McTaggart's argument against temporal passage succeeds, as long as we accept his notion of passage as Genuine Change. In other words, I have shown that Genuine Change, change of terms with respect to their A-properties, is either incoherent or leads into an infinite vicious regress. In this chapter I shall present four paradigm objections against McTaggart as frequently found in the literature. I argue that none of them is successful.

In the first section I will present objections that target McTaggart's event ontology. I will argue that objections that focus on McTaggart's event ontology fail to identify the right target. In the second section I will present what I call the 'date-objection'. The date-objection aims to reformulate McTaggart's argument in a way that is supposed to render Genuine Change coherent. I shall show that objections of this type succeed in avoiding contradiction but fail to express temporal passage. The third section is concerned with arguments that claim that McTaggart's paradox results from an incorrect interpretation of the copula in McTaggart's first premise. I will examine three variations of the objection and argue that none of them succeeds. In the last section I shall analyse an objection by Lowe. Although Lowe's aim is not to defend Genuine Change, his objection will help to make my point clear.

In chapter five I shall argue that the only way to avoid McTaggart's paradox is to reject Genuine Change. Instead I propose to analyse temporal passage in terms of change in what exists.

4.1 The red herring

Some philosophers, among them Smart (1949, 1955), have argued that the fault in McTaggart's argument originates from the idea that passage is constituted by changing events. According to Smart, the mistake lies in proceeding from the 'true but un-illuminating' statement that time involves change, to the claim that we cannot use temporal expressions without implying that

events change (cf.1949, p.491). Against that, Smart holds that 'things change, events happen' (1949, p.485). That is, events cannot change, they *are* changes. Changes cannot change themselves, he argues, since the 'concept of change does not apply to them' (ibid.). Smart's thought is that, when we say that such and such an event has become past, we are treating events *as if they were* substances that change. According to Smart, a consequence of this confusion is that we are (mis-)led to think about time in the same way as we think about space.

Substances exist in space; they are related to one another in a 3-dimensional order. Events are in time; they are related to one another in an order of earlier and later. Now if we think about events as changing, namely in respect of pastness, presentness and futurity, we think of them as substances changing in a certain way. But if we substantialise events, we must, to preserve some semblance of consistency, spatialise time. "Earlier than" becomes "lower down the stream". It is thus easy to see how there arises the illusion of time as a river down which events float. (Smart 1949, p.493).

In brief, Smart's argument is that our inclination to spatialise time is due to our 'substantialising' of events. We mistakenly think of time in a space-like manner because we mistakenly talk as if events could change. Substances, for Smart, exist in space, ordered by spatial relations, whereas events exist in time, ordered by temporal relations (cf. ibid.). The former are capable of change, the latter are not. When we express temporal passage in terms of events that change, we cannot help but think of it as a change akin to movement through space, which is where the image of time as 'a river down which events float' originates. According to Smart, this 'shifting of the syntax' (ibid.) is harmless as long as we are aware of what we are doing, but when we forget that we talk in a metaphorical sense, we get all kind of misguided thoughts about time and pseudo problems such as McTaggart's paradox.

Shifted syntax is an interesting linguistic phenomenon, and is at the root of most philosophical mythology. (...) This mythology is in a way harmless if, so to speak, we draw a red line round all our "shifted" talk and carefully avoid mixing it with our unshifted talk. (...) we can draw a line round our shifted talk about the river of time, and make sure not to mix it up with our ordinary unshifted talk; this is the best thing to do when we want to enjoy a hymn like "Time, an ever rolling stream", and there is no reason why we should not sing such a hymn with a clear logical conscience. For most purposes, however, by far the best thing is not to shift our syntax at all, (...), to avoid the temptation to spatialise time or hypostatise events. (Smart 1949, p.493).

According to Smart then, the fallacy in McTaggart's paradox consists in taking the metaphor of the 'river of time' too seriously, which again is due to either a grave misunderstanding about the nature of events, or at least a confused usage of event-expressions.

To me, Smart's argument is not very clear, so let me just summarise it once more before I shall say something in McTaggart's defence. The argument is roughly of the following structure:

- (i) Substances can change, events cannot.
- (ii) Substances are in space, events are in time.
- (iii) To think of events as changing is to think of events as substances.

Conclusion: Substantialising events forces us to spatialise time.

According to Smart, events cannot change but substances can; therefore if we talk of events changing, we 'substantialise' events. Furthermore, events are in time and ordered by temporal relations, whereas substances are in space and ordered by spatial relations. Therefore, if we substantialise events, we thereby 'spatialise' time. In other words, if one takes temporal passage to be a change that events undergo with respect to their A-properties, then one must, to maintain coherency, think of time and temporal passage in a spatial way, for example as of a river down which events float from the future to the present and further and further into the past.

In McTaggart's defence we can argue against premise (i) and premise (ii). Against (i) I shall say that it is not evident to me that events cannot change. One of Smart's reasons seems to be that events can't change because they *are* changes. We can doubt this assumption- all changes are events, but the converse is not so obvious. One might for example allow static events, such as the carpet's being blue or the cliffs of Dover being white (cf. Broad 1923, p.54). Furthermore, even if we think that events are changes, then why could a change not change? As Smart himself concedes, it seems perfectly fine to say 'the becoming grey of his hair became much more rapid' (1949, p.488). In response, Smart says it is the *rate* of the greying rather than the greying itself that changes, although he admits that a rate is defined as a kind of change. Still, the logic of a rate is very different from that of a change, he writes, but as to why and how we are left in the dark. So what is his motivation to say that changes cannot change? Smart thinks of events as changes, and of changes as *actualisations*, where actualisations, as opposed to *processes*, are things that do not

'unfold' in time, which is to say they do not take time. Actualisations can be 'dated not clocked' (a quote he takes from Ryle (1949), that is 'we can give a date but not a running commentary, not even an infinitesimally short running commentary' (1949, p.488). Does Smart think events cannot change because they are instantaneous? I think he must be, even though he claims that actualisations such as winning a race, or reaching the mountaintop neither take time, nor are instantaneous (Smart 1949, p.487). That said, I cannot see how he can avoid saying that actualisations are instantaneous. Surely he would not want to deny that a winning takes place in time- given that actualisations 'cannot be clocked but only dated', it sounds like the distinguishing feature between an actualisation and a process is one of temporal extension. And given that for some thing to change, that thing has to exist over time,¹ I can only understand Smart's argument as saying that some thing that itself takes no time, cannot change. As intuitive as this point may be, it nevertheless completely ignores the fact that McTaggart agrees with the claim that instantaneous things cannot change. This is precisely why he introduces Genuine Change as a *unique* kind of change, the *only* change that terms in the time-series can undergo *despite being instantaneous*.

With regards to (ii), it is not clear why Smart says that 'substances exist in space' but 'events are in time' (1949). Mundle agrees with me on this point — for him, too, Smart's claim 'seems to bristle with difficulties' (1954, p.61). As Mundle writes, Smart's thought that events are in time and not in space is explicable by his constraint view of events as actualisations:

I can understand why Smart should consider that events do not exist in space, for he uses 'event' in a very restricted sense to refer to an 'actualisation' as distinct from a process, *e.g.*, to the winning of a race and *not* to the running (...). But I find it difficult to understand why Smart should deny (and his argument seems to depend on doing so) that substances 'exist in time'. (...) But any statement about the spatial relations between such things (*e.g.*, between a cricket bat and a ball) is incomplete unless it specifies or indicates the date or period in question. (ibid.)

I largely agree with Mundle. I disagree with him on the first point - I cannot understand why an event, even if understood as an actualisation, should not be located in space. Why would anyone think that the running of a race is spatially located but the winning of a race is not? Or, to make the case even more pressing, why would anyone think that the reaching of the mountaintop is

¹ An exception might be coming into existence and ceasing to exist. I will come to these changes in chapter five.

not spatially located? Surely that reaching takes place *at* the mountaintop. If events are where their participants are, then it is plausible that events are at least derivatively spatially located (by that I mean that if the event's participants are spatially located, then events are spatially located in so far as their participants are). I agree with Mundle about the second point in the above quote, that is, about Smart's idea that substances exist only in space. Surely substances, understood as ordinary three-dimensional objects like tables and chairs, are not only in space but also in time, whether one thinks of them as 'wholly located' at a time (or at different times) or as having temporal parts. Now, if one agrees with me that substances and events are both in space *and* time, then Smart's conclusion does not follow. That is to say, even if thinking of events as changing were tantamount to substantialising those events, it would not follow that we thereby spatialise time- because the separation between substances that are in space and events that are in time does not hold.

That said, I do agree with Smart that the problem with McTaggart's argument is the view that time is a series of eternally existing terms along which the present 'moves'. Crucially though, I do not think that this problem has anything to do with events in particular. According to the moving spotlight theory that McTaggart assumes, each and every term undergoes Genuine Change, where a term is anything that is located at a single temporal position. Whether it is an event, a moment or a fact that undergoes the change that constitutes passage is irrelevant- I will show in the next paragraphs that the paradox can be construed just the same. For the same reason I doubt that it is McTaggart's event ontology or the confused 'logic of event-expressions' that brings about his problematic notion of passage. Although Smart reaches the right conclusion in the end, namely that the problem lies with the view of time that McTaggart assumes, he arrives there largely by attacking a straw man, the view that events change. Genuine Change is a change that all terms undergo, not only events and the paradox argument is not dependent on the terms being events. Nevertheless, blaming McTaggart's event ontology for the failure of his argument is an often-found objection in the literature. In the next paragraphs I shall introduce another example of this sort.

Prior (Prior 1968a), Christensen (1974) and Levison (1987), also object to McTaggart's argument on the grounds of its event ontology. According to Prior,

events do not exist at all; only *things* exist- events are just what things do and what happens to

them. (Prior 1968a, p.16)

Prior argues that sentences, which seem to ascribe changing A-properties to events, can be rewritten without quantifying over events (and A-properties) at all. He considers the following example (*ibid.*):

My falling out of a punt has receded six years into the past.

The above sentence suggests that there is an event which became past six years ago. According to Prior, we can reformulate it, *without change in truth-value* to the following sentence:

It is now six years since it was the case that I am falling out of a punt.

The fact that it is possible to reformulate sentences that predicate pastness, presentness and futurity of events without change in truth-value into ones that do not quantify over events, suggested to Prior that we are not committed to events and that there is no need for predicates that appear to name A-properties. Instead, all work can be done by *sentential tense operators*, such as 'it was the case that' or 'it will be the case that', that modify the whole sentence.² Similar to Smart, Prior's point against McTaggart is that the regress only gets off the ground when we suppose that passage consists in events undergoing some special sort of change. But we do not need to quantify over events at all, therefore the argument does not get off the ground.

Prior's own favoured theory of time, presentism, does indeed avoid McTaggart's paradox but not because it avoids commitment to events.³ Again, the root of the problem with McTaggart's argument is not related to events but to McTaggart's moving spotlight or hybrid theory, according to which we have an eternalist time-series that is nevertheless dynamic. Any criticism of McTaggart that focuses on events is, to borrow Bourne's expression, focussing on a 'red herring' for the same contradiction survives when we replace talk of events with talk of

² Strictly speaking, there is also the operator 'it is the case that' but Prior thought that the present tense operator is redundant, for to say 'it is the case that p' is the same as saying that p. This view is reminiscent of the so-called 'redundancy theory of truth' which Prior also supported, according to which saying that 'p' is true is equivalent to saying that p, so that the truth predicate can be eliminated without a loss (cf. Glanzberg 2009).

³ I will come back to why and how presentism in general gets around McTaggart's argument in chapter five.

facts, see (Bourne 2006a, p.78).⁴

Take for example the fact that I am writing. According to McTaggart, that time passes implies

(1)

The fact that I am writing is past, present and future.

Given that pastness, presentness and futurity are mutually exclusive properties, (1) is contradictory. We need to avoid the contradiction with (2):

(2)

The fact that I am writing is present at some present moment of time, is future at some past moment of time, is past at some future moment of time

However, as time passes, the 'moments of time' at which the fact is past, present or future also change their A-properties. Thus (2) implies (3):

(3)

The fact that I am writing is present at some present moment of time, present at some past moment of time and present at some future moment of time and
 the fact that I am writing is future at some past moment of time, future at some present moment of time and future at some past moment of time and
 the fact that I am writing is past at some future moment of time, past at some present moment of time and past at some future moment of time.

Or, differently put,

The fact that I am writing is (now) present and has been present and will be present and
 The fact that I am writing has been future and is (now) future and will be future and
 The fact that I am writing will be past and is (now) past and has been past.

⁴ Le Poidevin (1991, p.24-31) and Mellor (1998, p.78-81) have both formulated versions of McTaggart's paradox that do not feature events.

(3) is again contradictory, thus would have to be qualified to further times that undergo Genuine Change. The regress is launched. As we can see, the regress argument can be construed without mentioning events. The important stepping stone for McTaggart's argument is not what kind of term undergoes Genuine Change- it is rather that *every single* term must undergo Genuine Change, where *anything* that occupies a temporal position is a term and can set off the regress. It is true that McTaggart himself does not consider objects as terms because for him, the fundamental entities in time are events. But his regress argument does not rely on this assumption.

To conclude, I argued that the event objection against McTaggart's argument is unsuccessful because, contra Smart, (i) it is not clear why events cannot change, (ii) even if events could not change in general, it is not clear why they could not undergo Genuine Change, and finally (iii), because McTaggart's argument does not rely on events at all.

4.2 The date objection

Sorabji (1983) presents another type of objection that is, in one way or other, frequently found in the literature. I will call it the 'date-objection'. The date objection says that terms are never past, present and future simultaneously, but at different *tenseless* times (B-series times without A-properties).⁵ Although there is no contradiction in attributing pastness, presentness and futurity to terms successively, we have seen that it leads into a vicious infinite regress if we attribute the having of A-properties to different *tensed* times (times of the A-series) (see chapter 3.4). Sorabji's proposal is to attribute the having of A-properties to different tenseless times, which on the one hand avoids contradiction and on the other hand avoids the regress because tenseless times are not subject to Genuine Change.

Sorabji's proposal, I argue, does not work. To say that a term is future at one time, present at another and past at yet another, is a step we should by now recognise as what I have called the 'relational solution for Genuine Change'. If these times are tensed, we plunge into the regress, for times change their tenses. But if they are tenseless, as Sorabji proposes, then we end up with

⁵ As 'tenseless times' I understand times that instantiate only B-relations, relations of earlier than, later than and simultaneous with. 'Tensed times' are times that instantiate B-relations by virtue of instantiating A-relations, where A-relations are relations that are always instantiated between an entity and the present time (e.g. 'two weeks ago, or five years hence').

a circular account, because tenselessly related terms *presuppose* temporal passage on McTaggart’s account (cf. Oaklander 1987, see also chapter one). Remember that McTaggart assumed that there is only a non-temporal ordering of events, the C-series, which *appears* to us as A-series. It is only because we experience the terms of the C-series *as* being past, present and future that the terms also appear to be earlier and later than each other. In other words, on McTaggart’s picture, the B-series presupposes a dynamic A-series. That said, even if one defended an A-theory that allowed for an independent B-series,⁶ the objection would not work. For let us go through the reconstructed regress argument once more, this time specifying that terms have different relations to different *tenseless* times. Just as before, when we construe A-properties as relations had to times, we get

- x is future = x is future-at t_1
- x is present = x is present-at t_2 .
- x is past = x is past-at t_3

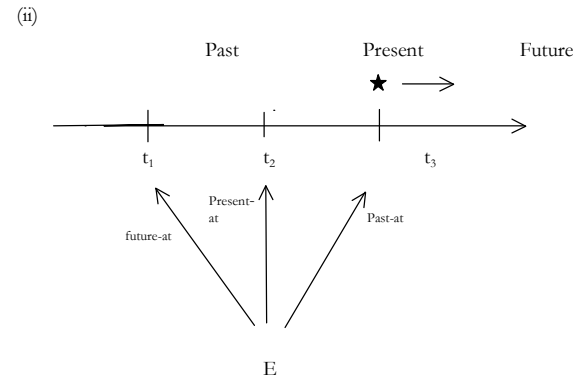
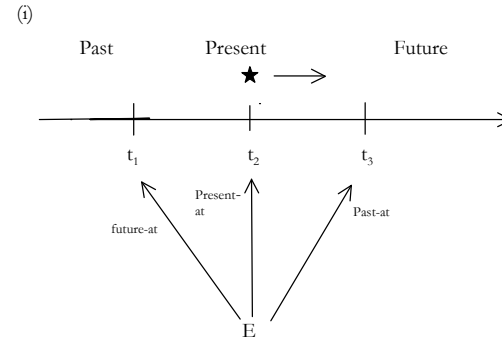
for some t_1, t_2 and t_3 , such that $t_1 \neq t_2 \neq t_3$ and t_1, t_2 and t_3 are tenseless times such as dates.

In the last chapter we have applied the relational solution by construing A-properties like ‘being past’ as relations to *tensed* times as in ‘being past-at some *future* time’. Sorabji’s suggestion is to construe A-properties as relations to *tenseless* times, as in ‘being past-at the 12th October 2012’. I have argued before i) that within the time-series each Genuine Change occurs in virtue of another Genuine Change (cf. chapter 3.4). Now, consider the states of affairs (S) ‘the apple is (now) green’ which obtains on the 11th October 2012. According to Sorabji’s solution, we can express the fact that time passes by saying that (S) is present on the 11th October, past on the 12th, and future on the 10th. It is true that we have avoided a contradiction because (S) has the incompatible A-properties successively. Nevertheless, this is a static scenario: Thus construed, (S) is *always* present on the 11th and past on the 12th. There cannot be any temporal passage because in order for (S) to *become* past, *the 11th October 2012 needs to become past*. But the 11th October 2012 is a term of the B-series, and B-series terms are defined such that they are not

⁶ See for example Zeilicovici (1981). Some A-theories accept irreducibly tenseless relations such as earlier than and later than. Bourne for example defends a presentist theory, but defines notions of past and future in terms of earlier than the present and later than the present. (2006a).

tensed, and consequently they cannot change with regards to their tense. Here is a diagram that will hopefully help to illustrate the point:

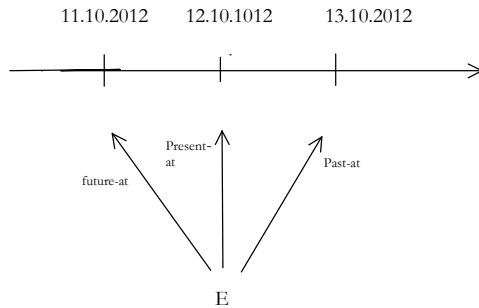
Diagram 1: McTaggart’s view:



(i) (or respective (ii)) do not illustrate passage. They illustrate the relations that E has to different times at one moment. (i) and (ii) are static. Passage is constituted by the change from (i) to (ii). The paradox is constituted by the fact that E is present at a present time and present at a past time.

In contrast, see here Sorabji’s proposal:

Diagram 2: Sorabji's suggestion:



In contrast to diagram (1), diagram (2) does not illustrate passage — it merely illustrate the different relations that E has to different times. Given that the times do not change, these relations do not change either.

In diagram (1) times change by gaining and losing presentness (symbolized as star moving along the time axis). The change brings about the relational change that events undergo with regards to their A-properties. In diagram (2) the times do not change. As a consequence, there is no change to bring about the Genuine Change of. In other words, Sorabji has merely succeeded to describe a B-theoretic scenario that appears to be tensed but in fact, he has reduced tensed relations to tenseless ones. What it means on this view to say that (S) is present at some B-time, is that (S) is located at some B-time (or that (S) is simultaneous with some B-time). To say that (S) is past at some B-time just means that (S) is located before that time, and to say that (S) is future at some B-time, is to say that (S) is located after that time. B-relations such as earlier, later (before, after), simultaneous to, do not change: we can look at a calendar and see that the 11th October 2012 is earlier than the 12th October 2012, and this is always true- but we wont find out whether the 11th October 2012 is past, present or future, just by looking at the dates. If the 11th October 2012 has no A-properties, then it cannot become past, so (S) cannot become past. It turns out that the date objection analyses A-relations in terms of B-relations. It is therefore no surprise that we find ourselves in a static rather than dynamic scenario. In other words, Sorabji has not succeeded in describing passage, instead he has presented us with a static tensed block. To put the point more generally, a term x that is present at some time t can only become past if t becomes past, say. But if t is supposed to be a term of the B-series, then it cannot undergo Genuine Change (because it has no A-properties). Given that x's change is dependent on t's change, and t can't change, x

cannot change either. Thus if it is the case that x is future at t_1 , present at t_2 and past at t_3 , and t_1 , t_2 and t_3 are tenseless times, then x is *always* future at t_1 , present at t_2 and past at t_3 . But, as Lowe puts it,

it simply is not timelessly true to say that e is happening now in 1986, where e is a present event- said in 1987 this is simply false. (Lowe 1987b, p.67)

For passage to occur, terms have to undergo Genuine Change, but the date solution makes that impossible. It avoids the contradiction by qualifying the having of incompatible A-properties to different times, but it also eliminates passage- the date objection has thrown the baby out with the bath water.

4.3 The copula objection

Some A-theorists like for example Broad (1938, p.315) and Savitt (2001) have attacked McTaggart's argument by claiming that they are not committed to go from

- (1) E is past, present and future
to
(2) E will be past, is present and was future

because, rightly understood, (1) is not contradictory. More precisely, the objection is that (1) is ambiguous, due to the ambiguous understanding of the *copula*, that is the link between subject and predicate ('is'). McTaggart's opponents claim that (1) is only contradictory if E possesses incompatible properties *at the same time*, which is only guaranteed if we understand the copula *tensed*, as in

- (1*) E *is now* past and *is now* present and *is now* future.

However, no A-theorist wants to say that every event is now past, present and future, so the objection goes, so why should an A-theorist accept (1*) as a reading for (1) (cf. (Savitt 2001, p.266)? Instead, A-theorists claim that there are other readings of (1) that are perfectly coherent. The success of this objection depends very much on these other readings. If there is one that

avoids the contradiction, while also maintaining the notion of passage, the objectors have won. In that case there is no need to go from (1) to (2), thus no need to plunge into the regress. In the following sections I will go through the various possible readings of (1) and I shall show that there is no reading that can coherently express temporal passage.

4.3.1 The neutral copula

Compare the two sentences

'It *is* snowing.'

'Seven *is* a prime number.'

In the first sentence, the copula 'is' is tensed- it indicates that it is snowing *now* (it *is now* snowing). In the second sentence the copula is tenseless or *neutral* in the sense that it does not indicate any time. As Mellor puts it, the neutral copula 'adds no temporal information and is present only to give the sentence a verb, however vacuous' (Mellor 1998, p.77). Using 'BE' instead of 'is' for the neutral copula, 'it BE rainy in London' indicates the place but not the time of the rain, whereas 'it BE rainy at three o'clock' indicates the time but not the place (Savitt 2001, p.267). Applying the neutral copula reading to (1), we get

(3) 'E BE past' 'and E BE present and 'E BE future'.

Savitt correctly observes that if we take the copula to carry no temporal information whatsoever, then the only temporal information is given by the predicates. If the only temporal information is given by the predicates, then we remain with a contradiction because pastness, presentness and futurity are mutually exclusive and nothing is added to or changed in the initial claim. As Savitt puts it, given such a minimal characterization,

it is tempting to think that the predicate restores precisely the temporal information subtracted from the copula. (2001, p.268)

This is correct. The neutral copula does not free McTaggart's opponent of the contradiction, because (3) is just as contradictory as (1*).⁷ That said, Savitt rightly points out that if we grant the Λ -theorist that she has no reason to accept (1*), then we also have to grant her that she has no reason to accept (3) (cf. *ibid.*). In any case though, the objectors have not achieved their goal to give a coherent reading of (1).

4.3.2 The existentially quantified copula

According to Savitt (2001), an alternative way to understand (1) is as *implicitly quantifying* over different times. That is, in order to make (1) palatable, Savitt thinks that we have to understand the copula as 'existentially quantified copula' (2001, p.268) tacitly saying that each term is at *some* time past, at *some other* time present and at *some other* time future. Using 'IS' for the existentially quantified copula, the claim is that (1) is to be read as

(4) E IS past, present and future =

There are at least three times, t_1, t_2, t_3 , such that E BE past at t_1 , E BE present at t_2 and E BE future at t_3 , for some t_1, t_2 and t_3 , such that $t_1 \neq t_2 \neq t_3$.

According to Savitt, there is no contradiction involved if we understand the copula in the existentially quantified sense because it is not contradictory to have incompatible properties at different times.

(4) is a familiar strategy: it involves relativising the having of mutually incompatible properties to different times, an approach that I have called the 'relational solution' before (cf. chapter 3.3). Note though, that (4) still needs some clarification. The question is whether (4) implicitly quantifies over tensed times, or over tenseless times. If the times are tensed, then McTaggart's regress is immediately reinstated, because each of these times also change with respect to their Λ -properties, so that we are back to (1) (see chapter 3.3. and 3.4.). To spell it out, as time passes,

⁷ Alternatively, one might also think that (3) is neither true nor false because it is incomplete: it lacks the information *when* E is past, present or future. I am grateful to Prof. Correia for this note.

(4) E BE past at t_1 , E BE present at t_2 and E BE future at t_3 .

implies

(5)

E is past at t_1 and E was past at t_1 and E will be past at t_1 and

E is present at t_2 and E was present at t_2 and E will be present at t_2 and

E is future at t_3 and E was future at t_3 and E will be future at t_3 ,

where the underlined verbs are tensed.

We are stuck with a contradiction again, unless we qualify to further times, in which case the regress is launched. On the other hand, if the times (that have been tacitly quantified over) are tenseless, then we eliminate passage, as shown in section (4.2) of this chapter. As I explained there, the idea is that if E is past, present and future at different tenseless terms like dates, then (4) is perfectly compatible with it being *always* the case that E is present on 12th October, past on 13th October, and future on 11th October, for the dates do not change, therefore there is no change that could bring E's relational change from future to present to past about. Here is yet another way to put it. To avoid contradiction, terms must have all A-properties successively, but this does not help to avoid McTaggart's paradox because if time passes, then terms *change* these A-properties and it is the attempt to say *when* they change that leads either to contradiction or regress (cf. Bourne 2006a, p.74), or to the elimination of temporal passage. I conclude that the existentially quantified copula does not help because, depending on how it is spelled out, it either leads straight back to the paradox, or eliminates passage completely.

4.3.3 Sellars' copula

Yet another reading of the copula has been introduced by Sellars (1962). For Sellars, 'x is ϕ at t', tenselessly understood, should be read as

Either x was ϕ at t or x is ϕ at t or x will be ϕ at t,

where the underlined verbs are tensed.

Savitt suggests applying Sellars' copula to the tensed understanding of (4) ('tensed understanding' being the version that implicitly quantifies over tensed times). This results in (6):

(6)

E is past at t_1 or E was past at t_1 or E will be past at t_1 and

E is present at t_2 or E was present at t_2 or E will be present at t_2 and

E is future at t_3 or E was future at t_3 or E will be future at t_3 ,

where the underlined verbs are tensed again.

According to Savitt, 'it is easy to see that no McTaggart-style contradiction is generated by Sellars' copula' (2001, p.270). This is correct. That said, (6) does not capture temporal passage either. Instead, we now have a conjunct of disjuncts, which removes the paradox but does not constitute change. Each of the disjuncts describes a static states of affairs which itself does not change. Differently put, (6) says that E could either be present or past or future, but for passage to occur, E should be *changing* from future to present to past, which requires E to be present and past and future.

As we have seen, none of the suggested alternative readings to (1) avoids McTaggart's paradox. They either cannot avoid the initial contradiction or fail to describe temporal passage. The conclusion is that the copula objection to McTaggart fails.

4.4 Lowe and the 'indexical fallacy'

For Lowe (1987a, 1993) it is particularly McTaggart's premise (2)

(2) 'E will be past, is present and was future'

that is troublesome. Although there is a 'germ of truth' (Lowe 1987b, p.66) in what (2) is supposed to express, for Lowe the problem arises with McTaggart's introduction of 'iterated' or 'compound' tenses such as 'past in the future' ('futurely past') or present in the past (pastly present) and so forth. According to Lowe, it is as much an 'indexical blunder' (1987b, p.64) to say that some thing is 'present in the future', as it is to say that some thing is 'here over there' (1987b, p.65). He suggests that the only meaning we can give to sentences involving iterated

tenses like 'E is present in the future' is that there will be a time when the sentence 'E is present' is true. Thus instead of (2), we could only say that if we *are (now)* truly describing E as present, then it may also hold that we *will be* truly describing E as past, and that we *were* truly describing E as future (1987b, p.63). Given his rejection of iterated tenses, Lowe denies that (2) expresses temporal passage. If we reformulate (2) in Lowe's terms though, the very same problem as in the original paradox reappears. The original paradox was that

(2) E will be past, is present and was future

also entails that E is past and will be past, was present and will be present, will be future and is future. The initial contradiction is reinstalled, unless we relativise to further times but that step leads into an infinite vicious regress. In Lowe's terms (2) can be reformulated as

(2L) It will be true that E occurred, it is true that E occurs and it was true that E will occur

but given that time passes, not only *is* it true that E occurs, but it also *was* true that E occurs and it *will be* true that E occurs, it also *was* true and *is* true that E occurred, and it also *is* true and *will be* true that E will occur. Altogether we get nine differently tensed truth-conditions, stating when E occurs, did occur and will occur is true, was true or will be true:

(It is now true that 'Np' & it was true that 'Np' & it will be true that 'Np') &
 (it is now true that 'Pp' & was true that 'Pp' & it will be true that 'Pp') &
 (it is now true that 'Fp' & was true that 'Fp' & it will be true that 'Fp'),
 where 'P'= it was the case, N= it is the case and F= it will be the case.

The conjuncts are contradictory, so we have not managed to avoid McTaggart's argument. As Mellor and Le Poidevin put it,

(...) Lowe replaces the compounding of tenses in an object-language with a hierarchy of simply tensed meta-languages. But as one of us has observed elsewhere [(Mellor 1981, p.96)], such a hierarchy of meta-languages generates a regress exactly analogous to that of the compound tenses it replaces. The incompatible properties are now not tenses but the truth-values true and false. (Le Poidevin and Mellor 1987, p.536)

Resorting to a meta-language does not avoid the paradox. Lowe concedes this, but his point is rather a different one. It is that once (2) is well-formed, it is evident where the mistake lies. The fault, he argues, lies in formulating (2) as a *conjunction*, rather than a disjunction or, more precisely a *conjunction of disjunctions*. To render (2L) fully coherent, we must formulate it such that

(2L.*)
 (It is now true that 'Np' *or* it was true that 'Np' *or* it will be true that 'Np') &
 (it is now true that 'Pp' *or* was true that 'Pp' *or* it will be true that 'Pp') &
 (it is now true that 'Fp' *or* was true that 'Fp' *or* it will be true that 'Fp').

Lowe claims that with this

the threatened contradiction evaporates and McTaggart's paradox dissolves. (Lowe 1993, p.326).

Lowe is correct. Yet again, although (2L.*) is coherent, it fails to express temporal passage. Just as with the date objection (cf. 4.2.) or Sellars' copula (cf. 4.3.3), (2L.*) describes a perfectly *coherent, but static* state of affairs. Le Poidevin (Le Poidevin 1993, p.167) nicely illustrates this point with the spatial analogue to (2L.*):

(SP)
 (It is here true that 'Hp' *or* it is there true that 'Hp') &
 (it is here true 'Op' *or* it is there true that 'Op')
 where Hp= 'it is the case that p occurs here' and Op = 'it is the case that p occurs over there'.

While (SP) appears 'entirely uncontroversial', he writes, it does not represent the proposition that there is some spatial counterpart to temporal passage. Given that (2L.*) is the exact counterpart of (SP), it follows that (2L.*) does not represent the proposition that there is passage either (cf. Le Poidevin 1993, p.167).

This being said, it would be wrong to accuse Lowe of committing the mistake that Le Poidevin appears to accuse him of. Lowe does not intend to present us with a coherent version

of Genuine Change. He merely wants to present the ‘germ of truth’ in McTaggart’s argument in a coherent way. The lesson to learn from Lowe is that, once we have rendered McTaggart’s assumptions about temporal passage coherent, it is plain to see that they do not amount to temporal passage, as Le Poidevin shows very clearly with his analogy. In any case, Lowe’s objection shows that neither ‘meta-language’ reconstructions nor disjunctive formulations of McTaggart’s argument can save the notion of Genuine Change as temporal passage.

In the last sections I have presented four frequently found objections to McTaggart’s argument. All of them, as I have purported to show, fail. Some of them concentrated on the idea that McTaggart’s paradox is committed to events that change, while holding that events cannot change or do not exist at all. I have pointed out that according to McTaggart, Genuine Change is a unique kind of change, precisely because events can undergo it. I have also shown that McTaggart’s argument does not rely on the existence of events. Other objections argue that there is no initial contradiction in McTaggart’s premises because they are either ambiguous or ill-formed. However, alternative understandings either fail to remove the contradiction or fail to express temporal passage. I conclude that so far all objections have been unsuccessful.

All the objections in this chapter were either concerned to defend Genuine Change or attack a straw man in the aim to refute McTaggart’s paradox. In the next chapter I shall introduce and defend another kind of objection, which is based on the rejection of Genuine Change as passage.

I will argue that the only coherent way to describe passage is as *coming to be and ceasing to be* of times.

Chapter Five Absolute Becoming

In the last chapter I have defended McTaggart’s paradox against objections that either accept the assumption that temporal passage is Genuine Change, and then try to render it coherent, or that focus on the wrong problem with the paradox, like McTaggart’s event ontology. In this chapter I shall argue that the only way to refute McTaggart’s conclusion about the impossibility of temporal passage, is to reject his assumption that passage is Genuine Change. The aim of this chapter is to show that there is an alternative way to understand temporal passage, which is not susceptible to the paradox argument. Briefly put, the view understands passage as coming into, and, on some views, going out of existence of times. I shall call this change with Broad (1923) ‘absolute becoming’.

In the first section of this chapter I will introduce the notion of absolute becoming and explain its relation to other types of change, such as qualitative and substantial change. The second section shows how absolute becoming avoids McTaggart’s paradox and replies to an objection. In the third section I shall argue that absolute becoming is not compatible with eternalism, the view that all times exist. The last two sections examine whether and how the two major non-eternalist dynamic theories, presentism and the growing block theory, can coherently explain temporal passage. In the fourth section I argue that presentism supports a coherent notion of passage. I shall reply to an objection concerning presentism and passage, and suggest a presentist formulation of passage. In the last section I shall argue that whether the growing block theory can escape the paradox depends on certain stipulations we make about the time-series.

This chapter terminates the first part of this thesis. The second part focuses on the question whether we can have experiences of temporal passage. Chapter six begins by introducing the so-called ‘Argument from Experience’.

5.1 A different kind of passage

The trouble with McTaggart's paradox is rooted in the assumption that terms change with regards to their A-properties, which is to say the problem is based on the thought that passage is some

form of *qualitative change*, a change that I have called Genuine Change. I understand qualitative change very broadly as change in the intrinsic or relational properties of some thing, and as opposed to *quantitative change*, which is a change in the number of some thing(s) rather than in its properties. If passage is not Genuine Change, then what is it? It seems intuitively plausible that passage is some kind of change. I propose that temporal passage can only be coherently construed as *change in what exists*. In the next paragraphs I shall determine what I mean by that.

Consider once again McTaggart's favoured theory of time, the eternalist A-theory or 'moving spotlight'-theory. It holds that there is a static series of times and events along which the present 'moves', 'somewhat like the spot of light from a policeman's bull's-eye traversing the fronts of the houses in a street', as Broad picturesquely put it (Broad 1923, p.59). Most contemporary 'spotlighters' consider the present to be special in the sense that what is present is somehow ontologically privileged (cf. Williamson 2000; Smith 1993). Some A-theories push this thought further by linking presentness to existence. Many presentists for example, think that to be present just is to exist (see for example (Tallant 2010)). For them, passage is constituted by times coming into and going out of existence. For others, like Broad (Broad 1923; 1938) or Tooley (2000), passage is constituted by times coming successively into existence but without ceasing to exist as they become past. These 'growing blockers' argue that only what is past and present exists and conceive of temporal passage as a constant increase of the 'sum total of what exists' (Broad 1923, p.67) as ever new present times come into existence. Growing block theories defend a 'mixed' theory of passage: times come into existence as they become present but they undergo qualitative change (Genuine Change) as they become past. Theories that support a view of passage that involves times coming into existence, can be summarised under the label *creationist theories* (cf. Zeilicovici 1981, p.512).

I shall call the change that occurs when times come into being (and, on presentism, also cease to be) *absolute becoming*.¹ The expression stems originally from Broad (1923, p.67) but note

¹ Remember that 'a time' includes all events, objects, facts etc located at a single temporal location. Thus when a time comes into or goes out of existence, so do all other terms located at it.

that Broad only refers to coming into existence, whereas I shall use it to refer to either only coming to be, or both, coming to be and ceasing to be. Absolute becoming is not qualitative change, because for something to change qualitatively, it needs to be some way at one time, and in a different way at a later time. Differently put, when some thing changes qualitatively, it makes always sense to ask: in what way is it different from before? When some thing comes into existence though, this question is unintelligible. For some thing that comes into being was not different before- it was not at all. As Broad puts it

Moreover, we can see that [absolute] becoming is of so peculiar character, that it is misleading to call it change. When we say that a thing changes in quality, or that an event changes in pastness, we are talking of entities that exist both before and after the moment at which the change takes place. But when an event becomes, it comes into existence, and it was not anything at all until it had become. (1923, p.68)

Analogously, it makes no sense to ask of a thing that has ceased to exist 'in what way is it different from before?' So, what kind of change is absolute becoming then? I propose that it is best termed as *ontological change*, that is to say, as change in what there is.

Of all theories that involve absolute becoming only presentism conceives of temporal passage solely in terms of absolute becoming. In contrast with that, the growing block theory has mixed notions of passage that involve absolute becoming *and* Genuine Change. In what follows, I shall concentrate on the three major A-theories, A-eternalism, presentism and the growing block theory. I shall argue that presentism avoids McTaggart's paradox, while the answer to the question whether or not the growing block theory avoids it, might depend on other philosophical commitments. A-eternalism, or the moving spotlight theory, is susceptible to McTaggart's argument.

In the remaining paragraphs of this section I shall argue that, if there is absolute becoming, then it must be more fundamental than other kinds of change because all other kinds of change depend on it. First I will say something more about the relation between absolute becoming and qualitative change, before proceeding in 5.1.2 to the relation between absolute becoming and substantial change.

5.1.1 Absolute becoming and qualitative change

Consider the following:

(C) The apple was green and is now red.

All theories of time agree that the sentence describes a qualitative change, but they have different opinions as to what (C) means. For B-theorists, (C) means

(C_B) There is a time at which the apple is green and a later time at which the apple is red.

For A-eternalists, (C) means

(C_{A/E}) There is a past time at which the apple is green and a present time at which the apple is red.

A-eternalists and B-theorists both think that (C) implicitly quantifies over two different times. They differ in the question whether (C) is irreducibly tensed, or differently put, they differ in the question whether or not there are tensed facts in reality. In contrast, presentists agree with A-eternalists about the irreducibility of tense, but they do not quantify over more than one time.

For a presentist, (C) means

(C_{PRESENT}) The time at which the apple is green has ceased to exist and another time, at which the apple is red, has come into existence.²

Or, more precisely:

There is exactly one time and at that time the apple is red and it was the case that there is exactly one time, different from the time that exists now, and at that time the apple was green.

² The presentist should take the copula 'is' in 'the apple *is* green' and 'the apple *is* red' to be tenseless in the 'neutral copula sense', because the present tense is already expressed by the fact that the red apple exists, and the past tense by the fact that the apple being green does not exist anymore.

That is to say, for presentists, the apple's change from green to red depends on the ceasing of one time and the coming into existence of another. 'Growing blockers' understand (C) as

(C_{GB}) There is a past time when the apple is green and a present time when the apple is red and the time that is the present time did not exist before and there is no time later than it.³

For presentism and the growing block theory, qualitative changes depend on the coming to be of a novel present time. On both theories the apple that is green only becomes red when another time comes into existence, a time at which the apple is red. Thus creationist theories, like presentism and the growing block theory, hold that qualitative change only occurs if absolute becoming occurs. Broad puts the point from a 'growing blocker' perspective in the following way:

But, when we say that the red section precedes the green section, we mean that there was a moment when the sum total of existence included the red event and did not include the green one, and that there was another moment at which the sum total of existence included all that was included in the first moment and also the green event. Thus a complete analysis of the qualitative changes of things is found to involve the coming into existence of events. (Broad 1923, p.67)

I would put it even stronger than Broad: not only does qualitative change *involve* absolute becoming, but, according to presentism and the growing block theory, there *could not be* any qualitative change without absolute becoming. The opposite, on the other hand, is at least conceivable: it is conceivable that there could be absolute becoming without any qualitative change. In other words, there could be a time that comes into being which is qualitatively identical to the previous time, which is just the intuition that there could be time without change.⁴ It follows that absolute becoming is more fundamental than qualitative change and that all qualitative change must depend on it (in the sense that qualitative changes only occur if absolute becomings occur).

³ The growing block theory also exists in tenseless formulations (cf. Tooley 2000). It would then read 'there is a time when the apple is green and a later time when the apple is red and there is no time later than that time.'

⁴ Creationists do not have to claim this, but my point is just to point out that absolute becoming is a more fundamental change than qualitative change. This is made even more clear by the fact that, on creationist views, it is conceivable for absolute becoming to occur without qualitative change, but not conceivable for qualitative change to occur without absolute becoming.

I shall now turn to the relation between absolute becoming and substantial change.

5.1.2 Absolute becoming and substantial change

In his paper ‘How Real Is Substantial Change?’, Lowe mentions four different kinds of change: *qualitative change, relational change, compositional change and substantial change* (2006). Qualitative change, he says, is the change that an object undergoes with respect to its properties, relational change is change of an object with respect to some relation that it instantiates with one or more other objects, and compositional change is a change that some object undergoes by virtue of one or more of its proper parts changing. Finally, there is what Lowe calls with Aristotle ‘substantial change’:

Finally, a substantial change occurs when an individual substance either comes into or goes out of existence, that is, when it is either created or destroyed: for example when a living creature dies. (Lowe 2006, p.275)

Absolute becoming, I shall argue, is a form of substantial change. It does not involve any change with respect to intrinsic or relational properties, thus it cannot be qualitative change (where I understand relational change as a qualitative change with respect to relational properties). Absolute becoming cannot be compositional change either- if time passes, then the change that constitutes passage must concern every individual term of the series, whereas compositional change only concerns complex extended entities. Substantial change occurs when things come into and go out of existence, thus absolute becoming must be some kind of substantial change. That said, there are several ways to understand substantial change, not all of which are compatible with the idea of absolute becoming. My first task shall therefore be to identify the different understandings of substantial change and then see which ones are and which aren’t compatible with absolute becoming.

First of all we have to exclude a ‘reductive’ approach to substantial change, according to which substantial change is just qualitative change with regards to the property of existence. Absolute becoming cannot be substantial change in that sense, because if it was, then we would have not gained any ground with regards to McTaggart’s paradox. For suppose that passage was constituted by terms changing with regards to the property of existence, then

(1) Term T changes from instantiating the property of existence to not instantiating the property of existence.⁵

Given that T undergoes some qualitative change, (1) implies (2):

(2) T exists and T does not exist.

(2) is clearly contradictory, so we have to qualify it to different times:

(3) T exists at a time t_1 and T does not exist at a time t_2 .

t_1 and t_2 are also subject to absolute becoming, and so we must say that both exist and don’t exist. This is a contradiction, and so we have to qualify to times: t_1 exists at u but not at v (and similarly for t_2). But u and v are subject to absolute becoming, and so both exist and don’t exist. This is a further contradiction, unless we qualify to further times and so on. If absolute becoming was just qualitative change with regards to the property of existence, the paradox could not be avoided. It is thus important to exclude any such reductive reading of absolute becoming.

The question whether or not existence is a property has been long discussed in philosophy. One prominent argument against the view that existence is a property is that a thing is ontologically prior to the properties it instantiates — in order to instantiate any property, a thing must exist in the first place (Craig 1997, p.45). Thus, if existence was a property, then it could not be instantiated, unless the object already existed. To go further into that debate would lead me too far astray from the topic at hand.⁶ What is clear is that there have been a number of good arguments for the view that existence is not a property and that dynamic theorists would have to accept them in order to escape McTaggart’s paradox. As I want to assess the strongest version of a dynamic theory I will henceforth assume that existence is not a property.

⁵ Let us ignore for the moment the disturbing fact that a reductive approach would require us to endorse non-existent entities.

⁶ For further discussion of the question whether existence is a property see for example McGinn (McGinn 2000, chpt.2), Inwagen (Inwagen 1998), Lowe (Lowe 2006) and Craig (Craig 1997).

There is a second understanding of substantial change which is not compatible with the notion of absolute becoming. One might for example say that a table undergoes substantial change when it is chopped to pieces, because the table has then ceased to exist. But somebody might object that the table does not ‘really’ cease to exist, since its constitutive parts do not cease to exist- they merely undergo relational change. Thus the view is that

(...) all that ever “really” occurs is that qualitatively invariant atoms undergo changes in their external relations to one another-(...). In short: all changes are mere *rearrangements of ‘atoms’* in the void-(...). (Lowe 2006, p.279)

Note that Lowe speaks about philosophical atoms, not atoms as referred to by scientists, where philosophical atoms are just indivisible objects without proper parts (also sometimes called *simples*). Obviously this is not the kind of substantial change that absolute becoming should be identified with. If substantial change is taken to be merely a ‘rearrangement of simples’, then it is once again just reduced to some qualitative change. As I have tried to show though (cf. chapter 3.3.3.), it is the understanding of passage in terms of qualitative change that leads into McTaggart’s paradox.

There is a stronger notion of substantial change which cannot be reduced to qualitative change. On this view, when a table ceases to exist, all its constituent parts, down to the smallest indivisible atoms, cease to exist. Neither the table nor any of its parts are still part of reality when it has ceased to exist in that strong sense. Absolute becoming, I argue, should be understood as this ‘strong substantial change’, so as involving more than just a ‘rearrangement of simples’. To fully understand what that means though, we have to first clarify what it means to say that x comes into or goes out of existence.

According to some views, for x to have come into existence at some time t, is just for x not to be located at any time prior to t. Analogously, for x to have gone out of existence at some time t, is just for x to be located at a time prior to t and not simultaneous with t or at any time thereafter. On this view, Caesar’s going out of existence 44BC for example is just his failing to have a location after that date (cf. Lowe 2006, p.284). Contrast this with a view according to which Caesar’s going out of existence means that Caesar is no longer real in the sense that he is

no longer part of reality. The difference between these views is based on a difference between ‘existence at a time’ and what one might call ‘existence simpliciter’. If some x does not exist simpliciter, it does not exist, in the very same sense as Sherlock Holmes or unicorns do not exist: *it is not real*. On the other hand, if some x does not exist in the ‘existence at a time’ sense, then this just means that x does not exist *at a certain time*. Philosophers that defend the latter idea of existence, think that *all* (non-fictional concrete) objects, independent of their temporal location, exist simpliciter. In their view, Caesar exists, just not in our time. The view sounds less alien if one considers the analogy to space: Mars does not exist here, but surely nobody would disagree that it exists *simpliciter*. In Lowe’s words, the ‘existence-at a time’ view is the view that the

(...) lack of present location (...) is the only reason why it is that however closely you explore the physical universe now, you will not encounter Caesar, despite the fact that he does exist simpliciter. For [the holder of this view] will contend that it is still true to affirm, *timelessly speaking*, that Caesar is one of the things that exist. (Lowe 2006, p.284)

If coming into existence and ceasing to exist was merely a question of temporal location, then we could not define temporal passage in terms of it, for terms cannot change their temporal location (cf. chapter 1.2 and 2). The only change they can undergo is either a change in Λ -properties (cf. chapter 2.2, 2.3), which we have found to be incoherent (cf. chapter 3.3, 3.4), or becoming part of reality and ceasing to be part of reality — but this is different from not being located before or after ones actual temporal location. Thus strong substantial change is coming into existence and going out of existence in the sense of ‘becoming part of reality’ or ‘ceasing to be part of reality’ (cf. Lowe 2006), or briefly put, ‘becoming real’ and ceasing to be real’. We can summarize that absolute becoming, the change that constitutes temporal passage, should be understood as strong substantial change that times undergo when they come into existence simpliciter and cease to exist simpliciter, where coming into existence simpliciter and ceasing to exist simpliciter should be understood in terms of becoming real and ceasing to be real. In short,

absolute becoming occurs when times become real, or become real and cease to be real.

I suggest that the only coherent way to understand temporal passage is in terms of absolute becoming. In the next section, I will explain how absolute becoming avoids the paradox. I will also consider and reject an objection to that view.

5.2 Absolute becoming and McTaggart's paradox

McTaggart's paradox gets off the ground as soon as we treat passage as qualitative change that instantaneous terms undergo with regards to their A-properties. To avoid the contradiction inherent in this change, we are forced to launch an infinite vicious regress. The same problem however cannot occur when we understand passage as absolute becoming, because coming into existence does not involve the instantiation of incompatible properties. Therefore there is no initial contradiction to be avoided, and thus no danger to plunge into the regress. Differently put, McTaggart's paradox is based on the idea that passage is a change of times that itself takes time. Absolute becoming does not match this description because it is supposed to be a change *of* time and not *in* time, by which I mean that absolute becoming is a change that does not itself take time.⁷

Some philosophers have doubted whether absolute becoming can avoid McTaggart's challenge on these grounds. The basic form of the objection is this: every change occurs in time, that is just how change is defined. If absolute becoming is supposed to be a change *of* time, then that change must occur *in* some higher order time, or 'super-time'. If this is the case, then nothing is gained by bringing in absolute becoming. For consider a time coming into existence. This event of absolute becoming would itself occur *at* a super-time, but as all times undergo absolute becoming, every time-series would require a higher-order time-series in which the absolute becomings of its new times occur. Rea, referring to Aristotle, claims that all substantial change must be change that occurs in time, for every substantial change involves some qualitative change that occurs in time:

When a horse comes into existence, some matter changes from being arranged non-horse-wise at one time to being arranged horse-wise at some other time. Similarly for other case of substantial generation. So why think that matters could be any different for times and events? (Rea 2003, p.258)

⁷ For a discussion of the difference between change in time and change of time see for example Zeilicovici (cf. Zeilicovici 1981).

It is clear from the quote that Rea's criticism makes use of the ambiguity inherent in the notion of substantial change. Earlier on, I have distinguished between weak substantial change in the sense of 'rearrangement of particles', and strong substantial change, in the sense of becoming part of reality or ceasing to be part of reality. In the case of strong substantial change, the coming into existence of the horse is *not* just a rearrangement of matter, because strong substantial change involves matter itself coming into existence. If some x comes into existence in the strong substantial change sense, then neither x nor any part of x was constitutive of reality at all. If x was not real before now, then it is not true to say that parts of x were such-and such at an earlier time and are different now. In other words, absolute becoming is not a change that can be analysed as the having of incompatible properties *at different times*, it does not itself *take* time. Absolute becoming, as I said before, should be understood as strong substantial change. Judging from the foregoing quote, it seems as though Rea does not even consider this view of absolute becoming, although he is aware of the fact that Broad's notion of absolute becoming does involve a stronger sense of substantial change. Nevertheless, he dismisses that notion as simply 'unintelligible' and 'impossible to understand':

Given my own acquaintance with familiar cases of generation, I find it absolutely impossible to understand the view that times are generated without being generated *at a time* in some higher-order second times. (Rea 2003, p.259)

He admits however, that his position basically comes down to the intuition that tensed facts about change (as in 'the apple is (now) red and was green') must be reducible to facts about a subject having incompatible properties at different times (as in 'the apple is green at t_1 and red at t_2 ') — which is just the intuition that creationist theories are wrong. For the creationist, the point is precisely that absolute becoming is not reducible to the instantiation of properties at different times, therefore for her, the question when absolute becoming occurs is unintelligible.

Another way to put it is this. When a time ceases to exist, and another time comes into existence, time does not change, it is *replaced*. Zeilicovici (1981) has argued that such replacements are not changes in time (but of time) because they lack a subject of change.⁸ The

⁸ Zeilicovici makes the point in defence of the growing block theory. However, his argument is stronger with regards to presentism, because it is intuitively obvious that times replace each other on the presentist view, while it is

subject of change cannot be the time that ceases to exist because to be a subject of change, the time would need to exhibit a difference before and after the change. This is not possible because the time that ceases to be does not exist anymore after the replacement. Analogously for the time that comes into existence: it does not exist before the replacement and thus cannot be different after the replacement occurred.

The point is that replacements cannot be changes in time, for they lack a subject of change that survives the change. That said, not every replacement lacks a subject of change. Consider a magician who transforms a translucent sphere into a black bird. One could say that the sphere changes into a bird, but a more accurate description would surely be to say that the sphere is *replaced* by the bird because the bird shares none of its properties with the sphere (apart from being a spatio-temporal solid object); nothing of the sphere remains when the bird appears in its place. The two things have not changed, for in order to change, the subject of change needs to survive (cf. chapter 3.2). However, *something* has changed when the sphere is transformed into a bird. The magician's table for example changes from being such that it carries a translucent sphere, to being such that a black bird is sitting on it. Compare this with the case where the present time is replaced. If the present time is being replaced, then it is difficult to come up with any object that changes because, different from the magician case, there is 'nothing left' that could change. Differently put, there is nothing analogous to the table which could change when time is replaced. Only things in time can change and when time itself ceases to be, then the things located in it, go with it. Zeilicovici's argument makes sense- a replacement of time lacks a subject of change and it is therefore plausible to say that absolute becoming is a change of time, not in time.

I shall now say a bit more about the incompatibility of eternalism and absolute becoming, before I will analyse whether and how absolute becoming helps to avoid McTaggart's paradox in the light of presentism and the growing block theory.

5.3 Absolute becoming and eternalism

not so clear whether this is the case given the growing block theory. I will come back to the growing block argument in section 5.5.

Eternalist theories hold that all times exist, so all terms are part of reality, independent of their temporal location. For the eternalist, all objects exist simpliciter and she takes this to be a timeless fact (which is to say a fact that always exists). Given that for the eternalist everything that exists in time exists simpliciter, she cannot make sense of 'coming into existence simpliciter' or 'going out of existence simpliciter'. For her, all things that are in time are part of reality- they always exist at the time they are located. Caesar, dinosaurs and the first man on Mars all exist- at their own time. On the other hand, non-eternalist theories, like presentism and the growing block theory, do not share this view. For them, only the present, or respectively the present and the past, exist simpliciter. Differently put, for non-eternalists, reality is only constituted by the present, or the present and the past. For presentists, temporal passage is a constant change of what constitutes reality simpliciter as times come into being and cease to be. Similarly for growing block theorists, where temporal passage is a constant increase of what constitutes reality simpliciter as more and more times come into existence and remain part of reality from then on. Thus, only non-eternalist theories have room for a notion of passage that involves absolute becoming, which is to say that only non-eternalist theories can be creationist theories. In the last section I have argued that temporal passage construed as absolute becoming is immune to McTaggart's argument. McTaggart's mistake is not intrinsic to his argument; rather it consists in not ever considering an alternative view of time and passage.

To see how absolute becoming exactly avoids the paradox, it is necessary to go through the different creationist views in more detail. We shall see that presentism can avoid the paradox best, whereas the case is not quite as clear with the growing block theory.

5.4 Absolute becoming and presentism

Presentism is, briefly put, the thesis that it is always the case that only the present exists, where 'the present' refers to the present time and everything that constitutes it (events, facts, objects). If presentism is true, then nothing exists at a temporal distance from any other thing. Presentism can be understood in different ways, so I shall say a few things as to how I understand it.

Firstly, as I have defined 'a time', 'the present time' is neutral between a substantialist understanding according to which times are abstract entities at which objects, events, facts and so forth are located, and a relationist understanding where times are sets of simultaneous events,

or according to which times are sets of propositions (see chapter 1.2).⁹ I have argued that it does not make a difference to McTaggart's argument whether we think of times in a substantialist or relationist way (chapter 3.3, 4.1) — what is important is that all eternalist A-theories are threatened by it. Consequently it does not matter for my argument whether we understand presentism in a substantialist or in a relationist way — both views avoid the McTaggartian paradox.

Secondly, if presentism is true, then it is *always* true (true at all times) rather than at one time as opposed to another. For it is incoherent to think that the Roman Empire does not exist today, but that it exists tomorrow (in the past). Some presentists (cf. Markosian 2010) also think that presentism is *necessarily* true. However, there is nothing in the doctrine of presentism itself that gives reason to think that it should be necessarily true (cf. Crisp 2005).

Thirdly, presentism requires the notion of existence *simpliciter*. To see why, consider an objection against presentism according to which it is fundamentally flawed because it cannot be expressed in a non-trivial and coherent way.¹⁰ Consider the presentist statement

(1) It is always true that only the present exists.

The accusation is that the word 'exists' can be read in a tensed or in a tenseless way. If read it tensed, we get

(2) It is always true that only the present exists now.

Nobody disagrees with (2) because it is trivially true. In B-theoretic terms, (2) becomes 'it is always true that only what is simultaneous with this utterance exists simultaneous with this utterance' — clearly a tautological truth. However if we read 'exists' in a tenseless way, we get

(3) It is always true that only the present exists at a time *t*.

⁹ For a view of times as sets of propositions see for example (Crisp 2005).

¹⁰ For more discussion on this issue see for example (Crisp 2005), (Lombard 1999), (Sider 1999), (Zimmerman 2005), (Torrengo forthcoming).

Note that there are two kinds of tenseless notions: those that explicitly refer to a time as in (3), and those that do not refer to any time at all (cf. Torrengo forthcoming, p.4). Following Torrengo (forthcoming), I will call the former *pseudo-tensed* notions and the latter *simple* notions (forthcoming, p.4). Pseudo-tensed notions as expressed by (3) are tenseless in that there is no implicit temporal reference to a time (the present), but only explicit reference to a temporal location.¹¹ (I shall come to simple notions in due course).

Thus understood, (3) is clearly false. It is not true that 1986 is always present, say. Another interpretation of (1) could be (4):

(4) It is always true that only the present did exist, exists and will exist.

If (4) does not involve a change of what exists simpliciter, then it can only be understood as implicitly quantifying over three differently tensed times, as in

It is always true that the present time exists at some past time, exists at some present time and exists at some future time.

Spelled out in this way, (4) just looks incoherent. The objector claims we have now exhausted all possible readings of (1). Therefore, according to this objection, whether we understood (1) tensed or tenselessly, presentism is either trivial or false.

However, if we adopt the notion of existence simpliciter, then the dilemma can be avoided (cf. Torrengo forthcoming). A presentist should thus reject the readings (2), (3), and (4), for in each of these interpretations existence is qualified to some time or other. Instead, presentists should understand (1) as

¹¹ It is important to see that pseudo-tensed notions are in fact tenseless notions, although the terminology in the literature is sometimes confusing. As Torrengo explains,

'Temporal qualifications of this kind, that is, relational qualifications to times or temporal indexing (e.g. *being-red-at-t*) are usually, and rightly, classified as tenseless (Hawley 2001). However, when the explicit temporal modification concerns the copula (*being-at-t*), philosophers usually talk of 'tensing the copula' (Lewis 2002). The slippery talk of pseudo-tense as a tensed notion may be harmless in certain contexts (for instance if the focus is one the temporal modification and not on the implicit reference to the present), but here it is crucial to see that pseudo-tense is a tenseless notion.' (Torrengo forthcoming, p.4, footnote2)

(5)

'It is always true that only the present exists simpliciter', which in turn means

'It is always true that only the present *is real*'.

(5) is coherent and incompatible with an eternalist (tensed or tenseless) reading, because for eternalists whatever is real, is real independent from when it exists, whereas (5) restricts what is real to the present.

This shows that presentism is already committed to the notion of existence simpliciter, even without any mentioning of temporal passage. From here it is easy to argue that presentism is also committed to the notion of absolute becoming: All versions of presentism have in common that what is present changes. If only the present time is real, and what is present changes, then presentism must imply that reality changes. Reality can only change if terms undergo absolute becoming. It follows that presentism, as I understand it, implies absolute becoming. For the presentist, temporal passage is constituted by absolute becoming: the becoming real and ceasing to be real of times.¹²

Presentism avoids McTaggart's paradox. To see how, it will be instructive to turn once again to the general problem of change. Remember that the problem was supposed to be that, in order to change, an object has to instantiate incompatible properties while it exists, which is *prima facie* contradictory, because it implies $F(a)$ and not $\neg F(a)$. On a presentist ontology the problem of change cannot arise, because objects only exist at one time- the present time- and only have present tensed, compatible properties. Thus, the presentist has no problem with intrinsic change: the apple *was* green, but now it *is* red. There is no contradiction because, for the presentist, there are only present things and the (past) green apple is not in our 'most inclusive domain of qualification' (cf. Crisp 2007). Similarly, the presentist can avoid the initial contradiction in McTaggart's paradox by denying that there is something that instantiates the properties 'being

¹² For some versions of presentism, the claim that passage consists of times coming into and going out of existence simpliciter needs to be qualified. According to so-called 'ersatz-presentism' as defended for example by Crisp (2005) and Bourne (2006b), times are sets of propositions that always exist by virtue of being abstract entities. On that view, passage consists in times changing their truth-value. On the ersatz account only the present time is true, whereas past times were true and future times will be true. Although not explicitly mentioned, I think that the ersatz account is committed to truth-makers that undergo absolute becoming, for if the account would assume a deflationist theory of truth (which denies the need for truth-makers), then temporal passage would be utterly inexplicable.

past' or 'being future'. Instead, 'E is past' means that E has gone out of existence, whereas 'E is future' means that E does not yet exist. Assuming that existence (and thus 'being real') is not a property (cf. 5.1.2) and that absolute becoming is a change of time not in time (cf. 5.2), we have avoided the paradox because the problem of change does not even arise. Before I have argued that what makes the idea that absolute becoming is a change of rather than in time plausible, is the case where absolute becoming involves a replacement of the time-series. Note that the presentist notion of passage goes naturally together with the view that passage involves a replacement of the time-series. According to presentism, the time-series only ever consists of one time — the present time. When the present ceases to exist and the next time comes into being, the time-series (constituted by one time) is being replaced by another time-series (constituted by a different time). On the growing block theory this is not so obvious, which is why it cannot avoid the McTaggart's paradox quite as elegantly as presentism can. Before I will explain all this in more detail, I shall consider an objection against the view that presentism can coherently accommodate passage.

In 'Modality and Tense', Fine (Fine 2005, p.286 pp.) argues that the presentist (or, in his terms, the 'standard realist') has trouble in accounting for temporal passage:

Now it is very difficult to say what [temporal passage] is. But a thought commonly had by realists is that it essentially consists in the successive possession of the property of being PRESENT or NOW, for time to pass from one moment to the next is for a property of presentness to pass from one moment to the next. (...) But although the [presentist] can grant that there is such a property, his metaphysics makes it entirely unsuited to accounting for the passage of time. For what can he say about the present that might bear upon this question? He can maintain that something is present, not merely in the sense in which the [tenseless theorist] might concede, but also in the sense in which this fact, or facts from which it follows, are themselves constitutive of reality. (...) However this will not serve his purpose; for the passage of time requires that the moment of time be successively present and this appears to require more than the presentness of a single moment of time. (2005, p.286)

So according to Fine, the presentist holds that passage consists in times successively possessing the property of presentness. Presentism, he argues, fails to express temporal passage, because it

cannot articulate the succession of presentness. All it ever describes, so the argument, is a ‘static block with a privileged centre’.

I think that Fine’s worry can be appeased, if we refer to the distinction between what Fine calls ‘ontic presentism’ versus ‘factive presentism’. According to Fine, ontic presentism is an ontological position about what there is, whereas factive presentism is a metaphysical position about how things are (cf. Fine 2005, p.99). I hold that a presentist who wants to express the passage of time in a meaningful and coherent way, needs to be an ontic presentist for whom passage is constituted by a change in what is real. First of all, note that while presentism is indeed compatible with the existence of a presentness property (the rejection of pastness and futurity properties does not entail the rejection of a presentness property), it is not committed to a such a property. In fact, most presentists would probably reject the notion of a presentness property. If we follow Craig (1997, p.40) in understanding presentness as a certain ‘mode of existence’, namely as ‘temporal existence’ as opposed to timeless existence of abstract entities, then a change of what is present entails a change in what there is. Factive presentism cannot accommodate a change in what is there is, because factive presentism merely determines *how* things are — it singles out a time that is special by virtue of being present, but it does not exclude anything from being. In other words, factive presentism seems to be much closer to what I have called Λ -eternalism than to presentism as I understand it. Ontic presentism on the other hand is a thesis about what there is. Bearing this in mind, we can now come to the crux of the matter. Fine claims that presentism cannot express the idea that times are successively present. He argues that

[the presentist can only appeal to] the fact that any particular future time t^+ will be present and that any particular time t was present. However, the future presentness of t^+ this amounts to no more than t being present and t^+ being later than t , and, similarly, the past presentness of t amounts to no more than t being present and t^- being earlier than t .’ (2005, p.287)

For the ontic presentist however, the fact that

(P) t^* will be present and t' was present’

does amount to *more* than just times being earlier and later than the present. In fact, strictly speaking, for the ontic presentist (P) cannot express any relation between the present and other times— simply because for her t^* and t' do not exist and relations, as it is standardly hold, entail the existence of their relata. Instead she understands (P) in the following way:

(P*) t^* will be real and t' was real.

Instead of a block with a privileged centre, her analysis of passage amounts to a change of reality as different times come to be and cease to be. Or to put it in Lowe’s words,

Reality *itself* changes in respect of its content as time passes—indeed it is precisely in this that the passage of time ultimately consists, in my view. (2006, p.285)

To sum up the point, Fine’s criticism only targets factive presentism, which is a position much more akin to Λ -eternalism than to presentism as I understand it. From his criticism we can learn that if one wants to be a presentist, then one should better be an ontic presentist.

There is nevertheless still an issue about the correct *formulation* of ontic presentism and passage. As Fine correctly points out, the fact that time passes should be a tenseless fact rather than a fact that holds at one time and not at another. A tenseless formulation though, he argues, cannot sufficiently distinguish the presentist’s view from a tenseless view. To demonstrate this, Fine considers the following formulation:

(KF) It is always the case that some time is present, that all earlier times were present, and all later times will be present.

Whether (KF) can be sufficiently distinguished from a tenseless view, depends on the interpretation of ‘present’. If to be present is to instantiate a presentness property, then Fine is right: (KF) succeeds in singling out one moment as the present moment, not in describing passage. As a consequence, there is a reading of (KF) which is perfectly compatible with the tenseless view:

(KF_{Tt}) It is always the case that some time is simultaneous with this utterance, that all times earlier than this utterance are simultaneous to some time before this utterance, and all times later than this utterance are simultaneous to some time after this utterance.

If presentness is supposed to be a property, then (KF) can be accepted by all sides, for the B-theorist can single out a time that is present with a token reflexive or date analysis of what it is to be present, and then agree that all earlier times are present before that time, and all later times are present after that time. If, however, presentness is understood as a mode of existence, then the presentist can make a point that no B-theorist can accept: namely that presentness is an objective, mind-independent matter, that only the present time is constitutive of reality and that which time is present changes, independent of any perspective.

The challenge for presentism is thus to find a formulation that ties presentism to a change of what exists simpliciter, that is to say, to a change of what is real. I propose the following formulation of presentism:

- (1) It is always the case that [there is exactly one time, it was never the case that it is real and it will never be the case that it is real]
- (2) It is always the case that [it will be the case that a time is real and it was the case that a time is real]
- (3) It is always the case that [a time is present if and only if it is real].

(1) is incompatible with the tenseless interpretation of (KF), because it picks out a certain time that is real, whereas according to the B-theory, all times are real. (1) is not sufficient though, because it is compatible with a world that is forever stuck in a single moment of time. (2) makes sure that there is more to reality than just one moment- there have been other times and will be other times. (3) ties existence to presentness rather than pastness or futurity. Therefore (1), (2) and (3) ensure that temporal passage consists in different present moments coming into and going out of existence simpliciter. (1), (2) and (3) together formulate presentism in a way that meets Fine's challenge. My definition of presentism describes passage as change of what exists. The notion of passage expressed in this way, I claim, is incompatible with the tenseless view of time.

The last section of this chapter focuses on absolute becoming and the growing block theory. I shall argue that the growing block theory might be able to avoid McTaggart's paradox as well, although the case is not as clear as it is with presentism.

5.5 Absolute becoming and the growing block theory

Growing block theories¹³ essentially hold that the sum total of what exists increases as time passes and things become present. For the growing block theory, becoming present is to become real. Becoming past on the other hand does not involve any change in what is real- times that are present remain real forever, they only undergo qualitative change as they become more and more past. In other words, the growing block theory is a mixed theory that involves both, Genuine Change and absolute becoming. As we have seen, McTaggart's paradox is based on the idea that passage consists in Genuine Change. Terms in the growing block picture still undergo Genuine Change- the only difference to the A-eternalist theory is that they undergo Genuine Change only with regards to two A-properties, pastness and presentness, rather than three- pastness, presentness and future.¹⁴ At first glance, this feature appears to make the growing block theory still vulnerable to McTaggart's argument. McTaggart himself remarks as much in his reply to Broad:

[T]ime would still, on Dr. Broad's theory, involve the contradiction described above (...). For although, if Dr. Broad were right, no moment would have the three incompatible characteristics of past present and future, yet each of them [...] would have the two incompatible characteristics of past and present. And this would be sufficient to produce the contradiction. (McTaggart 1927, p.26)

Mundle makes the same point:

If Broad was, at this period, persuaded by McTaggart's arguments to regard 'every event is past, present and future' as involving a contradiction, he should have seen that the alleged

¹³ Defenders of the growing block theory include Broad (1923), Zeilicovici (1981) and Tooley (1999).

¹⁴ Tooley's growing block theory (1999, 2000) rejects all A-properties- the present time is defined as the last time on the boundary of existence, or differently put, as the only time that is not succeeded by another time. To be past then is to have a succeeding time. This difference to Broad's growing block view does not make a difference to my argument though.

contradiction would not be removed by his new theory; for although the latter implies that futurity is not a characteristic for any event, the alleged contradiction would still arise concerning pastness and presentness. (Mundle 1954, p. 360)

There is a point to what McTaggart and Mundle say here. The fact that terms are supposed to qualitatively change from present to past initiates the same problem that we find in McTaggart's eternalist set-up. If terms are to change from being present to being past, then this requires them to be present and past. To avoid this contradiction, we need to qualify a term's being present and its being past to different times, but these times also change from present to past, which has to be qualified to different times and so forth- the regress is launched. In chapter three I argued that what makes McTaggart's regress *vicious*, is the fact that passage is constituted by a chain of Genuine Changes which are merely relational changes and as such require a non-relational change to bring them about- but that no such change is to be found. An analogous argument can be made for the growing block view. Becoming (more) past must be, on pain of contradiction, a relational change that occurs in virtue of some other change. Ultimately, it requires a non-relational change to bring it about. Different from the A-eternalist spotlighter view though, there *is* a non-relational change that can bring the relational changes about. That non-relational change is the absolute becoming of present times. Thus the idea is that the becoming past of times is brought about by the absolute becoming of present times. Absolute becoming is not a relational change and it is not a change that requires other changes to bring it about. Thus the absolute becoming of present times appears to be a suitable candidate for a change that could bring all Genuine Changes about. Broad appears to support the idea:

Similarly we have seen that [change in events with respect to pastness] involves [absolute becoming]. For the change of an event from present to past turned out to *depend on* the fact the sum total of existence increases beyond the limits which it had when our given event came into existence. (Broad 1923, p.67, added italics)

If this is correct, then the growing block theory has no problem with McTaggart's regress- all Genuine Changes that times undergo as they become (more) past, depend on the absolute becoming of future times as they become present.

However, the growing blocker should be wary of jumping to conclusions at this point. Whether or not the growing block really avoids the paradox ultimately depends on whether or not absolute becoming is itself a change that occurs *in* time, rather than a change *of* time. For if it was a change that occurred in time, then another vicious regress is launched. If absolute becoming occurs in time, then we require a super-time in which it can occur. This reminds of the regress we have encountered in my reconstruction of McTaggart's argument (cf. 3.4), where the only available change to bring Genuine Change about was an intrinsic change of the entire time-series, which itself must occur at a super-time. I argued then that the super-time must itself undergo passage, for otherwise we have explained dynamic facts about time with static facts about a super-time and have, in effect, reduced facts about passage to facts about a static super-time. If the super-time undergoes passage as well, the whole problem starts new and so we end up with an infinite regress of time-series. The regress is vicious, because on every stage of it the solution to the initial problem generates the same kind of problem.

The case here is very similar: If all Genuine Changes (of times becoming (more) past) depend on absolute becoming of present times and absolute becoming is a change that occurs *in* time, then we require a super-time in which this change occurs. If we don't want dynamic facts to reduce to static facts, that time-series must undergo exactly the same kind of changes, and thus requires a super-super-time which itself involves absolute becoming of present times- an infinite vicious regress of time-series is launched.

Thus the crucial question for the creationist in general is this: does absolute becoming occur *in* time or is it a change *of* time? In section (5.2) I have argued that in the case of presentism, a convincing argument against the claim that absolute becoming is a change *in* time, is to say that it is a replacement of time. A replacement of time is plausibly not a change in time, because it lacks a subject of change. This argument was originally presented by Zeilicovici with regards to the growing block theory (1981). Zeilicovici suggests that when a time comes into being on the growing block theory, then the time-series does not change but is *replaced* by a new time-series that has the new time as a novel member:

[t]he addition of a new moment means a new A-series (...). It emphatically does not mean change in time occurring to the older A-series, which (...) is being replaced. And the replacement itself is, of course, the very change of time which is the whole point of A-theory; it is certainly not a

change in time. (Zeilicovici 1981, p.520)

So according to this version of the growing block theory, the block does not 'grow' in the sense that the time-series adds successively more and more times. Instead, temporal passage consists in a continuous replacement of one time-series with another, where each new series comprises one more time than the series it replaced. For Zeilicovici there is 'simply is no valid reason' to think of absolute becoming, *understood as replacement* of time-series, as a change that itself occurs in time (cf. Zeilicovici 1981). If absolute becoming was a change in time, Zeilicovici argues, it would have a subject, but replacements of time-series lack such subject.

If it is plausible to hold that absolute becoming involves a replacement of the time-series, then Zeilicovici has a point- the replacement of the entire time-series lacks a subject of change and a subject of change seems to be a necessary requirement for change *in* time to occur. The question is, however, how plausible it is that the time-series is replaced. Note that presentists naturally understand absolute becoming as replacement, for according to them there is only ever one time, and when that time becomes past, it ceases to exist and is replaced by another present time. The case is not so obvious for the growing block theory, however. Standardly the growing block theory is not defined in terms of replacement, but in terms of growth. See for example Broad:

Nothing has happened to the present by becoming past except that fresh slices of existence *have been added* to the total history of the world. The past is thus as real as the present. (...) The sum total of existence is *always increasing*, and it is this which gives the time-series a sense [i.e. direction] as well as an order. A moment *t* is later than a moment *t'* if the sum total of existence at *t* includes the sum total of existence *t'* together with something more. (Broad 1923, p.66-7), my italics.

Whether Zeilicovici's reply to the 'change in time- objection works, depends crucially on whether his non-standard version of the growing block theory is plausible or not. Let me quickly summarize the problem again. For the growing block theorist, the Genuine Changes that times undergo when they become past must be brought about by the absolute becoming of present times. If, however, absolute becoming is a change that occurs itself in time, then we end up in an infinite regress involving infinitely many super-times. Zeilicovici has convincingly argued that a

replacement of times is not a change in time, for it lacks a subject of change. The all important question for the growing block theorist now is this: When a new time comes into being, is the time-series *replaced* by a new time-series or does the time-series '*grow*' by a time? The standard growing block theory, according to which time 'grows', will end up in an infinite regress. Zeilicovici's version would escape this danger. How feasible then is Zeilicovici's proposal?

The problem is that, whether or not the time-series grows or is replaced, depends on the identity conditions that time-series have. The question is also related to whether or not there are pluralities, such as sets, groups and series. If one thinks that in reality there are only the individual constituents of such pluralities, but that pluralities themselves are just constructs, then there seems to be no definitive answer to the question whether the time series grows when a present time comes into being, or whether it gets replaced by a new series with an additional member. If we define, for example, that a time-series is necessarily constituted by its terms, like a set is necessarily constituted by its members, then time-series cannot grow — the addition of a new time must mean a new time-series. If that is not the case, then the series can grow with the addition of a new time. But if series are constructs, then there will be competing views on what identity conditions series have, and although each theory might be sufficiently detailed, there might be no objective fact of the matter which of the specific views about series as constructs is correct.

Suppose that the debate was conducted between people who think that series are constructs. The opponent of the growing block theory might insist that absolute becoming is a change in time. She could just deny that absolute becoming involves a replacement of the time-series, defining a time-series in such a way that it can 'survive' the addition of a term. Given that the identity conditions of a time-series would be a mere conventional matter though, her criticism would just come down to denying that the growing block theory escapes the paradox, which is what was to be shown in the first place.

On the other hand, the growing blocker might insist that absolute becoming is not a change in time, but a change of time, because whenever a new time comes into existence, the old time-series is replaced by a new one. By doing so, however, she would just determine the identity conditions of a time-series in such a way that any addition of a term cannot be 'survived' by the

series. But this just amounts to claiming that the growing block theory escapes the paradox, which is what was to be shown in the first place.

At this stage of the debate, neither the growing blocker nor his opponent would have decisive arguments. Still, the growing blocker would at least have an advantage over the moving spotlight theory because, for the latter, the case is clear: the moving spotlight theorist cannot escape a vicious regress. For the growing block theory (who is also a sceptic about the existence of series) this is not so obvious, as it appears to be that there is no clear answer to the matter. Thus, while we must definitely reject the moving spotlight theory, the growing block theorist who does not believe in pluralities can at least count on the ‘bliss of ignorance’ whether her theory avoids the regress or not.

On the other side, if one were to be a realist about pluralities, that is, if one thought that pluralities such as series existed “in their own right”, then a further challenge would be to determine the identity conditions of such entities. Both questions however, the question of whether series exist and the question what, if they exist, are their identity conditions, go far beyond the limits of this thesis. Thus, whether temporal passage on the growing block theory is coherent or not depends on further theoretical commitments and is not clearly decidable given the facts of the present debate alone. It remains therefore only to say that we cannot bring the matter to a final conclusion.

Let me end the first part of this thesis with a quick summary of the main conclusions that have been established. I have argued that McTaggart’s argument against the coherence of temporal passage is based on an A-eternalist conception of time, according to which all times are ontologically ‘on a par’, but nevertheless tensed, by which I mean that times are future, present or past. Moreover, McTaggart assumed that there could not be time without change, but insisted that ‘real’ change must be more than just qualitative variation in time. From this he inferred that change must concern every single term in the time-series, but that the only respect in which a single term can change, is with respect to its A-properties. According to McTaggart, the change that terms undergo with respect to their A-properties is what constitutes temporal passage. I have called this change ‘Genuine Change’.

I then argued that McTaggart’s paradox about temporal passage is best understood in terms of the problem of change. The problem of change requires that a subject of change must instantiate incompatible properties, which must then be, on pain of contradiction, somehow indexed to different times. Analogously, the problem of Genuine Change requires its subjects (each term in the time-series) to instantiate incompatible A-properties, which must also be indexed to different times to avoid contradiction. In the case of Genuine Change, the indexing to different times can only be done by construing A-properties as relational properties and Genuine Change as relational change. I then defend the view that relational changes depend on other changes to be brought about, and merely relational changes depend on changes in other things to be brought about. The regress, I argued, is a regress where every term’s relational change occurs in virtue of another term’s relational change. It is infinite because, ultimately, every relational change must be brought about by a non-relational change, but there is no such suitable non-relational change. It is vicious, because it starts off with a problem and on each level of the regress, the solution to the problem generates the same kind of problem. I concluded that McTaggart’s paradox is a valid argument.

I then proceeded to argue that McTaggart’s argument does not depend on the assumption that there are events, or that events change, as it works with every term, that is, with every temporal item that does not occupy more than one temporal position in the series. I also defended the paradox against objections that deny the initial contradiction in the premise of McTaggart’s argument. The idea is that McTaggart’s paradox argument is successful, provided we accept A-eternalism.

Finally in the last chapter I have explored other ways to reject McTaggart. I argued that the best way is to reject A-eternalism and the idea that passage is Genuine Change. When we instead think of passage as absolute becoming, defined as coming to be real and/or ceasing to be real, there cannot be any problem of change in the first place. The proposal does however depend on the assumption that absolute becoming is a change *of* time, rather than a change that occurs itself *in* time. This is most plausible if we think of absolute becoming as involving a replacement of the time-series, such that, when a new time comes into existence, then the time-series is replaced by another time-series which comprises the new time as its latest member. But while it is obvious in the case of presentism that successive present times replace each other, it is not so clear in the case of the growing block. There it seems to depend on other philosophical convictions, such as

whether one believes in the existence of pluralities, such as series, and if so, what their identity conditions are. If this is correct, then it is not clear whether the growing block theory escapes McTaggart's paradox. The lesson to learn from McTaggart is that, if one supports the view that time passes, then one should be a presentist.

Here are, once again, the central claims as established in part one of this thesis:

- (i) McTaggart's temporal passage is change of terms with regards to their A-properties, that is, Genuine Change.
- (ii) Genuine Change must be construed as a merely relational change.
- (iii) Temporal passage, such construed, leads into a regress where every term's relational change occurs in virtue of another term's relational change.
- (iv) The regress is vicious because it starts off with a problem, which is such that the solution to the problem generates the same kind of problem.
- (v) Presentism can coherently construe passage as coming to be real and ceasing to be real ('absolute becoming') of times.
- (vi) Absolute becoming needs to be a change *of* time not *in* time, otherwise we get a new regress.
- (vii) A replacement of one time-series with another one is not a change that occurs itself in time.
- (ix) On the growing block theory, it is unclear as to whether the time-series gets replaced when a time comes into being, or whether it 'grows'. Therefore it is unclear if the growing block theory avoids the paradox.
- (x) A-eternalism cannot avoid the paradox.

In the second part of this thesis I am concerned with the question whether we can experience temporal passage. The conclusions that have been drawn in the first part are vital; they show that there is a logically coherent version of temporal passage, so that it is, in principle, not impossible to have veridical experiences of temporal passage. Moreover, the conclusions of the first part shall help me to determine what we are supposed to experience when we have alleged experiences as of passage.

PART II: THE EXPERIENCE OF TEMPORAL PASSAGE

Introduction (part II)

In the first part of the thesis I have focussed on finding a coherent understanding of temporal passage. I have argued that temporal passage should be understood as 'absolute becoming', that is, as the coming into (and going out of) existence of times. At first sight, absolute becoming is compatible with presentism and the growing block view. I have also argued though that there might be no definite answer to the question whether or not temporal passage is coherent on the growing block theory. (cf. chapter 5.5). For the remainder of the thesis I shall therefore merely consider the presentist's notion of temporal passage.

In the second part of the thesis I shall focus on the experience of temporal passage. More precisely, I argue that we cannot infer that time passes from experience. I will show that the argument behind the idea that we can infer passage from experience is unsound. Briefly put, the argument takes it for granted that we experience temporal passage, and that the best explanation for this is that time really does pass. With an inference to the best explanation, the defender of temporal passage then concludes that time really passes. In response, static theorists who reject that argument usually adopt some kind of error theory, according to which our experience of passage is illusory. As a consequence they find themselves confronted with the general implausibility charge that all error theories have to battle with, along with the difficult challenge to explain why we have these illusions and how they are generated. The static theorist, I shall argue, concedes too much. Rather than defending an error theory, the static theorist should deny that we can have experiences of temporal passage at all.

The first chapter of part II, chapter six, introduces the argument in question, which I call with Le Poidevin (2007) the 'Argument from Experience' (AfE). I discuss and evaluate several ways to resist AfE. I argue that the best strategy against AfE is to deny that we can have experiences as of temporal passage. In chapter seven I argue that to experience temporal passage is to experience events undergoing absolute becoming. Although I concede that there might be more than one way to represent passage in experience, I argue that if we want to infer that time passes from experience, then the experience should be such that it would best explained by the fact that time passes. I then specify a necessary condition for this to be the case. I argue that there are no

other experiences that meet this condition apart from the experience as of absolute becoming. In particular, I reject the view that to experience passage is to experience 'ordinary change' and the view that we can infer passage from experiences as of presentness. I conclude that only experiences of absolute becoming meet the necessary condition to be best explained by temporal passage. The opponent of AfE can now either say that these experiences are illusory, or deny that we have such experiences in the first place. Given that the latter strategy is the better one, I argue in chapter eight that we cannot have experiences as of events undergoing absolute becoming. I will assess the claim that we have experiences as of absolute becoming in the light of three major accounts of temporal perception and argue that we cannot represent absolute becoming in experience.

Chapter Six: The Argument from Experience

The aim of chapter six is to introduce the 'Argument from Experience', and to set up the debate by identifying and evaluating various strategies to object to AfE. The chapter is divided into five sections. The first section begins with a few caveats, some assumptions that I make and some restrictions that apply to my argument. I will also introduce some more terminology. The second section shows how widespread the intuition that we can know passage from experience is, and how frequently proponents of the dynamic theory of time use the intuition to support their view. The third section introduces the argument behind the claim that we can know passage from experience, the 'Argument from Experience' (AfE). In the fourth section I point out that in order for AfE to avoid question begging, the premise that we experience temporal passage ought to leave it open whether that experience is veridical or not. In the last section I present three different ways to argue against AfE and argue that the two most promising objections are either to deny that we have experiences of temporal passage or to deny that the alleged experiences of temporal passage are best explained by the fact that time passes.

6.1 A few caveats and some (more) terminology

Before I begin, I should mention a few caveats. Firstly, I shall assume that perceptual experiences have *representational contents*, where the contents of one's experiences 'represent the world as being a certain way' (Peacocke 1992, p.61), and that experiences are the kinds of states that can be accurate or inaccurate. The content at issue is conveyed to the subject by her experience and can be specified by its accuracy conditions, as is standardly assumed for beliefs. If my experience is accurate if and only if there is a teapot in front of me, then the content of my experience is that there is a teapot in front of me.¹ In other words, contents of perceptual experiences are conditions under which experiences are accurate. The view I am assuming is a weak content view, which is compatible with, but does not entail, the stronger thesis that perceptual content is propositional (Siegel 2010a, p.73). Thus understood, the view that

¹ Note that accuracy conditions for perceptual experiences do not allow for necessarily true or necessarily false propositions such as 'the experience is accurate if and only if there's a teapot in front of me or $2+2=5$.' This makes sense, given that the contents of perceptual experience express apparent *a posteriori* truths, and that these truths are standardly contingent.

experiences have contents is widely supported in contemporary debates about perceptual experiences (cf. Siegel 2010a, p.27).

Secondly, the limited extent of this thesis forces me to concentrate only on visual experiences.¹ I chose vision, as opposed to any other sensory modality, because most arguments in the philosophy of perception refer to visual experience and therefore the debates are most thoroughly analysed with regards to visual experience. I believe, however, that my argument is sufficiently general to be applicable to other sensory modalities.

The third caveat is that, although I shall argue that we cannot represent passage in experience, I do not intend to give a worked out explanation as to why we think that we experience time's passage. I shall merely suggest that we have the general disposition to believe that time passes when we experience change. My main intention however is to refute the view that we can infer passage from experience, therefore I shall not attempt to give an account for why and how we generate the belief that time passes.

Lastly, my argument does not purport to show that time does not pass, or that dynamic theories of time are false. What I intend to show is merely that we cannot solve the question of whether time really passes or not by arguing from experience. It has been argued that if it is true that we cannot experience temporal passage, then there would be no reason to endorse tense realism or the A-theory, because it is the intuition that we experience passage that indicates the need for theories that account for passage in the first place (cf. Prosser 2007). While this might well be the case, my aim is not to refute dynamic theories. It is more modest. I have shown in the first part that temporal passage, understood correctly, is logically possible. In the second part, I argue that experience cannot tell us whether time passes or not. I show with my thesis that any strategy in the debate about whether time passes or not that seeks support from our perceptual experiences is misguided. Given that temporal passage is a logical possibility, and that, pre-philosophically, we all tend to believe that time passes, there is still a metaphysical question to be answered. But arguments from what we experience can certainly not help to settle this question.

¹ I will sometimes use 'experience' as a shorthand for 'visual perceptual experience'.

6.2 An intuitive start?

In the first part of this thesis I have shown that temporal passage, rightly understood, is a coherent concept. This does not yet amount to saying that time really passes. There are many metaphysical and semantic arguments that intend to show that time passes. Among others, there is for example the classic argument that change requires temporal passage, inspired by McTaggart's view that there can only be change if time passes. (cf. 2.2, 2.3).² Some may argue that temporal passage is reflected in the dynamic tensed structure of language. I shall come back to this point in chapter seven. A further argument is found in Prior's famous paper 'Thank Goodness That's Over' (1959), where he famously claims that we need the passage of time to make sense of our emotional attitudes towards events. One of the most persistent and powerful arguments, however, comes from a very different angle. It is an intuitive argument that draws on our everyday experiences. The argument is that passage is 'given' to us in experience. That time passes seems evident to us whenever we wait for some event to take place, dwell on old memories, or try to hold on to the present moment. The idea is that the experience of temporal passage is a fundamental aspect of our lives and the best explanation for these experiences would be simply that time really passes. It is undeniable and only common sense that there is some phenomenon to be explained, a phenomenon which is unique to time and our experience of it. Bearing in mind that experience is a generic term used to include states involved in veridical perception, illusion and hallucination, the claim that we have experiences of temporal passage has not been denied prior to the present century.³ Here are some examples from the literature that show the widespread consensus on this matter:

(i)

In practice, the most influential argument in favour of the objective present and the objective flow of time rests on an appeal to psychology- to our experience of time. It seems to us that time flows, the argument runs, and surely the most reasonable explanation of this is that there is some genuine movement of time which we experience, or in which we partake. (Price 1997, p.14-5)

² McTaggart himself would not have listed this argument as an argument for temporal passage. Instead he argues that temporal passage is incoherent, therefore there cannot be change. For those who do not want to reject the notion of change though, McTaggart's claim serves as a *reductio ad absurdum* argument for the occurrence of temporal passage.

³ To my mind, the first to deny the view that we experience temporal passage are Prosser (2007, forthcoming) and Dainton (2011).

(ii)

Let me begin this inquiry with the simple but fundamental fact that the flow of time, or passage, as it is known, is given in experience, that it is as indubitable an aspect of our perception of the world as the sights and sounds that come in upon us (...). (Schuster 1986, p. 695)

(iii)

[That time passes] is not some insignificant part of experience but rather a central one which is with us all the time. (Schlesinger 1982, p.501)

(iv)

(...) there is hardly any experience that seems more persistently, or immediately given to us than the relentless flow of time. All of us are greatly concerned about time's swift passage, and wonder why 'there is no arresting of the vast wheel of time'. (Schlesinger 1991, p.427)

(v)

If temporal passage *is* unreal, why do we have such a strong intimation that our experience would not be as it is if time were *not* to pass? This question has an obvious and quite plausible answer: we find passage in our experience, and we are naturally inclined to believe what our experience tells us.⁴ (Dainton 2011, p.382)..

(vi)

The final motive for the attempt to consummate the fourth dimension of the manifold with the special perfection of passage is the vaguest but the most substantial and incorrigible. It is simply that we *find* passage, that we are immediately and poignantly involved in the jerk and whoosh of process, the felt flow of one moment into the next. Here is the focus of being. Here is the shore whence the youngster watches the golden mornings swing toward him like serried bright breakers from the ocean of the future. Here is the flood on which the oldster wakes in the night to shudder at its swollen black torrent cascading him into the abyss.

(Williams 1951, p.465-6)

(vii)

Above and beyond and before all these considerations, of course, is the manifest fact that the world is given to us as changing, and time as passing... all the philosophizing in the world will not convince us that these facts are mere illusions (...). In sum then, it is a central aspect of our basic

⁴ Dainton himself does not endorse the view that we can experience temporal passage.

picture of the world that time passes, and that in virtue of that passage things change. (Maudlin 2007, p.135)

These quotes show how ubiquitous the intuition that we experience passage is, and how defenders of the dynamic theory of time standardly appeal to it to motivate their view. If we experience the passage of time, then the dynamic theory has a very plausible, neat and simple explanation- roughly speaking, we experience passage, because there *is* passage. Static theories are pushed into a defensive position. They have to explain why we experience passage even though time is static and they have to give an account of how these illusions are generated. If we really have experiences of passage, then the dynamic theorist certainly has an intuitive advantage over the static theorist.

Note that not only defenders of the static theory of time might want to reject the idea that we experience passage. Somebody might think that time really passes, but still reject the idea that we can experience passage. To avoid confusions, I shall call the person who defends the idea that we can experience temporal passage 'dynamic experience theorist', and the person who rejects it 'static experience theorist'. From what I just said it follows that one can be a dynamic theorist, somebody who thinks that time passes, while also being a static experience theorist, if one denies that we experience time's passage. Similarly, one can be a static theorist, thinking that time does not pass, while also being a dynamic experience theorist, namely if one thinks that we are suffering from the illusion of temporal passage. Put in these terms, my claim is that standardly both, dynamic and static theorists, are dynamic experience theorists. I shall argue however, that the static theorist would fare much better with being a static experience theorist.

For the remainder of this thesis, I shall argue that we cannot know that time passes from experience, either because the experiences are not of the right kind, or because we cannot perceptually represent temporal passage at all. Consequently, the dynamic theory has no intuitive advantage against the static theory. First of all, we will have to take a closer look at the argument behind the intuition that has been expressed by all of the quotes above. In the following section I will introduce that argument, and then I will go on to discuss several ways to resist it.

6.3 The Argument from Experience

The quotations above express the intuition that the experience of time's passage is one of the most fundamental and certain human experiences, above and beyond any reasonable doubt. The intuition is that it seems to us as if time passes and this seeming is so undeniably and strongly given in our everyday life that, avoiding the conclusion that we are deeply deluded creatures, we ought to make room for passage as an objective feature of the world. Thus dynamic theories are motivated by the tacit assumption that we are not constantly and systematically deceived by our senses and that any *error theory* which claims the contrary, must meet the huge challenge of making it plausible that all of us are constantly suffering from an illusion.⁵ The argument that is implied in the quotations can be summarised with what I will call with Le Poidevin (2007, p.77) the '*Argument from Experience*', from here on AfE.⁶ In its most simple form, AfE can be expressed as follows:

(AfE):

- (1) All of us constantly experience time passing.
- (2) The best explanation for these experiences is that time really does pass.
- (3) Therefore time passes.

Premise one expresses the intuition that passage is represented in our experience and that we have these experiences all the time. Quotations (iii), (iv), (vi) and (vii) especially highlight the strength of the intuition. The idea is that experiences of temporal passage are not only had by some of us, sometimes. Experiences of temporal passage are supposed to be had by all of us, always. Premise two claims that the experience of temporal passage is best explained as an experience of some genuine feature in the world. The conclusion is supposed to be an inference to the best explanation. Supposedly the idea is that we know that the first premise is true just by introspection. Given the ubiquity of the experience in question, it is more plausible to think of passage experiences as veridical, than to think of them as illusory. From there on, we can make

⁵ The term 'error theory' is due to J.L. Mackie and describes a theory according to which everyday thought is so infected by mistaken philosophical views that it is widely in error, cf. (Blackburn 2008).

⁶ Le Poidevin's argument actually refers to a bundle of arguments. I have taken his label to identify what I take to be the most important argument that is common to all dynamic arguments of this sort.

an inference to the best explanation to get to the conclusion, where the general principle employed is of the following form⁷:

If p is the best explanation for q, and q, then p.

As it stands, AfE is still not very clear. The problem is that it is unclear what the content of an experience of temporal passage is exactly supposed to be and when it is best explained by the fact that time passes. Thus, as long as we do not know what it means to have an experience of passage and what principles are employed in judging some explanation to be the best, it is far from obvious how the argument is supposed to work. A great part of the challenge to argue against AfE is thus to make entirely clear what the argument is about.

In the next section I clarify that the first premise must leave it open whether the experience of temporal passage is accurate or not.

6.4 Experiencing versus perceiving

Although AfE's first premise is supposed to be intuitively true, it is, as it stands, not entirely clear what it says. According to the (standard) definition of experiences as given above, 'experience' is a generic term for veridical states, such as perceptions, and non-veridical states, such as illusions and hallucinations. Perceiving presupposes a perceptual relation between the perceiver and the object that is perceived. In that sense, perceiving that p is factive: a subject S perceives that p, only if p. In contrast, experiencing that p (in the sense that is not perceiving) is not factive. For S to experience that p, it suffices for S to experientially represent that p. Standardly, it is assumed that the experience is 'accurate', or 'correct', if what is represented is really the case and it is 'inaccurate' or 'incorrect' if what is represented is not the case. In the former case, we speak about a *veridical* experience, in the latter case about a *non-veridical* or *illusory* experience.⁸ In cases of non-veridical experience, perception and experience come apart: if your experience represents that p, even though it is not the case that p, then you have an experience of p without perceiving

⁷ The principle from the 'inference to the best explanation' has first been introduced by Gilbert Harman (1965); and has been further developed by Lipton (1991).

⁸ Not all theories of perception accept that experiences have accuracy conditions. But, as I said at the outset, I shall assume this view of perception, although I think that my argument could be reformulated in terms of a different account of perception.

that p. In contrast, veridically experiencing that p usually also implies perceiving that p. But the two cases can also come apart. It might be that S's experience veridically represents that p, without S perceiving that p, for example in cases of *veridical hallucination*, where a subject hallucinates that p when p is in fact the case.⁹

As it stands, (1) could refer to experiencing that p, in the sense that it is *left open* as to whether the experience is veridical or not, or refer to perceiving that p, where perceiving that p would already *entail* that p. Thus we can distinguish between

(1_R) All of us constantly represent temporal passage in experience.

or

(1_P) All of us constantly perceive temporal passage.

Evidently, (1) needs to be understood as (1_R) and not (1_P). (1_P) is true, only if time really passes. (1_R) is neutral as to whether time really passes or not, thus it could be true in a static world, namely if my experience incorrectly represents that time passes. If (1) were to be understood as (1_P), then AfE would beg the question for the premise would already entail what the argument is supposed to establish, namely that time passes. Thus understood, (2) would be unnecessary and no static theorist would agree with (1), for no static theorist would say that we *perceive* temporal passage. It follows that premise (1) of AfE must be understood as (1_R), that is, (1) must leave it open whether the experience is veridical or not.

Next, I shall present four possible ways to object to AfE. I will argue that the standard objection is not a good strategy against AfE.

6.5 How to reject AfE

There are three different ways to object to AfE:

(INFERENCE) The fact that time passes does not follow from it's being the best explanation for our experience.

⁹ See for example the case of veridical hallucination as mentioned for example in Lewis (1980).

(NO EXPERIENCE) We do not have experiences of temporal passage.

(EXPLANATION) Our experience of temporal passage is not best explained by the fact that time passes.

(INFERENCE) denies that the conclusion follows from the premises. (NO EXPERIENCE) rejects (1). (EXPLANATION) rejects (2). If either (1) or (2) of AfE fails, then the argument is not sound and thus would not establish the conclusion. Let me go through each of the objections in turn.

6.5.1 INFERENCE

One way to object to AfE is to deny that (3) follows from (1) and (2). The strategy is to admit that we have experiences as of time passing and to admit that the fact that time passes is the best explanation for these experiences, but disagree with the conclusion that time really passes. The idea would be that even the best explanation 'p' would not support the conclusion that p. In other words, the objection is to reject the principle from the inference to the best explanation. Such a position is a sceptic's position. It should be rejected because of its very bad consequences for the acquisition of any justified belief or knowledge. That said, there is of course room to doubt and discuss the inference to the best explanation. One might be in general sceptical about this type of inference, or insist on a more precise specification for what makes an explanation the best explanation. A deeper analysis of these issues, however, would lead too far astray of my main points. I will thus assume that the principle from the inference to the best explanation is true. In other words, I will assume that if p is the best explanation for q, and q, then p.

6.5.2 NO EXPERIENCE

This objection denies that we have experiences of temporal passage. It deprives the dynamic theory of its alleged intuitive advantage and blocks the inference to the best explanation. If there are no experiences to be explained in the first place, then the argument cannot get off the ground. As a result, the static theorist (who, in this case, would be also a static experience theorist) never has to argue from the defensive corner in the first place. Of course, there would be still a demand to explain why we nevertheless think that we experience time as passing. One

thing one might say is that we form the belief that time passes from the experience of some other temporal phenomenon. In any case, this is a different project altogether.

In the attempt to resist Afe, this strategy has been curiously underexplored. Presumably the reason is that most people find the idea that we experience passage so intuitively compelling that they do not waste much thought on whether it is actually true. I shall argue, however, that this is a mistake, because if we think carefully about what it would mean to experience temporal passage, then it is not obvious at all that we can. Strategically this is the most elegant and effective objection because if the Dynamist is not allowed to her first premise, then the argument can be blocked from the outset.

6.5.3 EXPLANATION

(EXPLANATION) doubts whether some state of affairs SA is the best explanation for one's experience of SA. The objection can be understood in a general way and in a specific way. Understood generally, (EXPLANATION) appears to doubt whether we can, *in principle*, ever know whether a certain explanation is the best explanation for some explanandum. There might always be a *better* explanation which we are not aware of. Given that we can only ever know whether some explanation is the best of all explanations *already known*, (rather than the best explanation *simpliciter*), general (EXPLANATION) claims that we are never justified in making an inference to the best explanation.

While I am somewhat sympathetic to this view, it is a slippery slope, since all scientific explanations make use of the inference to the best explanation. It seems to me that a rejection of this principle would set the standards for what can be known too high- it would make empirical knowledge impossible. It is trivially true that we can only ever give the best explanation that we know, and it is also true that there could always be a better explanation that we are not (yet) aware of. But although we might strictly speaking never be in the position to *know* whether an explanation is really the best explanation, it does not mean that it could not actually *be* the best explanation. If we do not want to exclude the possibility of ever gaining empirical knowledge, we should assume that the best explanation of those known is the best explanation *simpliciter*, until the contrary is shown.

Understood specifically, the idea is that the fact that time passes does not best explain our experiences of temporal passage. Note that these two objections are separate: one could agree that there is a best explanation to be found *in principle*, but reject that the explanation offered in some concrete case is the best explanation for the explanandum. One case where the fact that time passes would not be the best explanation for one's experience of temporal passage, would be when our experiences were either hallucinations or illusions. To deny that our experiences are veridical is the most popular strategy among static theorists, that is, theorists who deny that time passes.¹⁰ Popular it may be, this is not necessarily the best strategy for the static theorist, as it puts her in an uncomfortable position. Once it is agreed that we all constantly have experiences of temporal passage, it just seems implausible that an experience as ubiquitous as that could be an illusion. Paul Davies, for example, makes a typical remark along these lines:

Does our impression of the flow of time, or the division of time into past, present and future, tell us nothing at all about how time *is* as opposed to how it merely appears to us muddle-headed humans? (...) As a human being, I find it impossible to relinquish the sensation of a flowing time and a moving present moment. It is something so basic to my experience of the world that I am repelled by the claim that it is only an illusion or misperception. It seems to me that there is an aspect of time of great significance that we have so far overlooked in our description of the physical universe. (Davies 1995, p. 275)

By accepting the assumption that we experience temporal passage, the static theorist is forced to declare an allegedly fundamental feature of experience as illusory. The onus seems to be on her to explain why and how it is that we all suffer from the illusion of temporal passage. That said, how implausible this objection really is depends to a great degree on the exact theory given. One might for example argue that experiences of temporal passage are experiences of static or 'neutral' temporal phenomena, such as successions of events, that are in some way *altered* by one's cognitive states in such a way that one experiences these phenomena as dynamic.¹¹ Or one might think that we are 'hard-wired' to experience time (temporal phenomena) as passing. That is, one could say that this is just how the visual system works, or argue even stronger, in a Kantian spirit, that to experience time in this way is a necessary condition for us to have

¹⁰ Philosophers who have argued along these lines include Mellor (1998), LePoidevin (1991), Oaklander (1993) and Paul (2010).

¹¹ One plausible mechanism that could account for this is '*cognitive penetration*'. On cognitive penetration see for example Pylyshyn (1999), Siegel (2011), Macpherson (2012). I will come back to this in more detail in chapter eight.

temporal experiences at all. In any case though, the static theorist who chooses this strategy needs to say something more about how and why the illusion of temporal passage is generated.

Note that to argue that our experiences of temporal passage are non-veridical is not open to all theorists. Some theories rule out the possibility that we could represent something that is never the case. Theories of this sort would claim that an experience represents property F only if experiences of that type are normally caused by instances of F (cf. Siegel 2009, p.519). Differently put, someone who holds this view denies that one can have an experience of F without F being (ever) instantiated. Thus, given this view, we could not have experiences of passage if time did not pass. If we did experience passage, then that would already imply that time really passes, because if time did not pass, then the experience could not be typically caused by time's passage, and thus could not be had at all. Thus static theorists, who held this view, could not argue that experiences of temporal passage are non-veridical.

That said, somebody who wanted to reject AfE by saying that our experiences of temporal passage are in some way altered by other cognitive states, or that we are hard-wired such that we could not experience time other than passing, would not even have to insist that these experiences are non-veridical. They could claim that, even if those experiences were veridical, they *would not be best explained* by the fact that time passes, because their causal history involved not only the fact that time passes. I shall come back to these cases in chapter eight.

Finally, there is yet another class of alleged temporal passage experiences that would not be best explained by the fact that time passes. One might think that there is more than one way to represent temporal passage. One might for example think that to experience temporal passage is to experience succession. However, if the experience could be accurate even if time did not pass, then it cannot be best explained by the fact that time passes. I shall come back to these cases in the next chapter.

To conclude, of the three arguments against AfE I presented, the most simple and effective objection would be to deny that we have experiences as of temporal passage (NO EXPERIENCE). The best strategy is to first specify what kind of experience would be, if accurate, best explained by the fact that time passes, and then show that we cannot have these kinds of experiences. This is the strategy that I shall pursue for the rest of this thesis.

I have shown in this chapter that the view that we can come to know the passage of time through experience is very common and frequently used by dynamic theorists to motivate and support their thesis. I have introduced the argument behind that intuition, which I called the Argument from Experience (AfE). I have presented three possible objections to it. One objection denies the principle from the inference to the best explanation. I dismissed it. The second objection is to deny that we have experiences as of temporal passage. The last objection argues that one's experiences of temporal passage are not best explained by the fact that time passes. I specified three types of passage experiences that would not be best explained by the fact that time passes. Firstly, illusions of temporal passage. Secondly, veridical experiences of temporal passage which are partially caused by other (non-experiential) mental states of the subject. Thirdly, experiences that are such that their content does not entail that time passes. I then argued that the best strategy against AfE is to determine which experience would be best explained by the fact that time passes, and then deny that we can have these experiences.

In the next chapter I argue that although there may be several ways to represent passage in experience, only experiences as of events undergoing absolute becoming would be, if accurate, best explained by the fact that time passes.

Chapter Seven

The 'Look' of Temporal Passage

In the last chapter I introduced the Argument from Experience, (AfE):

(AfE):

- (1) All of us constantly experience time passing.
- (2) The best explanation for these experiences is that time really does pass.
- (3) Therefore time passes.

My overall aim is to show that AfE fails. I have presented several possible objections, and have argued that the best strategy against AfE is to first determine what kind of experience would be best explained by the fact that time passes, and then deny that we can have these experiences.

The aim of this chapter is to determine what kind of experience would be best explained by the fact that time passes. In other words, the task is to specify premise (1) in such a way that premise (2) is true. The chapter has five sections. In the first section I claim that to experience temporal passage is to experience events undergoing absolute becoming. I will show that differences between substantialist and relationist accounts of time do not make a difference to how passage would be perceived. In the second section I will reply to an objection by Siegel, according to which there may be no or very little phenomenal constraints on how we represent things in visual experience. I acknowledge that there might be more than one way to represent passage in visual experience. However, I then argue that if one wants to infer from experience that time passes, the experience must be at least phenomenally constrained in one way: Its phenomenal appearance, or 'look', must be such that the look is best explained by the fact that time passes. I take this to be a phenomenal constraint in the relevant sense. A necessary condition for this to be the case is that the experience could not be accurate if time did not pass. For the remainder of the chapter I will argue that apart from experiences of events undergoing absolute becoming, no other experience meets the necessary condition to be best explained by the fact that time passes. In particular, I will argue against the common view that experiences of "ordinary change" or experiences (as) of presentness are sufficient to constitute the experience of temporal passage. In the third section, I argue that one can only infer duration but not passage

from experiences of ordinary change. In the fourth section, I argue that it is either not possible to represent presentness in visual experience, or only in such a way that these experiences would, even if accurate, not be best explained by the fact that time passes. In the last section I will argue that *only* veridical experiences as of absolute becoming would be such that one could infer passage from them.

7.1 Substantialism, relationism and the experience of time

In the first part of this thesis I have argued that temporal passage must be constituted by times becoming part of reality (becoming real) and ceasing to be part of reality (ceasing to be real), that is by the absolute becoming of times (cf. 5.1.2). This part is about the experience of temporal passage. Given that temporal passage is constituted by the absolute becoming of times, it seems natural to think that to experience temporal passage is to experience the absolute becoming of times. In this section I am going to focus on how the difference between substantialist accounts of time and relationist accounts of time relates to our perceptual experience of time.

Time can be understood in a substantialist or in a relationist way.¹ What I am concerned with in this section is whether the difference between relationism and substantialism would make a difference to how temporal passage looks in visual experience. That is to say, if relationism about time was true, and our perceptual representation of passage accurate, would the content of such an experience differ from the content of an accurate perceptual representation of passage if substantialism was true? The answer does not particularly depend on the experience of temporal passage, but rather on the experience of time in general. If perceptions of substantialist time differed from perceptions of relationist time, then perceptions of 'substantialist temporal passage' (temporal passage in a substantialist world) would also differ from perceptions of 'relationist temporal passage' (temporal passage in a relationist world). I will show that the difference between substantialism and relationism does not bear on the content of one's perceptual experience of time or temporal passage. For relationism, and for (the different kinds of) substantialism, to perceive temporal passage would be to perceive events undergoing absolute becoming. In what follows, I shall give a brief description of each view,

¹ I have explained the notion of substantialist and relationist accounts of time in chapter 1.3.

relationism and substantivalism, and then analyse what it would be, if the view was true, to perceive temporal passage.

For relationists,² time is the entirety of all events and the temporal relations they instantiate. Events are not *in* time but really constitutive *parts of* time, analogous to the way our arms and legs are not in our body but constitutive parts of it (cf. Faye 2006). Relationists' moments reduce to simultaneous events at temporal *locations*. On this view, a succession of moments is nothing but a succession of events, thus for the relationist to perceive time is to perceive a succession of events.³ Given that temporal passage is a succession of times constituted by absolute becoming, and that relationist times are simultaneously located events, to perceive relationist temporal passage would be to perceive the absolute becoming of events.

In contrast, substantivalists think that time is an entity *in* which events are located. That is to say, substantivalists think of time as composed of the 'bare time' understood as an entity in itself, *and* the events located 'in' it, where typically events are not essential for time to exist.⁴ A useful metaphor that I mentioned before (cf. 1.3.) is to think of substantivalist times as 'containers', that can be 'filled' with events located at that time. In what follows it will be important to keep the distinction between bare times and events located there in mind. I will call bare times 'containers'. Given that, for substantivalists, time is something 'over and above' the events located in it, the question is whether for the substantivalist to perceive passage would be something *more* than to perceive the absolute becoming of events, namely to perceive the absolute becoming of events *and* of containers.

Among substantivalists there are two views regarding the nature of time (cf. 1.3). Some substantivalists think that time is an abstract entity, typically understood as an abstract set of concrete events (Faye 2006). Other substantivalists think of time (or space-time) as a concrete

² By relationist I mean the metaphysical relationist about times, I do not mean to discuss perceptual relationism about temporal experience.

³ Note that it would not suffice to experience a single (atomic) event in order to experience time, for such an event would have no temporal extension and we cannot experience an event without temporal extension anymore than we can experience an object without spatial extension. This is not to say that we could not abstractly divide what we represent in experience into instantaneous or point-sized parts.

⁴ Substantivalism has thus room for 'empty time', time without anything located in time, and for time without change. For a defence of the latter see for example Shoemaker (1969).

particular in which events are located (cf. Nerlich 1994).⁵ For ease of exposition, let us call the former *abstract substantivalists*, and the latter *concrete substantivalists*. For the abstract substantivalist, times are "abstract containers", with concrete events located in them. To perceive not only the events located at times, but also the containers themselves, the abstract substantivalist would have to be able to represent abstract objects in perceptual experience. This is not possible. I take it that the claim I am making is not controversial. At least to my mind, I cannot think of anybody who would defend that we can perceptually experience abstract objects, or of any reason why one would defend it.⁶ The reason for why we are not able to perceptually represent abstract objects has presumably to do with the fact that abstract objects, as I understand them, are not located in space and time. Nothing can have visible properties, such as a colour and a shape, if it is not located in space and time. An analogous argument would hold for other sense modalities. Nothing can smell, taste, sound or feel some way, without being in space and time. Therefore we cannot perceptually experience abstract objects. Given that we cannot perceptually experience abstract objects, only events but not the containers will feature in the abstract substantivalist's perceptual experience of time. Thus for an abstract substantivalist to perceive temporal passage would be to perceive the absolute becoming of events, just as for the relationist.

For the concrete substantivalist, time is just as concrete as the things located in it. That is to say, for the concrete substantivalist, containers and their contents (events) are concrete entities. Thus, if concrete substantivalism is true, then one might think that it should be possible to perceive not only events, but also the time containers in which the events are located. That is, one might be tempted to say that, in a concrete substantivalist world, there is no *a priori* reason for why we should not be able to perceive time containers.⁷ As a matter of fact though, we don't perceive time containers. As Dainton remarks,

[t]he fact that we don't perceive time itself doesn't mean that time is necessarily unperceivable:

⁵ For a useful discussion about whether time is an abstract entity or a concrete particular, see for example Faye (2006).

⁶ It is conceivable that somebody might argue that when we see a chair, say, we do not only see its shape, colour and so on, but also the universal 'chairness'. Or one might argue that we can see abstract numerals. For example when I see two books, the idea is that I also see the abstract number 2. I do not actually know of anybody who would hold this, or whether such a position would be tenable. But it seems to me that in both cases one could reply by saying that the 'seeing' of the abstract object appears to be *dependent on* the seeing of the concrete objects, or that the abstract objects are seen only in virtue of the concrete objects being seen. If that is the case, then I could still hold on to the point that we do not actually see abstract objects in the same sense as we see the concrete ones.

⁷ Graham Nerlich for example argues that space-time is a concrete particular with a shape, and that we could perceive it if it was 'warped'. (1994).

there may be logically possible worlds where space-time is [concrete] substantival, and as easily perceived by its inhabitants as any other part of the material furniture of their world. But our universe is not of this kind. It may well [be] that space-time in our world is [concrete] substantival—if so, then space-time can rightly be regarded as a material object—but it is not an object that is readily or directly detectable by our senses or any other instrument. (If it were, the debate between [concrete] substantialists, and relationists would have been settled long before now.) (cf. Dainton 2011, p.385).

That said, it is not entirely clear to me whether it is just a contingent fact about our world that we could not perceive time even if it was concrete substantialist. If my argument holds that we can only perceive what is located in time and space, then it would be a priori true that we could not perceive time containers even if they were concrete substantialist. The reason is that times, or more precisely, time containers are neither located in space, nor are they located *in* time, for they *are* time. Therefore, even if concrete substantivalism is true, to perceive passage would be just to perceive the absolute becoming of events. It follows that on all three accounts, relationism, abstract substantivalism and concrete substantivalism, to perceive temporal passage would be to perceive the absolute becoming of events. At any rate, this is what I shall assume from here on.

In the next section, I shall discuss an objection to the view that to experience temporal passage is to experience events undergoing absolute becoming.

7.2 The phenomenal constraint

In the last section I said that experiences of temporal passage are experiences of events undergoing absolute becoming. That means, if I want to argue that we cannot visually represent temporal passage, I will have to argue that we cannot visually represent absolute becoming. One might complain though that there is more than one way to visually represent things in experience. Thus if we cannot visually represent absolute becoming, it need not follow that we cannot visually represent temporal passage. In ‘The Visual Experience of Causation’, Siegel discusses a similar objection (Siegel 2009). Siegel argues in her paper that we can represent causal

relations in visual experience. She then discusses an objection to her claim, which she ascribes to Sosa and Tooley.⁸ She states the objection as follows:

(Causality Objection)⁹

1. If S’s visual experience represents that a causes b, then that visual experience represents that (a, b) instantiates a law.
2. For any events (a, b), one’s visual experience cannot represent that (a, b) instantiates a law.
3. Therefore one cannot represent in visual experience that a caused b. (Siegel 2009, p.538)

My own argument to the conclusion that we cannot represent temporal passage in visual experience, could be presented in an analogous way:

(Passage Objection)

1. If S’s visual experience represents that time passes, then that visual experience represents that events undergo absolute becoming.
2. One’s visual experience cannot represent absolute becoming.¹⁰
3. Therefore, we cannot represent temporal passage in visual experience.

Against (Causality Objection), Siegel holds that it does not follow that if one’s experience represents that p, and p entails q, that one’s experience represents that q. (cf. *ibid.*). For intuitive support, Siegel cites an analogous case involving holes. Although it is hard to say what holes are, it is possible to have experiences as of holes. Some people think that holes are immaterial particulars. Others take them to be negative parts of material particulars.¹¹ ‘When the cheese appears to have a hole in it’ she asks, ‘does it appear to host an immaterial particular or does it appear to have a material part — or neither or both?’ (Siegel 2009, p.539) The best answer, she says, is ‘neither’: one can visually represent that there is a hole without visually representing immaterials or negative parts of material particulars. Experience appears to be mute on these matters. If she is right, then this could be a problem for my own view that to experience

⁸ The objection is relevant with regards to ‘nomic generalism’ about causation, according to which two (or more) events are causally related only if the relation they stand in instantiates a law (Sosa and Tooley 1993, p.13).

⁹ This is my own name for the objection.

¹⁰ I have not given an argument for the second premise yet. I shall do so in chapter eight. I am only making some structural points about the argument here.

¹¹ The first view is defended among others by Casati and Varzi (1994). The second by Hoffman and Richards (1985).

temporal passage is to experience the absolute becoming of events. For if she is right, then one could visually represent temporal passage without visually representing absolute becoming.

Now, to defend myself from Siegel's objection I could either argue that she is wrong or that the case about holes and the case about causality is disanalogous to the case about temporal passage. But Siegel is clearly right. To visually represent some object, one does not need to visually represent the physical, chemical or metaphysical 'make-up' of that object. I can have a visual experience as of a glass of water, without having a visual experience as of H_2O . I can visually represent redness, without visually representing a universal. This seems obviously true. If so, then it seems that one could have a visual experience as of temporal passage, without having a visual experience as of absolute becoming. Experience might tell us that time passes, but it might be mute on whether anything undergoes absolute becoming.

I also do not think that the case about temporal passage is straightforwardly disanalogous to the causality case or the case involving holes. There is no reason why Siegel's argument should not hold in the case of temporal passage. Siegel's objection is that if one's experience represents that p , and p entails q , it does not follow that one's experience represents that q . In all three cases, the causality case, the holes case and the temporal passage case, that p entails q is supposed to be an analytical or conceptual truth that follows from the meaning of the terms (cf. Siegel 2009, p.539).¹²

There is however *some* disanalogy between my argument and the arguments Siegel is objecting to. Recall the Argument from Experience, AfE:

(AfE):

- (1) All of us constantly experience time passing.
- (2) The best explanation for these experiences is that time really does pass.
- (3) Therefore time passes.

¹² The example with the glass of water is different: that water is H_2O is not a conceptual or analytical truth, but an a posteriori necessity.

Siegel wants to show that we can represent causality in visual experience. Contrary to AfE, she does not talk about inferring from experience that there really are things that instantiate causal relations. She suggests that in the case of causality, if there are any phenomenal constraints on how causation must look like at all, then they must be very minimal. They are, she reckons, probably *too minimal to differentiate* causation from mere contiguity (cf. Siegel 2009, p.540). In contrast, my main target is to argue against AfE, the view that we can infer temporal passage from experience. Applied to temporal passage, Siegel's point is that there might be no or too minimal phenomenal constraints on how temporal passage must look like to differentiate passage from 'non-passage'. Such a generous approach does not suit the proponent of AfE. If one wants to argue from the experience of passage to the fact that time passes, then one has to accept at least one constraint: however passage is represented in experience, the experience must be *best explained* by the fact that time passes (premise 2). And something is only best explained by some fact F , if there aren't any better or equally good explanations than F at hand. That is to say, if the relevant experience is better or equally well explained by the fact that time does *not* pass (or, more generally, by a fact which is incompatible with the fact that time passes), then it is false that the fact that time passes is the *best* explanation for that experience. If the phenomenal constraints on what temporal passage must look like in experience were so minimal that they would not differentiate between passage and 'non-passage', then the second premise of AfE would be false and the conclusion would not follow. Analogously, suppose someone wanted to argue that there really is causation in the world on the grounds that we represent causation in experience. If Siegel is right, then we could not infer from experience that some things instantiate causal relations, even if we accurately represented causation in experience.

For AfE to work, temporal passage must be experientially represented such that the experience is *best explained* by the fact that time passes. I suggest that a necessary condition for the content of one's experience to be best explained by the fact that time passes is that the experience must be such that it could not be accurate if time did not pass. This, I claim, is the *phenomenal constraint* that the defender of AfE must accept. More generally,

(Constraint)

For an experience Ex to be best explained by the fact that p , it must be the case that Ex could not be accurate if not p .

(Constraint) is a *necessary* condition for (the content of) any experience to be best explained by the fact that time passes. For suppose temporal passage was visually represented in such a way that the experience could be accurate if time passes and if time does not pass. In that case, one's experience would be mute as to whether it is best explained by the fact that time passes or by the fact that time does not pass (or, more generally, by some fact that is incompatible with the fact that time passes). It would be false to say that the fact that time passes is the best explanation for one's experience, even if those experiences were accurate. Here is a different example: Suppose Lily sees her father *as* a man in a Santa Claus costume, crawling down the chimney. For that experience to be best explained by the fact that Lily's father crawls down the chimney, it must be the case that Lily's experience could not be accurate if Lily's father did not crawl down the chimney. However, Lily's experience could be accurate although her father does not crawl down the chimney, therefore her experience is not best explained by the fact that her father crawls down the chimney (and she could not infer that it is her father that she is seeing), although this might in fact be exactly what happens.

Note, though, that (Constraint) is *not a sufficient* condition: illusions or hallucinations of temporal passage might satisfy (Constraint) without being best explained by the fact that time passes. Suppose I wanted to argue from my visual experience as of red apples that there really are red apples. If (Constraint) was a sufficient condition, then my experience would be best explained by the fact that there are red apples if it could not be accurate in a world where all apples are green. But my illusion as of red apples could also not be accurate in a world of (only) green apples, although it is false that my illusion as of red apples would be best explained by the fact that there are red apples.¹³ Note also that AfE's premise one states that we *all constantly* experience temporal passage, but that this qualification does not change anything about the fact that (Constraint) is a necessary but not a sufficient condition. If one particular experience fails to meet constraint, then the fact that we all constantly have that type of experience still does not make it the case that that type of experience is best explained by the fact that time passes. On the other hand, if we all constantly had a type of experience that would satisfy (Constraint), (Constraint) would be stronger. That is to say, such an experience would be more plausibly best

¹³ This is even true in the case of *veridical hallucinations*, where, say, one's brain is tempered in such a way that one has a hallucination of a blue cup, while also being in a position from which one could see a blue cup if one's brain would not be tempered with. In these cases my hallucinatory experience would, *although coincidentally accurate*, not be best explained by the fact that there is a blue cup in front of me but by the fact that my brain has been tempered with.

explained by the fact that time passes than a token experience of this kind, for if we all constantly have this (type of) experience, it is less likely that we suffer from an illusion or hallucination. Still, even if we all had constantly a certain experience Ex, and Ex could not be accurate in a world where time does not pass, Ex might not be best explained by the fact that time passes. It is possible for all of us to constantly suffer from an illusion (or hallucination) that could not be accurate if time did not pass, without those illusions being best explained by the fact that time passes.¹⁴

In brief, any experience from which we want to infer that time passes must meet (Constraint). However, this does not suffice: the static theorist could still say that these experiences are illusory (or hallucinatory). The AfE defender assumes that an explanation that takes experiences to be veridical is generally a *better* explanation than one that resorts to illusions and hallucinations, especially if we are all supposed to constantly have these experiences. The standard Static theorist denies this in the case of temporal passage experience. Her position is considerably stronger though, if she does not rely on the view that our experience is consistently inaccurate. Thus the Static should better agree that judging an experience to be illusory (or hallucinatory) is, particularly in this case, a worse explanation than one that takes it to be veridical. The best strategy for the static is to determine what kind of experience would meet (Constraint), and then argue that we cannot have this kind of experience. This shall be the strategy I will pursue.

To sum up this far: I have argued that in order to be best explained by the fact that time passes, one's experience must be such that it could not be accurate if time did not pass (Constraint). (Constraint) would be met by experiences of absolute becoming, for if time did not pass, then it could not be accurate that events undergo absolute becoming (cf. chapter 5). The question that remains to be answered is whether there are any *other* experiences which would satisfy (Constraint). In the next two sections I will assess various alternative ways in which passage could be represented in experience.

¹⁴ Alternatively, suppose that the fact that time passes could not be separated from the fact that there are causal relations, so that if time passes, then there are causal relations. If time does not pass, then there is nothing that instantiates causal relations. It might then be that an experience Ex could not be accurate in a world where time does not pass, while not being best explained by the fact that time passes but by the fact that there are causal relations.

7.3 Temporal passage and ordinary change

Recall once more AfE, the Argument from Experience:

(AfE):

- (1) All of us constantly experience time passing.
- (2) The best explanation for these experiences is that time really does pass.
- (3) Therefore time passes.

In the last section I have argued that, for AfE to go through, temporal passage must be experientially represented in such a way that it is best explained by the fact that time passes. A necessary condition for this to be the case is that the experience could not be accurate if time did not pass (Constraint). An experience that would satisfy this criterion would be an experience as of events undergoing absolute becoming. The question is now whether there are *other* ways to represent passage in experience, which would also meet (Constraint). If so, then there are other ways in which (1) could be specified, so that (2) would still be true. In that case, even if we cannot experientially represent absolute becoming, AfE would still go through. For the remainder of the chapter, I will assess certain alternative ways to represent passage in experience. I will argue that only accurate experiences as of events undergoing absolute becoming are best explained by the fact that time passes. I will begin in this section by assessing the view that to experience passage is to experience 'ordinary change'.

We do not usually associate temporal passage with experiences of absolute becoming. One of the experiences with which we associate temporal passage much more commonly is the experience of *ordinary change*. Under 'ordinary change' I understand all changes, apart from those which are constituted by absolute becoming, or changes in terms of A-properties¹⁵. In this section I will argue that one cannot infer the fact that time passes from one's experience of ordinary change. Briefly put, my view is that to defend such a claim is to confuse temporal passage with duration.

¹⁵ I am not implying that all ordinary changes can be experienced. Mere Cambridge changes are presumably not perceivable and that they are included under the label 'ordinary change' might sound strange. However, the term 'ordinary change' is mainly chosen to separate changes that constitute temporal passage from those which do not.

It is a widely held belief that we experience temporal passage in experiencing ordinary change or motion.¹⁶ Here is how Le Poidevin puts it:

As for the passage of time, we are not only aware of this when we reflect on our memories of what has happened. We just *see* time passing in front of us, in the movement of a second hand around a clock, or the falling of sand through an hourglass, or indeed any motion or change at all. (Le Poidevin 2007, p.76)

The idea appears to be that we 'just see' passage in the moving of the clock's hand, because passage *looks like* ordinary change in visual experience. The intuitive support for this view seems to come from the thought that we *measure* how much time passes, when we observe the length of time that it takes for a change to occur. After all we say things like

'Two hours have passed since I put the roast in the oven, it is done now' or
'Time seems to pass very quickly when you are reading a gripping novel!'

Such a view is based on confusion though. Both statements do not refer to anything but the *duration* of time it takes for some change to occur. The first statement merely states that it took two hours for the roast to cook; the second statement states that the length of time it takes to read a novel appears shorter than it is, when it is a gripping story. There is nothing in these statements which refers uniquely to temporal passage and which is not applicable to mere duration without temporal passage. Although it might be true that experiences of ordinary change dispose us to believe that time passes, we do not experience temporal passage in experiencing ordinary change. Moreover, one cannot infer temporal passage from one's experience of ordinary change. To think otherwise, is to confuse passage with duration. Or so I shall argue.

To experience ordinary change is to experience a succession of qualitatively distinct events. Succession entails duration, but not temporal passage. Therefore one could have an accurate experience as of ordinary change, even if time did not pass. In other words, one could not infer

¹⁶ I shall treat motion as a kind of ordinary change and wont mention it specifically anymore. Le Poidevin does not defend the view that we experience temporal passage. He is merely describing an intuitive pre-philosophical assumption that most of us share.

that time passes from one's experiences as of ordinary change. To explain this, I will have to say a few words about the perceptual experience of time in general. We experience time when we experience change in objects, which is manifest in the fact that we measure durations of time by observing change.¹⁷ How does the experience of change relate to the experience of time? A change is always a change *in* objects, as well as a change *of* atomic events, where atomic events are property instantiations *at times* (cf. 1.3). (From here on just 'event'. I shall make it clear when I refer to temporally extended events.). Thus when we experience change, we thereby experience time.

Let me clarify. A change occurs, when some object *a* is *F* at t_1 and *G* at t_2 where *F* and *G* are incompatible properties. Such a change *in* some object is related to a change *of* atomic events: *a* changes from *F* at t_1 to *G* at t_2 , if and only if there is a change from event E_1 (*Fa* at t_1) to E_2 (*Ga* at t_2). Events are numerically distinct if they differ at least with respect to the time of the property instantiation. They are also qualitatively distinct if they differ with respect to their constitutive objects and/or properties instantiated.¹⁸ To experience a change in some object is equivalent to experiencing a succession of qualitatively distinct events. If a subject *S* experiences *a* changing from *F* to *G*, *S* experiences first E_1 (*Fa*) and then E_2 (*Ga*), where E_1 and E_2 are qualitatively distinct and occur at different times. In experiencing change, *S* experiences a *succession* of events. A succession *takes* time. It comes at no surprise then that one can infer *duration* from one's experiences of ordinary change, for there could not be change without duration. When we are aware of ordinary change, we are thereby aware of some *duration* during which the change occurs. When we see a traffic light changing from red to green, for example, we experientially represent that change as a succession of two events, an event 'light is green at t_1 ', followed by another event 'light is red at t_2 ', and we are thereby aware of the interval (t_1 - t_2) over which the change occurs. Experiencing change *entails* experiencing the duration over which the change occurs, just as experiencing some material object entails experiencing the region of space that is occupied by that very object.

¹⁷ See also Shoemaker for this point (1969). Shoemaker thinks that the fact that we measure time by observing change makes it plausible that there cannot be time without change, for to hold otherwise is to be sceptic about the possibility of measuring time at all. Whether or not there could be time without change shall not be my concern here.

¹⁸All qualitatively distinct events are also numerically distinct, although the converse does not necessarily hold.

I should mention that whether change should be analysed as occurring over an interval, or at a time, is a contentious matter. Standardly, change is taken to occur over time, but some people think that changes are instantaneous. Priest for example has developed an 'intrinsic account of change', where it is solely a matter of the intrinsic features of an object *at an instant* whether it is changing or not (2006). According to Priest, the traditional view of non-instantaneous change, where change is constituted by objects instantiating incompatible properties at different times, cannot account for change because there is no time at which the change occurs (cf. Mortensen 2011). However, even if Priest was right and change was instantaneous, it could not occur in a world without duration. Instantaneous changes are similar to boundaries in that they demarcate different events or state of affairs. Just like temporal boundaries, instantaneous changes would ontologically depend on what happens before and after them. If there is nothing that *changes*, that is, nothing that is different now from how it was before, there cannot be change. Therefore, even if change was instantaneous, it could not occur in a world without duration. Moreover, even if change was instantaneous, we would not *experience* it *as* instantaneous. When a traffic light changes from red to green, for example, we do not experience that the light is simultaneously red *and* green, we experience that the light is *first* red and *then* green, that is, we experience the change as occurring *over* time. We can thus ignore the view that change is instantaneous because, in experience, *a*'s change from *F* to *G* always takes time, whether or not there is a moment of change. Note however that this does not imply that our experiences would be illusory if Priest was correct. Even if one had an account of change as instantaneous, it would still be the case that if *a* changes from *F* to not *F* at t_2 , then there must be a preceding time t_1 , at or during which *a* is *F*, and a succeeding time t_3 , at or during which *a* is not *F*. Our experience could then correctly represent *a*'s change as occurring within the interval I (t_1 - t_3), and merely be silent on the particular instant of change within I .

Coming back to temporal passage, the fact that one can infer duration from one's veridical experience of ordinary change does not mean that one can infer passage from one's veridical experience of ordinary change. Experiencing ordinary change is to experience a succession of events, and experiencing succession entails experiencing duration. One could, however, perceive succession and duration even if time did not pass. Just as we (standardly) occupy various spatial perspectives during our lives, we occupy various temporal perspectives during the course of our lives. Throughout our lifetime we are aware of what happens at different times, *at different times* – that is to say, we are aware of *one time after another*. But our 'being aware of one time after another'

can be explained in a dynamic way as well as in a static way. Explained in a dynamic way, our being aware of one time after another is brought about by time “moving” or “passing by”, that is, by the fact that time passes. Explained in a static way, we “move” through time, changing our temporal perspectives, one by one, in a similar way as we are moving through static space, thereby changing our spatial perspectives.

Here is an analogy that might hopefully help to illustrate the distinction I have in mind. Imagine you are visiting some art exhibition and you are led into a dark room with a hole in the wall to look through. Looking through the hole, you can see an image projected on another wall. After a while the image disappears and is replaced by another one, which is replaced again after a few seconds. Ten images are presented to you in this way before the slide show is over and you are shown into another room. The second room is also dark, but instead of one hole in the wall opposite the door, there are ten holes, lined up in a row. A little note tells you to look into each of the holes, one by one, starting with the first one on the left. As you look into the holes, one by one, you can see the very same images that you have just seen in the slide show. There is no difference *in what you see* between the first room and the second room. In both rooms you see a succession of different images, one by one, only that in the first room you are still, and the images slide past you, where in the second room the images are still and you are changing your visual perspective, thereby seeing the different images. In any case, *just from what you have seen*, you cannot tell whether it is you that moves, or whether the images slide by.

This is of course a rather idealised scenario. But the idea should be clear enough. The difference between the slide show of images and the row of images is somewhat analogous to the difference between succession in a dynamic world, and succession in a static world. The analogy is certainly not absolutely perfect because it is misleading to speak about “our movement through time” in the same way as we speak about our movement through space. For the Static, “movement” through time just consists in our occupying various temporal perspectives, simply in virtue of existing at different times. It is a further question for the Static why we experience times in a continuous order, rather than, say, experiencing an event from 1984 followed immediately by an event from 2015. Or, to speak in the metaphor of the previous analogy, why we are looking through the holes in a specific order, rather than just randomly. Another question relates to the direction of temporal experience. Our experiences appear to “move” ever further into the future, but never into the other direction. But these questions are very likely to be

explained with other facts, presumably facts about causality and entropy, rather than by the fact that time passes.

Common to both cases is that we cannot distinguish between the two kinds of succession, *just by experiencing one thing after the next*. Thus the experience of ordinary change cannot tell us whether it is time itself that “moves” (as with the slide show) or whether we just see different things at different times (as with the row of images). I conclude that the idea that we can infer passage from experiences of ordinary change is based on a confusion between passage on the one hand, and succession and duration on the other. To experience ordinary change is to experience a succession of events, where experiencing succession entails experiencing duration. However, temporal passage is neither the same as, nor is it entailed by either succession or duration. In other words, experiences of ordinary change do not satisfy (Constraint), for it would be possible to have an accurate experience of ordinary change, if time did not pass.

In the next section I will argue that one cannot infer temporal passage from one’s experiences as of events as present.

7.4 Temporal passage and presentness

Some people think that experiencing temporal passage just is (read: *is nothing more than*) experiencing events as present.¹⁹ Roughly speaking, the idea is presumably that experiences as of events as present amount to experiences of temporal passage, because temporal passage consists in times being (successively) present. I argue that even if we could have experiences as of presentness, we could neither infer the right kind of presentness from these experiences, nor could we infer from those experiences that time passes. The section is structured as follows. I will first clarify three issues, one issue about the terminology involved and two others about the position I am arguing against. I shall then give four arguments against the view that we can infer passage from experiences as of presentness:

7.4.1. The argument against visibility

¹⁹ Le Poidevin mentions this view (Le Poidevin 2007, p.77), but it is also discussed among others by Mellor (1981, 1998), Callender (2008) and Prosser (2007).

7.4.2. The argument against vividness*

7.4.3. The argument against tensed perceptual content

7.4.4. The argument against entailment

The first argument says that presentness is not a visible phenomenal property, for there is no property it can be contrasted with in visual experience. The second argument replies to an objection to the first argument. I argue that if presentness was experientially represented as a kind of vividness, then these experiences would not be best explained by the fact that some things are really present in the relevant, that is, A-theoretic sense. If nothing is present in the A-theoretic sense, the argument fails, for then one cannot argue from A-presentness to temporal passage. The last argument says that even if we had experiences that were best explained by the fact that some things are present in the relevant sense, that fact does not entail that time passes. Therefore we could not infer that time passes from experiences as of events as present.

Before I begin, a few issues have to be clarified, one about terminology, one about temporal perception, and one about metaphysical coherence. Concerning the terminology, it will be especially important to keep the distinction between the A-theoretic notion of presentness and the B-theoretic notion of presentness in mind (cf. 1.2). For A-theorists, presentness is an objective (that is mind-independent), intrinsic property. For B-theorists, presentness is an indexical notion analogous to the spatial indexical 'here'. Contrary to A-theoretic presentness, B-theoretic presentness is perspective dependent: to predicate presentness of something is to predicate a relation of simultaneity between that thing and something else: a date, a speaker, an event. To avoid misunderstandings, I shall call the A-theoretic notion of presentness '*A-presentness*' or '*A-present*'. The terms '*B-presentness*' or '*B-present*' are used for the B-theoretic notion of presentness and I shall just say present or presentness when I want to stay neutral between these notions.

Secondly, I have argued in the first part of this thesis that temporal passage should not be understood as change in terms of A-properties but as absolute becoming of times. Presentism, the view that can best accommodate absolute becoming, does not standardly hold that times instantiate presentness properties. For most presentists to be present is just to exist (cf. chapter 5.4). This appears to be in tension with the claim that experiencing passage is experiencing events as A-present, at least if the experiences are supposed to be veridical, for this would

require events to instantiate presentness properties. The two claims are not necessarily incompatible though. Somebody who wanted to reconcile them could hold that times that come into existence thereby acquire presentness (and lose that property once they cease to exist).²⁰

Thirdly, I have introduced the view under discussion as the view that to experience temporal passage is to experience events as A-present. More precisely it should be stated as the view that to experience temporal passage is to experience a *succession* of events as *successively* A-present. It would be incoherent to hold that to visually represent temporal passage is to visually represent a single event being present. For time to pass, there needs to be a *change* of what is present, and no change could be experientially represented at a single time (cf. 7.3). One might then ask how it is possible to represent *successive* events in a *single* perceptual experience. Given that it is standardly assumed that we are not perceptually aware of what is past or what is future, and that the A-present is supposed to be instantaneous, it seems that we cannot be perceptually aware of a *succession* of A-present times, for that would require being aware of *more than one time* (more than what is presently present) within a single experience.²¹ Note that the Dynamist could not help herself by saying that we only ever experience the time that is now present, but *infer* a succession of present times by remembering times that have been present before. As James pointed out, 'a succession of experiences is not an experience of succession' (1890, p.227). The Argument from Experience, AfE, appeals to perceptual experience only, and this is where the defenders of AfE see its unique appeal. If the first premise of AfE would be that we *infer* temporal passage, rather than experience it, then the inference to the best explanation would not work anymore (cf. chapter 6.5). Some theories of temporal perception, *specious present theories*, allow for experiences that represent more than what occurs at a single time.²² Thus if a defender of AfE wanted to argue that to experience temporal passage *is the same as* to experience events as A-present, then she would have to accept some form of specious present theory.

²⁰ For presentists that reduce presentness to existence see among others Prior (1968b), Craig (1998), Crisp (2005), Bourne (2006a) and Tallant (forthcoming). That it is nevertheless not obligatory for presentists to reject presentness properties is acknowledged for example by Percival (2002, p.99) and Fine (2005, p.285).

²¹ More precisely, we do not experience what is present but what was *recently* present, that is, what is past for as much time as the information we experience takes to reach us. We do not experience anything that is *more* past than what was present before the time lag.

²² Specious present theories (of different types) have been among others defended by James (1890), Broad (1938), Foster (1982), Dainton (2000) and Tye (2003).

It is for now better to set such complications aside (I come back to this in chapter eight). Instead, I shall assume that we cannot have perceptual experiences that represent (what happens at) more than one time.²³ The argument I am opposing to is not that experiences of temporal passage just are experiences of events as Λ -present, but that we can infer temporal passage from experiences as of events as Λ -present. I call it the *Argument from Presentness (AfP)*:

(AfP) (1)

- I. We have experiences as of events as Λ -present.
- II. The best explanation for these experiences is that some things are Λ -present.
- III. (from I and II): Therefore some things are Λ -present.
- IV. Some things are Λ -present, only if time passes.
- V. (from III and IV): Therefore time passes.

AfP is the view that one can infer from experience that some things are Λ -present, and that Λ -presentness entails temporal passage. For the rest of this section, I shall argue against AfP. I will present four arguments against AfP. The first argument says that Λ -presentness is not a visible property.

7.4.1 The argument against visibility

Suppose that on a clear night you are out with a telescope to look at the stars. With you is a friend who knows a lot about stars. He is pointing the telescope towards the sky and tells you to look into it. You see two stars. ‘The one on the left does not exist anymore’ your friend explains, ‘it is only because it is so far away and the light takes so long to reach us, that we still see it’. You are amazed because it looks just like the other star. It seems as though you see both stars *as* Λ -present, although you know that one of them does not exist anymore.²⁴

One mistaken conclusion that someone might draw from this is that since past events appear through the telescope in the same way as present events, nothing looks like it has presentness. This is the view that Skow (unfairly, I think) ascribes to Hestevold:

²³ In chapter eight I give an argument against AfE assuming that we can experientially represent more than one time.

²⁴ A similar example is found in Mellor (1998), Le Poidevin (2007) and Hestevold (1990).

Hestevold concludes: “since past events [or past things] appear through the telescope to an observer in the same way that present events [or things] appear to the observer,” nothing looks like it has presentness. (Skow 2011, p. 370)²⁵

I agree with Skow that this is not a good argument. The fact that one seems to see both stars as Λ -present, although one of them does not exist anymore, does not show that neither of them looks Λ -present. It could be that *both* stars are visually represented as Λ -present, but that (at least) one of the experiences is illusory. If you seem to see two red apples, although one of them is actually green, it does not follow that neither of them looks red. It rather shows that you experience both apples as red, and that in one case your experience is mistaken (cf. Skow 2011). It would be unfair to interpret the example in this way though. What it means to show is that *everything*, even things that are so far past that they do not exist anymore, is represented as Λ -present in experience. We do not have visual experiences as of past or future events *as* past or *as* future. Even if what is seen is actually past, we see it *as* Λ -present.²⁶ There does not seem to be anything in the visual properties of a photograph, say, that shows us that the depicted scene is past. In fact, due to the time lag in perceptual experience, everything that we see is past. But we still seem to see it as Λ -present and not as past. As Mellor puts it,

[o]ur reasons for thinking we cannot see the future [or the past] rest not on observation but on theory. (1998, p.16)

In other words, we cannot contrast Λ -presentness from anything else in visual experience.²⁷ But if everything is experienced as Λ -present, then it is hard to get a grip on what something has to look like in order to look Λ -present. An analogy might help. We can understand what green looks like by looking at two different green objects, say a cloverleaf and a grasshopper. Although the objects are very different, they are also similar in one salient respect — they are both green (cf. Skow 2011, p.366). If everything looked green, then it would be hard to grasp the respect in which those objects are similar. The idea behind this is that phenomenal properties, properties

²⁵ Skow refers to Hestevold (1990).

²⁶ A similar point could be made about future events. If we were able to see the future, we would still represent it *as* present. Mellor has an example of this sort involving a magic crystal ball. Whatever future scene is presented to you in the magic ball, it still *looks* present to you. But we could not conclude from this that it *is* present (Mellor 1998, p.16).

²⁷ Le Poidevin makes a similar point (2007, p.78).

that are represented in experience, have a discriminatory function. We learn what it means to look in a certain way, by distinguishing objects on the basis of their visual differences. In other words, to understand what green looks like, one has to learn what green does *not* look like. An analogous point could be made about A-presentness: to understand what A-presentness looks like, one needs to understand how A-presentness does not look like. But if I experience everything as A-present, then I cannot know what A-presentness looks like, for I cannot know what A-presentness does not look like.²⁸ If we cannot contrast experiences as of A-presentness from experiences as of pastness or futurity, then experiencing something as A-present just seems to boil down to experiencing something *fullstop*. Le Poidevin agrees:

To perceive something as [A-]present is simply to perceive it: we do not need to postulate some extra item in our experience that is 'the experience of [A-]presentness.' (Le Poidevin 2011b)

Here is another way to put it. If two experiences seem qualitatively the same to you, even though they are supposed to be different with respect to some property F, then it is safe to assume that we do not represent F in experience. If you want to know whether you can see a certain colour or not, then you make a test by looking at some spectrum that includes the colour and another spectrum which doesn't include it. If you fail to notice the difference, then it is safe to assume that you cannot represent that particular colour in experience.

That said, somebody might argue that we can contrast experiences as of A-presentness from memory experiences as of past events or from imaginings as of future ones.²⁹ Whatever quality is phenomenally present in perceptual experience but not in memory or imaginings, is how A-presentness is represented in perceptual experience. I will come to that objection in the next subsection.

7.4.2 The argument against vividness*

Against the view that A-presentness is not visible because it cannot be phenomenally contrasted from anything, one might raise the following objection. It is not true that we cannot contrast experiences as of A-presentness from anything. Memory experiences represent things as past.

²⁸ See also Hestevold (Hestevold 1990, p.542) and Le Poidevin (2007) on the same point.

²⁹ Professor Macpherson brought this point to my attention.

Imaginative experiences can represent things as future. Just because we *perceptually* represent everything as A-present, it does not follow that we cannot know what it is for something to look A-present. We can contrast the way things look in perceptual experience from the way things look in our memories or future orientated imaginings.

If this objection is supposed to be successful, my opponent has to show me first that the phenomenal difference between my visual experiences and my memories or my imaginings about the future is due to the fact that my perceptual experiences represent A-presentness, whereas my memories and my imaginings don't. If A-presentness is represented in visual experience, then it should be *visible* (cf. Skow 2011, p.369). Suppose at time t_1 you are looking at a green tomato and at time t_2 you are looking at a red tomato and you remember looking at a green tomato. Now, if A-presentness was a phenomenal property, then you should be able to *see* that the tomato is red, round and A-present, whereas in your memory, you should represent a tomato that is green and round, but is lacking the quality of A-presentness. However, I am not aware of such a quality represented in visual experience. A-presentness does not seem to be some additional visible feature that distinguishes the perceived tomato from the remembered one. A-presentness, it seems, is not a phenomenal property.

This is too quick, my opponent might complain. There is after all *some* phenomenal difference between one's visual perceptual experiences and one's pictorial representations of the past in memory (or respectively one's imaginings of the future). Perceptual experiences seem to have a special lucidity or vividness about them that memories or imaginings lack. Maybe we represent A-presentness as a kind of vividness in perceptual experience. Maybe this is the way A-presentness looks — it makes whatever is experientially represented vivid. We have seen before that there are only minimal phenomenal constraints on how things must be represented in visual experience (cf. 7.2). So why not allow that A-presentness is visually represented as a kind of vividness? Let us grant for the sake of the argument that A-presentness is visually represented as a kind of vividness in experience. Let us also grant that the kind of vividness that represents A-presentness in experience is a unique kind of vividness that all and only present experiences have. I shall call it vividness*. The idea then is that whatever is perceptually experienced as A-present, is represented as looking vivid*. Only present perceptual experiences, but not memories or imaginings *look* A-present, by virtue of looking vivid*.

To show why this suggestion won't help the Dynamist who defends AfP (the Argument from Presentness), I will have to appeal to the overall structure of the argument. The first premise of AfP says that we have experiences as of events as Λ -present. If Λ -presentness looks like vividness* in experience, we can change the first premise such that we have experiences as of events as vivid*. To get from that premise to the conclusion that time passes, one needs to argue from the experience of vividness* to the conclusion that some things are Λ -present. From the claim that some things are Λ -present, a further argument is needed to show that Λ -presentness entails temporal passage.

The Argument from Presentness (AfP) (2)

- I. We have visual experiences as of events as vivid*.
- II. The best explanation for these experiences is that some things are Λ -present.
- III. (from I and II): Therefore some things are Λ -present.
- IV. Some things are Λ -present only if time passes.
- V. (from III and IV): Therefore time passes.

(I) is the position that is assumed. I will assume the truth of (IV) for now and will come back to it in (7.4.4). Note that (I)-(III) is an argument analogous to AfE, the Argument from Experience. Let us call the partial argument from (I) to (III) *AfE**:

(AfE*)

- I. We have visual experiences as of events as vivid*.
- II. The best explanation for these experiences is that some things are Λ -present.
- III. Therefore some things are Λ -present.

AfE* argues that some things are Λ -present, because it is the best explanation for our experiences as of vivid* things. Recall the original AfE:

(AfE):

- (1) All of us constantly experience time passing.
- (2) The best explanation for these experiences is that time really does pass.
- (3) Therefore time passes.

I have argued that the structure of AfE poses a phenomenal constraint on the experience of temporal passage. However passage is experientially represented, the experiential content must be best explained by the fact that time passes. If AfE* is to succeed, it must satisfy the same phenomenal constraint. However Λ -presentness is experientially represented, the experience must be best explained by the fact that something instantiates Λ -presentness. A necessary (though not sufficient) condition for this to be the case, I said, is (Constraint):

(Constraint)

For an experience Ex to be best explained by the fact that p, it must be the case that Ex could not be accurate if not p.

According to (I), Λ -presentness is represented as vividness* in visual experience. Applying (Constraint), the question is: Could anything be accurately represented to look vivid* even if there were no Λ -presentness properties? There is *no prima facie reason* why this could not be the case. One's visual experience of some event E as vivid* could be accurate if E was *B-present*. An event is B-present when it occurs at the same time as one's experience of it. That is, a subject S might accurately experience an event as vivid*, when it occurs at the same time as S's experience of it.³⁰ If so, then we can give a competing explanation to the Dynamist's:³¹

(AfE**):

- (1) We have visual experiences as of events as vivid*.
- (2) The best explanation for these experiences is that some events are B-present.
- (3) Therefore some events are B-present.

The alternative explanation offered is that a subject S experiences some events as vivid*, because some events are B-present, that is, *occur at the same time as S's experience of it* and B-presentness looks like vividness* in experience. Dynamists could still argue that this is a *worse* explanation

³⁰ Strictly speaking, these experiences would be illusory, due to the time lag in experience. According to Butterfield though, we can almost always ignore the temporal delay. If the process of observation is reliable, and the object is not (much) more than 1000 meters away, we can learn about the observed object's state *at the time when we judge it*, not only at a previous time. This is not only due to the fact that the time lag is very short (Butterfield suggests 'half a second') but also because 'solid objects' change very infrequently. Butterfield admits that smell is an exception (1984, p.163 pp.)

³¹ Note that the analogous move is not open to the Static in the case of the original argument AfE: That time does not pass cannot be the best explanation for one's experience as of events undergoing absolute becoming for if time did not pass, there could not be absolute becoming (cf. chapter 5).

than the explanation that some things are A-present. But it is hard to see how without her begging the question. In other words, the Dynamist fails to argue for the existence of A-present things from experiences as of vividness*. If nothing is A-present, then (AfP) fails as well, because if there are no A-present things, then there is nothing that entails that time passes. I conclude that, even if A-presentness was represented in visual experience as vividness*, we could not infer from these experiences that time passes. Next, I shall discuss a very different way in which one could be said to represent A-presentness in experience.

7.4.3 The argument against tensed perceptual content

There might be still another way to represent A-presentness in experience. Some people think that to represent A-presentness in experience is just to have experiences with perceptual contents that are best expressed by tensed propositions, as in 'I see that the rhino is (A-presently) yawning'. To this I will only say that it is a very contested point whether or not perceptual contents are tensed or not.³² I will, however, not go further into the debate because there is a more important argument to be made. It is one thing for perceptual content to be best expressed by a tensed proposition, and another thing for that proposition to have tensed truthmakers, as we have seen in the semantic tensor-detensor debate (cf. chapter 1.4). Just as the B-theorist can deny that tensed propositions have tensed truthmakers, she can deny that perceptual contents expressed by tensed propositions have tensed accuracy conditions. Thus, the B-theorist could say that if I see that the rhino is (A-presently) yawning, my experience is accurate, if and only if the rhino yawns at the same time as I am seeing it. She could thereby argue that the tensed form of the perceptual content merely represents that the event experienced occurs simultaneous with one's experience of it. In other words, to have a veridical experience with a content that is best expressed by a tensed proposition, does not imply that one perceives A-presentness or that time passes.³³

All the arguments discussed up to this point either deny that one can visually represent A-presentness or that one's experiences would be best explained by the fact that some things are A-

³² Hoerl (2009), Oaklander (2007) and Russell (1915) are among those which have explicitly denied that perceptual experiences should be described as having tensed content.

³³ Of course, this reply is only open to Statics, which are also B-theorists, for the static A-theorist won't want to deny that there are tensed facts in reality.

present. The last argument against AfP says that the fact that some things are A-present does not entail the fact that time passes.

7.4.4 The argument against entailment

The fourth and last objection focuses on the third premise of AfP:

(III) Some things are A-present, only if time passes.

Premise (III) is false because there could be a time that is A-present, even though time does not pass. In such a scenario, time would be 'frozen' to a single (set of simultaneous) event(s) that is *always* A-present. Although it would be very strange if the world would be like that, there is no metaphysical or logical obstacle for this being the case.³⁴ As Fine puts it,

Even if presentness is allowed to shed its light upon the world there is nothing in [this] metaphysics to prevent that light from being 'frozen' on a particular moment of time. (Fine 2005).

In other words, it is possible for a world to be such that there is one time that is always A-present.³⁵ If that is so, then the claim that some things are A-present only if time passes is false. It follows that even if we did represent A-presentness in experience, and even if those experiences were best explained by the fact that some things are A-present, we could not conclude from the fact that some things are A-present that time passes because A-presentness does not entail that time passes.

³⁴ One unsettling consequence of this view might be that, if the A-present was frozen to a single time, then we could not know whether we live in the A-present or not. This consequence has been for example discussed by Braddon-Mitchell in the context of the growing block view (2004). A similar argument can be found in Bourne (2002). There, the idea was that if the growing block theory was true, that is, if only the present and the past existed, with the present ever "moving forward", then we had no means to find out whether our time was the (A-) present, the "growing edge" of the block, or a past time. As a reply it has been said that consciousness requires A-presentness, thus, even on a growing block view, we can always be guaranteed to live in the present (Forrest 2004). Applied to the frozen present view, one might think that this would mean that we would all be instantaneous creatures, which is clearly a very problematic view to hold. A discussion of these matters would lead us too far though. Important here is merely that the frozen time view is logically and metaphysically coherent. Whether or not it should be rejected on different grounds shall not be my debate now.

³⁵ On Fine's proposed 'non-standard tense realism' there could even be a multitude of A-present times without time passing. I have not the space to discuss Fine's view here though.

I have discussed three different ways in which A-presentness could be represented in visual experience, as “visible A-presentness”, as vividness* and as tensed propositional content. None of these options would work for the defender of the Argument from Presentness, AfP, because either the property in question is not visible or because we could not argue from these experiences to the fact that there really is A-presentness and therefore not to the fact that time passes. I finally said that even if we had experiences that were best explained by the fact that some things are A-present, A-presentness does not entail temporal passage. I conclude that we cannot infer from experiences as of A-presentness that time passes.

In the last section of this chapter I will argue that experiences as of events undergoing absolute becoming are the only experiences that, if veridical, would be best explained by the fact that time passes.

7.5 The experience of absolute becoming

If one wants to infer that time passes from one’s experience Ex, Ex must satisfy the following phenomenal constraint: Ex must be such that it could not be accurate if time did not pass (Constraint). Apart from experiences of absolute becoming, I have discussed several other candidate experiences, each of which, I argued, were unsuccessful. There might of course still be further candidates. It is hard to see though which other experience could meet (Constraint). On the face of it, a static world should contain all the physical facts that a dynamic world contains, apart from the fact that time passes (although the dynamic presentist (or growing block) world would comprise less facts than the static one).³⁶ But if absolute becoming is the *only* thing that distinguishes the events in a dynamic world from the events in a static world, then it is hard to see how any other experience, apart from the experience as of absolute becoming, could *only* be accurate in a dynamic world. The conclusion of this chapter is that the only experiences that would be best explained by temporal passage would be veridical experiences as of events undergoing absolute becoming.

³⁶ Differently put, apart from the fact that time passes all the facts of the dynamic world could be mapped on to the facts of the static world. Prosser (forthcoming, p.3) and Price (1997, p.14-5) have argued before me that the facts constituting a dynamic world could be mapped ‘one-to-one’ to a static world. The dynamic world, however, contains *less* facts than the static world, for if time passes then only present things (and maybe also past things) exist. Prosser and Price do not mention that the dynamic world contains less physical facts than the static world, presumably because they have an A-eternalist dynamic theory in mind, rather than presentism.

In this chapter I have argued that the defender of AfE must understand experiences of temporal passage as experiences of events undergoing absolute becoming. I have first shown that differences between substantivalist and relationist accounts of time do not make a difference for how passage would be perceived. I then acknowledged that there might be more than one way to represent passage in visual experience. However, for AfE to work, there is one necessary condition that any experience must meet in order to be best explained by the fact that time passes: it must be such that it could not be accurate if time did not pass. For the rest of the chapter I have argued that only experiences as of events undergoing absolute becoming would meet this condition. In particular, I have argued against two kinds of experiences that are commonly thought of as experiences of temporal passage: experiences of ordinary change and experiences (as) of A-presentness. From experiences of ordinary change one can only infer duration, but not passage. In the case of A-presentness, I have argued that we either cannot visually represent A-presentness, or only in such a way that we cannot infer passage from it. Finally I have argued that the only thing that differentiates a dynamic from a static world is absolute becoming. Therefore, there could not be any experience, apart from the experience of absolute becoming, that could only be accurate in a dynamic world. I concluded, that only veridical experiences as of events undergoing absolute becoming meet the condition to be best explained by the fact that time passes.

The opponent of AfE could now either argue that our experiences as of absolute becoming are illusory or that we cannot visually represent absolute becoming. I said in chapter six (6.5) that the former strategy is not a very good strategy against AfE. It only forces the opponent of AfE to explain why and how we all suffer from this illusion.

The task of the next chapter is to show that we cannot have visual experiences as of events undergoing absolute becoming.

Chapter Eight

Experiencing Temporal Passage

In the last chapter I argued that the only experience that would be best explained by the fact that time passes would be an (accurate) experience as of events undergoing absolute becoming. All other ways in which one could be said to experience temporal passage are not best explained by the fact that time passes. Taking this into account, AfE should be understood as follows:

(AfE) (2)

- (1) All of us constantly experience events undergoing absolute becoming.
- (2) The best explanation for these experiences is that time passes.
- (3) Therefore time passes.

The static theorist has two options to object to (AfE 2). She can say that our experiences as of absolute becoming are illusory. She thereby rejects (2), so that the conclusion does not follow. Or she can reject (1) and deny that we have experiences as of absolute becoming. I have argued earlier (see chapter 6.5, p.144 pp.) that the first strategy is inferior to the second one, as it pushes the opponent of AfE into a defensive corner from where she must give a long plausible story as to why and how we generate these illusions. My strategy is thus to reject premise (1). The aim of this chapter is to argue that we cannot visually represent events undergoing absolute becoming, at least not in such a way that we could infer that time passes from that experience.

Absolute becoming, as I have explained in chapter five, is a kind of change, a change of what exists. In order to evaluate whether or not we experience absolute becoming, we need to look at the claim in the light of various theories of change perception, or, more generally put, temporal perception. The rest of this chapter is divided into six sections. The first section introduces the debate about temporal perception and the problem of explaining experiences of change in general. In the second section I introduce memory based accounts of temporal perception. I argue that we could not have experiences of absolute becoming given a memory theory, for memory theories deny that we can have perceptual experiences of change in general. Section three introduces accounts that defend the idea that we can perceptually experience change. There are two major types of these theories: retentional theories and extensional

theories. I argue that neither one allows for experiences of absolute becoming in such a way that we could infer temporal passage from them. In the last section I consider an objection, based on the view that we could visually represent temporal passage in a non-sensorial ‘phenomenally present as absent’ sort of way. I argue that any such experience would not be best explained by the fact that time passes. I conclude that we cannot infer from perceptual experience that time passes.

8.1 The problem of temporal experience

Initially, it might not be obvious what the problem and controversy about the experience of change is. We appear to be no less acquainted with the temporal structure of the world than we are with its spatial structure. We seem to constantly experience change, movement, and duration. From my balcony I can see the river passing by. I see the traffic moving through the streets, traffic lights changing their colour. I can hear when the music stops to play, smell when the toast starts to burn. I can feel rain drops running down my face and taste the burning of the chili long after I have eaten it. As Foster puts it,

[...] duration and change through time seem to be presented to us with the same phenomenal immediacy as homogeneity and variation of colour through space. (Foster 1982)

Intuitively, we seem to experience change and duration just as evidently as we seem to experience colours or shapes. But while our awareness of temporal phenomena seems obvious, the analysis of temporal experience encounters an intricate problem. The problem is that temporal phenomena such as change and duration take time, while our perceptual experiences seem confined to the momentary present.

In the literature about temporal perception, we often find the problem stated in terms of *direct* or *immediate* perceptual experience: change and duration take time, whereas we can only directly or immediately experience what occurs now. However, the use of ‘direct’ or ‘immediate’ in the context of temporal experience is misleading, for these terms are already used in the general philosophy of perception literature, where they are understood in a very different way. In the philosophy of perception (in contrast to the philosophy of temporal perception), the notion of ‘direct’ or ‘immediate perceptual experience’ is often understood to be such that a subject *S*

directly (immediately) perceives *o* at some time *t*, if and only if *o* is not indirectly (mediately) perceived by *S* at *t*, where *S* indirectly perceives *o*, when *S* perceives *o* in virtue of perceiving something else.¹ For the purposes of clarity, let us call direct experiences in the general perception sense *direct_G* experiences. Naïve realists for example think that all perception is *direct_G*, whereas sense-data theorists think that we only indirectly_G perceive the world by virtue of directly_G perceiving sense-data. It is not entirely clear where representationalism stands in this debate. Although many representationalists would want to insist that perception is *direct_G*, some argue that representationalism cannot account for genuinely *direct_G* experiences because, given the representationalist theory, we would only be indirectly_G aware of the world by virtue of being directly_G aware of representational contents. Either way, the distinction between *direct_G* and *indirect_G* perceptions is not the relevant one for the temporal discussion at hand. If one thinks that perception is *direct_G*, and that we perceive change, then the perception of change will also be *direct_G*. On the other hand, if one thinks that perception is *indirect_G*, and that we perceive change, then the perception of change will be *indirect_G*, just as all other perceptions. The notion of direct experience that is of interest in the context of temporal experience is different from *direct_G* or *indirect_G* experience. For suppose I would be aware of change by virtue of experiencing *Fa* and remembering not *Fa*. It would be wrong to say that I indirectly_G perceive change, that is, it would be wrong to say that I perceive change by virtue of perceiving something else. If I am aware of change by virtue of perceiving some static state of affairs and remembering a previous static state of affairs, then I do not perceive change *at all*. In contrast, for a subject *S* to have a ‘direct’ perceptual experience of change, in the sense intended by the philosophy of temporal experience debate, is for *S* to perceptually experience change, rather than infer, judge, imagine or remember (that there is) change.

One might for example think that to experience change, as for example the change of a chameleon from green to yellow, is to see that the chameleon is yellow, *remember* that it was green and thereby be aware of the chameleon’s change — but in that case one would not perceptually experience the change of the chameleon. One would *infer* that the chameleon has changed from

¹ Although the notions of ‘direct’ and ‘immediate perception’ are often used interchangeably in the philosophy of (general) perception, Bermudez (2000) has convincingly argued that the meanings can come apart. According to him, to say that a subject *S* directly perceives an object *o* at some time *t* is to say that *S* is perceptually acquainted with *o* in a way that allows *S* to demonstratively refer to *o* at *t*, whereas to immediately perceive an object *o* is not to perceive it by virtue of perceiving something else.

memory and experience. Or one might think that to experience change is to be in a composite mental state constituted by a perceptual experience with the content ‘the chameleon is yellow’ and a memory state with the content ‘the chameleon was green’, where the combination of both results in an experience of change (I come back to memory based accounts in 8.2). Alternatively one might think that one could judge that the chameleon was green, while perceiving that it is yellow or imagine that it was green, while perceiving that it is yellow, where in both cases the combination of the imaginative state, or the judgement with the perceptual state would result in an experience of change. These kind of more “loosely understood” experiences are not at issue here. Nobody doubts that we are in *some* way aware of (ordinary) change.² The dispute in the debate about temporal perception is whether one can be aware of change *solely by virtue of one’s current perceptual experience*. What temporal experience philosophers refer to when they talk about immediate or direct perceptual experiences of change, is this notion of ‘pure’ perceptual experience of change, rather than the notion of direct (or immediate) experience as it is standardly understood in the philosophy of perception. I will therefore refrain from using ‘direct experience’ or ‘immediate experience’ and instead just say perceptual experience of change, or, if necessary, stress the just mentioned point by saying *purely perceptual experience*.

That we are talking about purely perceptual experience is particularly relevant with regards to the Argument from Experience (AFE) and the question whether we experience the change that constitutes temporal passage, absolute becoming. Recall the first premise of AFE (2):

- (1) All of us constantly experience events undergoing absolute becoming.

For AFE to go through, the term ‘experience’ in the first premise must refer to purely perceptual experiences. Suppose my experience of absolute becoming would be a composite of my perceptual experience that *p* and my imagining that *q*. In that case, my experience of absolute becoming would not be best explained by the fact that there is absolute becoming. It would be best explained by the fact that *p* and my imagining that *q* and the fact that I am aware of the (contents of the) two states together. Similarly, when I judge from my perceptual experience that *p* and my imagining that *q* that absolute becoming has occurred, this would not be best

² By ‘ordinary change’ I mean all changes apart from Genuine Change and absolute becoming.

explained by the fact that time passes but by p, q and my inference from p and q to the fact that there is absolute becoming.

Therefore what is of interest for AfE, and the debate about temporal experience in general, is the question whether or not we can purely perceptually experience (ordinary) change and absolute becoming, rather than infer, judge, imagine or remember (that there is) change. For the moment I shall focus on the debate about temporal experience in general. I shall come back to the experience of absolute becoming later.

To come back to where we started from, when I say that our perceptual experiences seem constrained to the momentary present, what I mean is that what we are aware of *solely by virtue of our current perceptual experience* seems to be constrained to the momentary present. If we can only be perceptually aware of what is (more or less here and) now, at the present moment, then we cannot be perceptually aware of change or duration (or any other temporally extended structure).³

There is one more qualification I need to make. Strictly speaking it is not true that we only perceive what is momentarily present. In fact, all we ever perceive is the past, due to the time lag in perceptual experience.⁴ The point is, however, that we only ever perceive *a* present (rather than *the* present) — we perceive what *was* present at the time when the light was emitted from the object we are currently perceiving, but we do not perceive *more* than what was *then* present. Our awareness, it seems, is restricted to what happens *at* a time, and cannot ‘take in’ what occurs *over* time. That is to say, it is natural to assume that when a perceptual stimulus takes *n* seconds to reach us at a time *t*, then we are perceptually aware of what happens at time *t-n*, but not of anything that happened before or after *t-n*. The initial problem thus persists: if we are only ever perceptually aware of what was momentarily present, and change and duration are temporally extended phenomena, then we cannot be perceptually aware of change (or any other temporally

³ Given that the question I am focussing on is whether we can experience absolute becoming, which is a form of change, I will most of the time only mention change. That said, the problems of temporal perception apply to all temporally extended phenomena, that is, to succession and duration as well.

⁴ Somebody who thinks that we perceive sense-data might deny this, but I am talking about perceptions of the external world. One might also think that one has current awareness of one’s present mental states without time lag. Given that the time lag plays no further role in my argument though, this is not of importance here.

extended phenomena).⁵ In other words, if our perceptual awareness is confined to the (or a) present, it must lack any temporal depth. If it lacks temporal depth, then it is impossible for us to perceptually experience change.

At this point we have reached a stalemate of intuitions. On the one hand, it seems to us that we perceive change and duration just as we perceive colours and shapes, on the other hand, it seems to us that we cannot be perceptually aware of more than what is momentarily present. In brief, we are confronted with what some people have called the *paradox of temporal awareness*:

It seems that, in order to experience any temporally extended phenomena our experiential awareness must extend over time, but it seems that it can’t. (Dainton 2010)

Here is how Zahavi puts the problem:

Pre-theoretically we all assume that we have direct experiences of change and persistence. We can hear an enduring tone or a melody, just as we can see a stationary pyramid or the flight of a bird. However, if I at any given moment were only aware of what was perceptually present then and there, how could I then ever perceive- in contradiction to remember, imagine or judge about- temporally extended objects? (Zahavi 2007)

The paradox of temporal perception appears to consist in the incompatibility of three plausible claims:

Assumption 1 (A1)

We seem to perceive change just as ‘purely’ as we perceive colours and shapes.

Assumption 2 (A2)

It seems that our purely perceptual experience is bound to the present moment.

Assumption 3 (A3)

We experience change as occurring over time.

⁵ For ease of reading I shall stick with the less precise formulation that we are only ever perceptually aware of what *is* present.

The three claims are incompatible: if change can only be experienced as something that occurs over time, and our purely perceptual experience is bound to a present moment, then we cannot purely perceptually experience change. Of the three claims, (A3) is the safest to hold. As I have argued before (cf. 7.3), even if change is instantaneous, we must experience it as occurring over time, for otherwise to experience change would mean to experience an object being F and not F at the same time. This would be problematic for two reasons. Firstly because in order to experience change, we would have to experientially represent a contradiction. Not only do we not experience such contradictions, it is even questionable if we *can* experientially represent contradictions at all.⁶ Secondly, an experience of some object being F and not F at the same time would not amount to an experience of change *as* change. To experience change as change, we need to experience something *changing*. We need to experience some object being first F and then not F, even if there was, in fact, a particular moment of change. This leaves us with (A1) and (A2). The temporal perception theorist has a problematic choice to make: either he abandons the idea that we can perceptually experience change or he denies that our perceptual experience is bound to a momentary present. The problem might be best illustrated by an example. Consider the following case:

Case 1:

A subject S has an auditory experience of a tune, constituted by the hearing of three successive tones C-D-E, C at t_1 , D at t_2 and E at t_3 .

Now if one's perceptual experience was constrained to a momentary present, then one could only ever hear the individual notes, C at t_1 , D at t_2 and E at t_3 . At no time one could hear the tune *as tune*, that is as a succession of three tones, for the duration of the tune temporally *exceeds* what happens at any individual time. It seems that, in order to hear the tune at any time t as a tune, one needs to be aware of some *additional* fact than just the tone played at that time. Hearing E, one also needs to be aware of the fact that E *follows on* from D and that D *followed on* from C — but how is that possible if we only experience what happens then and there, at the present moment?

⁶ Macpherson suggests that we can see 'global contradictions' but not 'local contradictions'. We are for example able to see impossible figures, but only when the elements of the figure are not themselves contradictory. See for example (Macpherson 2010). The relevant contradictions here would be local contradictions though.

One might be initially puzzled by the problem that the example is supposed to illustrate. Even if our perceptual experience was restricted to moments, and at each moment just a single tone played, what is the problem in hearing the tune as the tones are played successively? Contrast the case above with another example:

Case 2:

S hears a single note, E, at a time t_3 .

How does the hearing of E in the first case differ from hearing E in the second case? One might think that the difference is simply just that in the first case, S has just heard a C and a D, and in the second case S has just heard nothing before the E. And one might further hold that there is nothing more needed than these 'irreducible temporal facts' to explain the difference between the two cases (cf. Phillips 2010). Somebody who is inclined to think that way, might explain case (1) as follows: Just as the rapid succession of motion-free pictures in a film creates an experience of motion, the rapid succession of momentary tone experiences suffices to generate an experience of a tune.⁷

Although this "naïve view" is initially not entirely lacking intuitive appeal, almost everybody in the debate rejects it. First of all, as Dainton points out, the analogy with the cinema does not work. In the cinema, the static momentary pictures create an illusory experience of real motion. But the static momentary pictures are not momentary experiences that combine to an extended experience. They are stills, but they are not experienced *as* stills. They are perceptual stimuli that are processed by our brains such that we experience motion (cf. Dainton 2010). A second reason to reject the naïve view is that it is conceivable (thus possible)⁸ for a person to be in a situation as described in case (1), without having any experience of the tune as a whole. Consider the following:

⁷ This is not Phillip's position, although he does subscribe to irreducible temporal facts. I won't go into Phillip's theory in detail here because I don't think that his theory poses any interesting challenges to my argument.

⁸ Although it is debatable whether conceivability entails possibility, I shall assume it for present purposes as I have no time to discuss this here.

Case 3:

S has an auditory experience of three successive tones, C at t_1 , D at t_2 and E at t_3 while failing to have an experience of succession over and above the experiences of the individual tones.

We are all acquainted with case (3). If I hear a C on Monday, a D on Tuesday and an E on Wednesday, then I would fail to hear C D, and E as succession over and above hearing the individual tones. However, the claim here is that case (3) is conceivable for *all* experiences. The claim is that even if the tones were heard in direct succession, it is possible that one fails to hear them *as* succession. A comparison with yet another case might be helpful:

Case 4:

Three people, x, y and z, are in three different rooms. At t_1 , x hears a C. At t_2 , y hears a D. At t_3 , z hears an E.

In case (4), the experiences of x, y and z do not combine to an experience of a tune C-D-E, because x, y, and z are different people and their experiences therefore disconnected. The argument against the naïve view is that it is possible for S's acoustic experience to be phenomenally indistinguishable at t_1 from x's experience at t_1 , at t_2 from y's experience at t_2 and at t_3 from z's experience at t_3 . In other words, the argument is that it is conceivable for a subject S that S's experience at time t is equally isolated from S's experience at time t_{+1} (or t_{-1}) as the experiences of x, y and z are at any time from each other. Husserl for example explicitly states this in remarking that

it is conceivable that our sensations could endure or succeed one another without our being aware of it in the least. (Husserl 1905/1964, p.31-2)

The thought is that the mere fact that a subject S has had an experience of C before having an experience of D does *not suffice* for S to have an experience of the succession C-D. As Husserl puts it,

[t]he duration of sensation and the sensation of duration are different. And it is the same with [succession]. The succession of sensations and the sensation of succession are not the same.

(Husserl 1905/1964, p.31)

James famously expressed the same thought:

A succession of feelings, in and of itself, is not a feeling of succession: we must think of A and B as one after each other, but we must think them simultaneously. (James 1890, p.629)

What Husserl and James have in mind is that in order to hear a tune *as* a tune at any time t, one needs to have an experience of a succession of tones *at that time t*. More generally put, the claim is that to be at any time perceptually aware of a temporal structure such as change, succession or duration, the whole structure must be represented at that very moment in time (cf. Phillips 2010). The claim goes back to Kant, who writes that

representation, in so far as it is contained in a single moment, can never be anything but absolute unity. (Kant 2003 A99), quoted in (Phillips 2010).

Guyer interprets Kant's claim as follows:

[What this claim] implies is precisely that although, of course, the manifold of subjective states occurs or is given successively, knowledge at any particular time that any particular succession of such states has occurred must be based on the single representational state available at that time. (Guyer 1987), quoted in (Phillips 2010).

The consensus appears to be that in order to have a perceptual experience of a tune, or of a change or a succession in general, all tones, or all parts of the change or of the succession, have to be experienced *together*. In order to perceptually experience change *as* change, we have to be, *in some way or other*, aware of more than what presently occurs.

The claim that in order to perceptually experience change we have to be somehow aware of more than what is currently present to us, is acknowledged by all sides of the debate. The big question is *how* we are aware of things that do not presently occur. The first major divide in the discussion is between those philosophers that reject (A1), the idea that we can perceptually experience change and those which reject (A2), the idea that we can only perceptually experience what is momentarily present. I call the former *anti-realists about temporal perception (tp-anti-realists)*,

and the latter *realists about temporal perception (tp-realists)*.⁹ My intention here is not to give a complete account of the different theories of temporal perception, or to judge which theory solves the paradox of temporal perception best. Instead, my aim is to show that the Argument from Experience fails on all major accounts of temporal perception. None of the theories can accommodate perceptual experiences as of absolute becoming, the change that constitutes temporal passage. I shall compare three theories, one type of major tp-antirealist account and two types of major tp-realist accounts. I will go through all three theories in turn, starting with a brief introduction and then the argument why we could not experience absolute becoming given that account.

8.2 The memory theory of temporal perception

Antirealists about temporal perception accept A2 and A3 but reject A1. In other words, they think that if changes were experienced, they would have to be experienced as taking time, and that our perceptual awareness is bound to the present moment. As a consequence, they deny that we can perceptually experience change. Somebody who famously held this position was Reid, who argued that we cannot, ‘strictly and philosophically speaking’, experience change or any kind of succession.¹⁰

It may be here observed that, if we speak strictly and philosophically, no kind of succession can be the object either of the senses or of consciousness; because the operations of both are confined to the present point of time, and there can be no succession in a point of time; and on that account the motion of a body which is a successive change of place could not be observed by the senses alone without the aid of memory. (Reid 1855 essay III, chpt v)

According to Reid, we only experience what is going on right now. Given that change cannot occur at a single moment of time (or, more precisely, that we cannot experience change as occurring at a single moment of time), we can only be said to experience it in the “loose sense” with the help of memory. Simple accounts of such a *memory theory* argue that we are aware of

⁹ Tp-realism is defended among others by Dainton (2008b, 2008a, 2010; 2011; 2000), Foster (1982), Le Poidevin (2004, 2007), Phillips (2009, 2010), Tye (2003) and Zahavi (2007). Tp-antirealism is defended among others by Dennett (1991), Kelly (2005), Mabbott (1951, 1955) and Plumer (1985).

¹⁰ Recall that I have explained change as a kind of succession: a succession of distinct atomic events. If the events are qualitatively distinct, then the succession constitutes qualitative change, otherwise quantitative change. Every change and every succession constitute a duration of time.

change by perceiving what happens now, while remembering at the same time what has happened just before. Thus a simple memory theory explains case (1) such that at t_3 , S is aware of the succession C-D-E in virtue of *remembering* C and D while perceiving E.¹¹

In general, memory theories face a number of serious objections. One common objection is to point out that the phenomenology of memories is rather distinct from that of perceptual experiences ((cf. Dainton 2000) and (Kelly 2005)). If our awareness of change was based on memory rather than on perceptual experience alone, then the phenomenology of change experience (or any temporal experience) would be rather different from genuine perceptual experience, but this does not seem to be the case. In reply, memory theorists could claim that compounds of memory and perceptual states have a unique phenomenal character that does not necessarily reflect any phenomenal differences between memory and perceptual experience. Simple accounts of the memory theory might also be blamed for not being able to distinguish between recent and more distinct memories (cf. Dainton 2000, p.124). The objection is that they could not distinguish between S experiencing E and having experienced C and D immediately before, and S experiencing E and having experienced C and D hours or days ago. Only the former but not the latter amounts to an experience of succession though, so the analysis of these two cases should better not be the same. Moreover, if S merely remembers having heard a C and a D before hearing E, then it is hard to explain how S could distinguish between the tune C-D-E and the tune D-C-E (cf. Dainton *ibid.*) and also (Phillips 2010, p.14). According to Dainton, the most plausible accounts of the memory theory restrict the relevant memory to involuntary short time memory and allow memories of succession (cf. Dainton 2000, p.125). Whether the objections against the memory theory prove devastating or not, the memory theory in general appears to have a problem in justifying that we do not perceptually experience temporal phenomena, although it seems very natural and obvious to think that we do.

As mentioned before, my focus is not to give a fully worked out evaluation of various temporal perception theories. What is important here is that the defender of AFE cannot choose to be an antirealist about temporal perception. If the memory theory is correct, then we could

¹¹ Philosophers that have defended memory based accounts of temporal perception include Le Poidevin (2007), Mellor (1998) and perhaps Phillips (2010).

not have perceptual experiences as of absolute becoming. Therefore, we could not infer from experience that time passes. Let me explain.

First of all, remember that absolute becoming is supposed to be a kind of change. The tp-antirealist denies that we can perceptually experience change. Instead she needs to say that we *infer* change from two unchanging experiences. If we merely infer absolute becoming though, rather than experience it, then it can hardly be the case that our awareness of absolute becoming is *best explained* by the fact that time passes.¹² Recall once again what I have said in the previous two chapters about experiences that would not be best explained by the fact that time passes. Among these are for example experiences that would not be caused by temporal passage (see 6.5).¹³ If I infer from my static perceptual experiences that time passes, then temporal passage is not the cause of my experience of passage. Therefore my experience of passage would not be best explained by the fact that time passes. If the memory theory of temporal perception is correct, then the Argument from Experience fails.

It follows that the defender of AFE requires for her argument a realist account of change perception. In the next sections, I will focus on the two major tp-realist accounts. I will argue that both accounts cannot accommodate perceptual experiences as of absolute becoming in the way needed by the defender of AFE.

8.3 Specious present theories

All major tp-realist accounts are '*specious present theories*'. The term 'specious present' was coined by the psychologist Clay (1882), but the theory of the specious present was made famous by James (1890).¹⁴ In contrast to others before him, James believed that we have (purely) perceptual experiences of change and succession. Rather than just making us aware of what is right here now, James thought that our experiences would make us aware of what happens

¹² There may be other forms of non-inferential knowledge apart from perception (some form of basic *a priori* knowledge), but none of these are relevant here. Note also that for the same reasons that we could not experience any changes in the world we could not experience changes in our own mental states either.

¹³ I will come back to these types of experience in the last section of this chapter.

¹⁴ Although Clay was the first to coin the term 'specious present', it is relatively hard to retrieve more information about him or his work. According to Andersen and Grush (2009), the name 'E.R. Clay' is a pseudonym for the psychologist Robert Kelly. The book attributed to him, 'The Alternative: A study in psychology', was anonymously published in 1882. Unfortunately I was not able to find complete bibliographical information about it.

over short intervals of which we are aware of *as present*. He called the period of time that is experienced as present, the specious present. The term 'specious present' adverts to the fact that the experienced present (the present as experienced) deviates from the objectively present time. Whereas the objective present is standardly taken to be a moment, the specious present is supposed to have temporal depth. James referred to the specious present as a *duration-block* (cf. Dainton 2010)), which he characterized as follows:

We do not first feel one end and then feel the other after it, and from the perception of the succession infer an interval of time between, but we seem to feel the interval of time as a whole, with its two ends embedded in it. (James 1890, p.610)

Thus, according to specious present theories in general, changes or successions are represented *all together as a whole* during the short interval that is perceptually represented *as present*. Although we are supposed to be aware of successions and changes 'all at once', they are represented as temporally extended — a somewhat puzzling claim that different specious present theories explain in different ways. I shall come back to this later. There are two major types of specious present theories, which I shall call, following Dainton, the *retentional theory* and the *extensional theory* (cf. Dainton 2011). For the next section, I shall focus on the retentional theory. The question I am interested in is the following: Assuming the retentional theory is correct, is it possible for us to have purely perceptual experiences as of absolute becoming? I shall first introduce the retentional theory before I argue that, on this theory, we cannot have purely perceptual experiences as of absolute becoming.

8.4 The retentional theory of temporal perception

Traditionally, specious present theories all used to be retentional theories of temporal perception.¹⁵ Like all specious present theories, retentionalists argue that we can perceptually

¹⁵ We find various versions of the retentional theory in Husserl (1905/1964), Brentano (1888), Meinong (1978/1899), Russell (1915) and Broad (1923; 1938). Husserl for example thought that to experience succession, we need to perceptually represent what is currently present and *retain* the immediate past, where what is retained (the *retention*) differs from memories in that they are sensory, and from perceptual experience in that what is represented is represented as past. Similarly, Brentano thought that we would 'intend' to the past parts of the succession as (recently) past. Meinong held that representations of the immediate past are 'reproductions' of perceptual experiences and Russell took them to be fading 'akoluthic sensations'. In all cases the representation of the past is distinguished from a memory. Broad, finally, held that we can actually *perceive* what pertains to a short interval stretching from the present into the past.

experience *more* than what is momentarily present. The basis of the retentional theory is formed by a combination of three principles:

- (i) Our perceptual experience is not confined to what is (was) momentarily present.
- (ii) In order to have a perceptual experience of a temporally extended structure as temporally extended, all parts of that structure have to be experienced together.

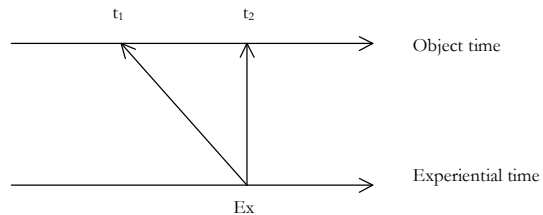
And a principle that Miller calls

- (iii) *The Principle of Simultaneous Awareness* (PSA):

If we are directly aware of the immediate past, this awareness is located in the present. (Miller 1984, p.109)

When we combine (i) to (iii), then the view is that to perceptually represent change, we need to be aware of all parts of the temporally extended structure at the momentary present. PSA is the doctrine that differentiates the retentional theory from the other realist account, the extensional theory. According to PSA, we are, *at any instant*, aware of what occurs over an interval of time. This distinguishes a succession of experiences from an experience of succession: we experience succession only when the succession is experienced together, in one instantaneous experiential act. It follows that, according to the retentional theory, one's experience needs to 'literally embrace' (Phillips 2010, p.6) at a moment the entire temporal structure that constitutes change:

Diagram 1



Consider the diagram: at t_2 , the experience 'Ex' is a representation of what occurs over the objective time interval t_1-t_2 , where t_1 is in the immediate past and t_2 is present. The interval t_1-t_2 is represented at t_2 as present and thus constitutes the experienced or specious present. Thus,

according to the retentional theory, we perceptually represent at a moment things that have duration, and we represent them as having duration.¹⁶

This strikes many as counter-intuitive. Some, as for example Kelly, go even so far as to say that our being aware of duration at an instant 'simply makes no sense' and has 'no sensible interpretation' (2005, p.211). What seems to puzzle Kelly is the idea that experiencing succession necessarily takes time, so it seems to be straightforwardly incoherent to assume that we experience succession at a time. According to Kelly, the only way to experience succession at a time would be to experience all elements of the succession together at that time. In that case though, we would not experience the succession as succession. Take the example of hearing a tune C-D-E again: if the only way to experience the tune at a time would be to experience all its constitutive tones together, then we would not experience a tune but a musical chord.

There are two aspects to Kelly's objection. Firstly, Kelly appears to doubt the coherence of any theory suggesting that we experience duration at a moment. But this criticism is surely too rash. It should be considered that temporal perception is unique in that experiences not only represent objects as having temporal properties, they themselves instantiate temporal properties. When an experience represents the duration of some thing, the experience, that is, the *experiential act* itself, has a certain temporal shape — it may last for some time or occur at a moment for example. In contrast, a perceptual experience as of a red apple is not itself coloured or shaped in any way.¹⁷ In other words, experiences do not have shapes, sizes, weights, or colour properties, but they do have temporal properties. Coming back to the retentional theory, it is by no means clear why the temporal structure of the experiential act could not come apart from the temporal structure of what is represented, as illustrated in diagram (1).

A second worry of Kelly seems to be that a momentary representation could not distinguish the successive elements of a temporally extended structure. This objection is not new. Broad

¹⁶ Traditional accounts of the retentional theory have not formulated in terms of representationalism (Broad for example was a sense-datum theorist). In contemporary versions however, representationalist accounts have been given as well (cf. Tye 2003), (Kiverstein 2010)). In presenting the theory, I stick to the minimal representational framework I have introduced in chapter six.

¹⁷ Different perceptual theories will express this claim in different ways. A sense-datum theorist would say that the awareness of the sense-datum won't be coloured or shaped. For a physicalist, who holds that mental states are brain states, mental states have a colour — presumably grey. However, the physicalist will say that one is not aware of the colour or the shape of the brain.

(1938, vol.2, p. 283 pp.) attempts to answer it by introducing a new phenomenal property, which he calls *presentedness*. Within a specious present, we are aware of a temporally extended structure with instantaneous parts, which instantiate various degrees of presentedness. Consider a perceptual experience of a short succession of instantaneous events. The latest event, which is the presently occurring event, possesses the greatest degree of presentedness. From there, the degree of presentedness gradually fades to the least presentedness, possessed by the furthest past event. The diagram below, taken from Dainton (2010), helps to illustrate the idea:

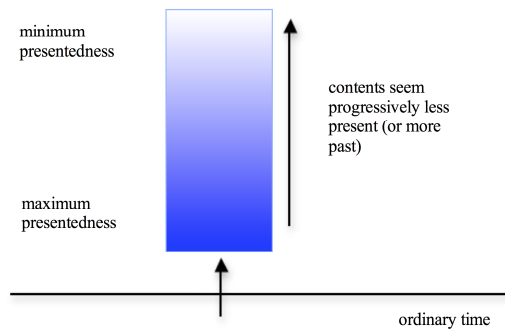


Diagram 2

The succession seems to be spread out in time, although all parts of it are represented at the same moment. The diagram (2) brings to mind Broad's paper strip analogy (1938, p.283): The gradual fading of greyness on the strip from one side to the other is analogous to the fading of presentedness from what is represented as present to what is represented as furthest past. Some have criticized Broad for not expanding more on the notion of presentedness, but the general idea seems simple. The more past the object of experience is, or seems to be, the more 'pale', the less vivid, it is represented.

I shall not go further into the intricacies of the retentional theory for I do not want to depart too much from the focus of this chapter.¹⁸ In any case, whatever other "technical" problems the retentional theory might have, it is surely not straightforwardly 'non-sensical'. In

¹⁸ For further discussion of the retentional theory of temporal perception see for example Dainton (2000), Philipps (2010) and Tye (1995).

the next sub-section I will turn to whether we could experience temporal passage, assuming the retentional theory is true.

8.4.1 The retentional theory and absolute becoming

Assuming the retentional theory of temporal perception, can we have purely perceptual experiences of absolute becoming? I argue not. The reason is that we could not phenomenally distinguish between absolute becoming, and change as it would be if time did not pass. In other words, if the retentional theory is correct, then our perceptual experience is silent on the question whether time passes or not. Or so I shall argue. To facilitate reading, let me call change that is constituted by absolute becoming *A-change*, and change, as it would be if time did not pass, *B-change*. Put in these terms, my argument is that the retentional theory of temporal perception cannot account for visual experiences of *A-change as A-change*, because all changes would look like *B-change*. I begin by arguing that if one's visual experience is meant to support the claim that time passes, then it should better be the case that the content of one's visual experiences of *A-change* would be different from the content of one's visual experiences of *B-change*. I then attempt to show that this is not the case.

If experience is to be of time passing, then we must be able to phenomenally distinguish between an experience of *A-change* and an experience of *B-change*. If a subject's perceptual experience would be the same whether time passes or not, then the subject would not be in a position to say, on the basis of that experience, whether time passes or not. Prosser makes a similar point:

For any two conditions *A* and *B* if the *phenomenal character* ('what it is like') of the subject's conscious experience would be the same whether *A* or *B* were true then that experience does not allow the subject to discriminate between *A* and *B*. Consequently if experience were to help decide between the *A-theory* and the *B-theory* then the two theories would have to have different consequences regarding the phenomenal character of experience.

(Prosser forthcoming, p.2-3)¹⁹

¹⁹ Prosser argues, like me, that we cannot argue from experience to the fact that time passes. Unlike me though, he thinks that temporal passage could only be a condition for perceptual experience. As an 'enabling condition', it

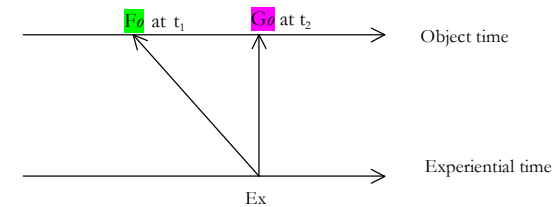
Note that I am not arguing that we cannot have perceptual experiences of A-change. I claim that, given the retentional theory, we cannot have perceptual experiences of A-change *as* A-change. If time passes, and if the retentional theory is true, it might well be that we perceive A-change, but we could not represent it differently from B-change. Thus, even if time passed and the retentional theory was true, we would not be in a position to infer from experience that time passes. Let me explain.

The retentional theory holds that we can perceptually experience, at an instant, what occurs over a short interval that stretches from the moment of experience a little time back (cf. diagram 1). When we have a perceptual experience of change, we are ‘all at once’ aware of that change, but we are nevertheless aware of it *as* change, that is, as a temporally extended structure. This apparent contradiction is explained with the fact that the temporal structure of the change experienced comes apart from the temporal structure of the experiential act. Whereas the object has some duration, the act is instantaneous. Consider some object o that changes from being F at t_1 to G at t_2 . Now, if time passes, then o ’s change is dynamic in that it is constituted by absolute becoming: o changes from F to G, by virtue of the fact that t_1 and everything that is located at t_1 ceases to exist and t_2 and everything that is located at t_2 comes into existence. Or, differently put, o changes by virtue of the fact that the event (Fo at t_1) ceases to exist and the event (Go at t_2) comes into existence. In contrast, if time does not pass, then o ’s change is static. In that case, o ’s *always* F at t_1 and *always* G at t_2 . A-change is *brought about* by temporal passage, that is, absolute becoming, whereas B-change is qualitative variation over time that does not require absolute becoming to occur. Differently put, the central difference between A-change and B-change is that only A-change involves a change in what exists: o ‘A-changes’ from F at t_1 to G at t_2 , if and only if (Fo at t_1) ceases to exist and (Go at t_2) comes into existence. In contrast, o ‘B-changes’ from F at t_1 to G at t_2 , if and only if o is F at t_1 and G at t_2 . In order for a subject S to have a visual experience of A-change *as opposed to B-change*, S must visually represent change as absolute becoming, that is, *as a change in what exists*.

could not enter into the content of our experience. In contrast, I think that temporal passage is a unique kind of change that cannot be perceptually represented as different from B-change.

To understand what is at stake here, it is important to recall the distinction between ‘existence at a time’ and ‘existence *simpliciter*’ (cf. 5.2). To facilitate reading, I shall call existence at a time ‘existence_t’ and existence *simpliciter* ‘existence_s’. A change of what exists_s is a change of reality itself. When some object o ceases to exist_s, it ceases to be part of reality, that is, it ceases to be real. Analogously, when o comes into existence_s, it becomes part of reality. Existence_t, on the other hand, is merely a question of temporal location. To say that some object o has come into existence_t is to say that o is not located at any time prior to the time of reference²⁰. To say that o ceased to exist_t is just to say that o is not located after the time of reference. Note that an object might exist_s after it has ceased to exist_t, or before it came into existence_t. On the other hand, an object that does not exist_s, cannot exist_t. Temporal passage is constituted by absolute becoming, which is a change of what exists_s. A-change involves a change in what exists_s, whereas B-change only involves a change in what exists_t. There is no problem in representing B-change in experience, since there is no problem in visually representing that Fo exists (is located) at t_1 but not after that, and that Go exists (is located) at t_2 , but not before that.

Diagram 3



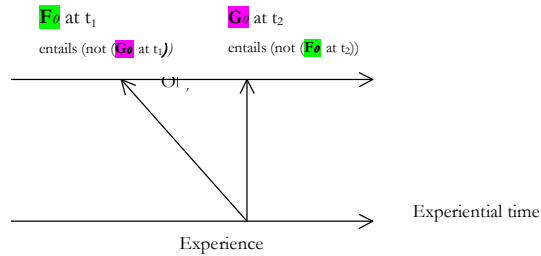
The diagram depicts a retentional experience of static B-change: an object is experienced to change from F to G (here depicted as green to pink), by virtue of experiencing it all at once (at t_2) as green at one time and as pink at another time. However, such an experience, an experience of existence_t change, is compatible with time not passing. It does not amount to an experience of temporal passage. To experience temporal passage, we have to experience a change in what exists_s, and for the Argument from Experience (AfE), to work, we would have to experience it *as phenomenally distinct* from a change in what exists_t.

²⁰ The time of reference can be the time of the utterance of the sentence, or the time of the thought or, as here, the time of the experiential depiction.

Take again the change that our object o undergoes from F at t_1 to G at t_2 . To experience Λ -change as A -change, a subject S would have to represent o 's change as Fo ceasing to exist_s, and $G\theta$ coming into existence_s. One might (mistakenly) think that to represent this, one would only have to represent that $F\theta$ is located at t_1 and not after that, and that $G\theta$ is located at t_2 and not before that. More precisely, one might mistakenly think that o 's Λ -change could be experientially represented in one of the following two ways:

- (i) S is perceptually aware of $F\theta$ at t_1 and $G\theta$ at t_2 . The fact that o is F at t_1 entails that o is not G at t_1 , and the fact that o is G at t_2 entails that o is not F at t_2 ²¹. Therefore S is also aware of not ($F\theta$ at t_2) and of not ($G\theta$ at t_1).

Diagram 4



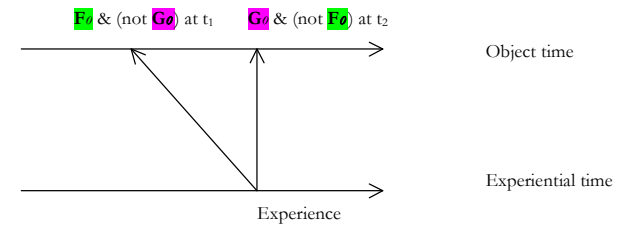
S's perceptual experience of $F\theta$ and $G\theta$ entails S's awareness of the fact that $F\theta$ does not exist anymore at t_2 , and that $G\theta$ does not yet exist at t_1 .

- (ii) If one thinks that *absences* can be represented in experience, then one might think that when S experiences o changing from F to G, then S is perceptually experiences $F\theta$ at t_1 and its absence at t_2 , and $G\theta$ at t_2 and its absence at t_1 .²²

²¹ By definition, if o changes from F to G, then F and G are mutually exclusive properties. If F and G are mutually exclusive, then the fact that o is F entails that o is not G and vice versa.

²² Supposed examples of perceiving absences include, 'hearing pauses, seeing the total darkness of a cave, sensing the emptiness of your stomach, or feeling the holes in old-fashioned computer paper by running your finger down the sides of the page' (these examples are from Sorensen (2004), listed in Siegel (2005)). See also Sartre (1958).

Diagram 5



S perceptually experiences that $F\theta$ does not exist anymore at t_2 , and that $G\theta$ does not yet exist at t_1 .

Unfortunately, neither (i) nor (ii) can help the defender of AfE. (i) suggests that S's perceptual experience of o 's change entails S's awareness of a change in what exists_s, that is, entails S's non-perceptual awareness of Λ -change. However, a non-perceptual awareness would not be the right kind of awareness for AfE. That said, even if S's non-perceptual awareness of Λ -change would qualify as a state that is best explained by temporal passage, that would not help. According to the case as described by (i), S would not be aware of Λ -change, neither perceptually nor non-perceptually. At most, all that S would be non-perceptually aware of is that (not $F\theta$) at t_2 and that (not $G\theta$) at t_1 . S's awareness of the fact that $F\theta$ does not exist anymore at t_2 , and that $G\theta$ does not yet exist at t_1 is an awareness of existence_r change. It is compatible with the fact that $F\theta$ always exists at t_1 and $G\theta$ always exists at t_2 . It is compatible with the fact that time does not pass.

A similar answer applies to (ii). According to (ii), S has (at t_2) a visual experience of $F\theta$ at t_1 and of the absence of $F\theta$ at t_2 , of $G\theta$ at t_2 and of the absence of $G\theta$ at t_1 . However, S's visual representation would look like a visual representation of static B-change, that is, indistinguishable from B-change from the subject's point of view. To experience Λ -change as opposed to B-change, it does not suffice to visually represent $F\theta$ at t_1 and $G\theta$ at t_2 , even if that entails, or even if we also experienced, that $F\theta$ is not at t_2 and that $G\theta$ is not at t_1 .

The problem is that what Λ -change is, and how we are supposed to perceptually experience change according to the retentional theory, is not compatible. On the one hand, we are supposed to perceptually represent events, that is property instantiations at times, into and going out of existence *simpliciter*. On the other hand we are supposed to perceptually represent the interval over which the change occurs. Differently put, to have a perceptual experience of (any)

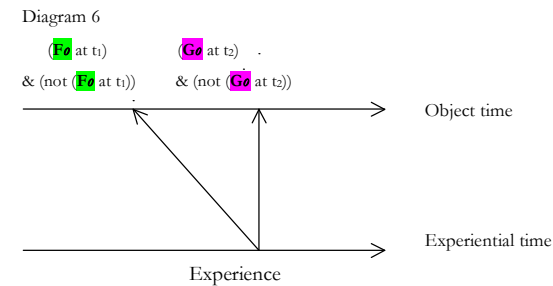
change, the retentional theory requires us to represent an interval, whereas Λ -change is an ontological change from one time to the other. If time passes, then intervals do not exist, for it is precisely the *replacement* of one present time with the next present time that constitutes temporal passage. So how could that be represented by representing an interval? The retentional theory explains the perceptual experience of change very much akin to perceptual experiences of spatial variation: as instantaneous perceptual representations of qualitatively heterogeneous extensions (of time or of space). Such a heterogeneous ‘spread’ is in itself static. It is therefore not surprising that the retentionalist cannot represent a dynamic change by representing a static spread. Here is yet another way to put it. At the heart of the problem is the fact that the retentional theory can only account for experiences of *qualitative* change, where qualitative change requires its subjects to survive. Absolute becoming, though, is not qualitative change but strong substantial change, the coming into and going out of existence of instantaneous entities (see 5.1). Before I continue with my argument let me briefly explain this very point.

Is it the case that, given the retentional theory, we could not experience *any* quantitative change? This would be bad, because we certainly seem to perceive some quantitative changes. Watching the magician, I seem to see the rabbit disappearing from his top hat. The retentional theory does not have any problem in explaining such experiences. However, this does not contradict my point that the view can only account for experiences of qualitative change. Every ordinary quantitative change is related to some relational qualitative change.²³ When the rabbit disappears, then the hat changes from being ‘with rabbit’ to being ‘without rabbit’ (see also 5.2). The retentionalist can claim that when we seem to perceive the rabbit disappearing, we visually represent (all at once but in succession) the hat with the rabbit and the hat without the rabbit. More generally put, a subject *S* experiences a quantitative change of *x* by experientially representing a corresponding relational change of *y*. Thus the retentional theory has no problem in explaining perceptual experiences of ordinary quantitative change.

The problem with Λ -change is that it is no ordinary quantitative change. When Λ -change occurs, there is nothing that persists. In other words, there is no qualitative change that is related to and occurs together with Λ -change. But suppose now, for *reductio ad absurdum*, that we would visually represent Λ -change as qualitative change in terms of the property of existence_s. This

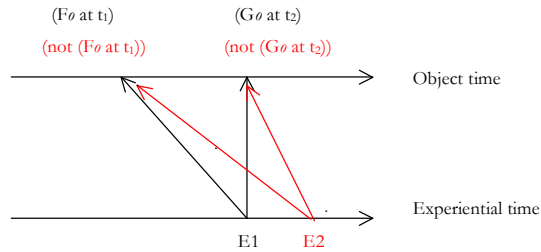
²³ Recall that I call every change in terms of properties ‘qualitative change’ (cf. chapter 5).

would require us to represent a contradiction: we would have to visually represent the $(F\theta$ at t_1) as instantiating existence_s, but we would also have to represent $(F\theta$ at t_1) as not instantiating existence_s. The reason is that $F\theta$ ceases to exist_s when the time at which it is located, t_1 , ceases to exist_s. Thus when t_1 ceases to exist_s, then $(F\theta$ at t_1) also ceases to exist_s. Therefore, to represent the Λ -change that θ undergoes we would have to represent $(F\theta$ at t_1) instantiating existence_s and $(F\theta$ at t_1) not instantiating existence_s. Similar for $G\theta$. To visually represent that $G\theta$ has come into existence_s, we would need to represent that $(G\theta$ at t_2) does not instantiate existence_s and that $(G\theta$ at t_2) does instantiate existence_s.



Thus to perceptually experience Λ -change as Λ -change, we would have to represent a contradiction: $(F\theta$ at t_1) and $(\text{not } (F\theta$ at $t_1))$, and $(G\theta$ at t_2) and $(\text{not } (G\theta$ at $t_2))$. We cannot experientially represent $(F\theta$ at t_1) and $(\text{not } (F\theta$ at $t_1))$, so we would have to represent $(F\theta$ at t_1) and $(\text{not } (F\theta$ at $t_1))$ at different times. (And analogously for $G\theta$). Given the retentional theory and its two independent time levels (objective time and experienced time), this could be understood such that two successive experiential acts occur, representing different events occurring at the same times. But then we have not escaped the contradiction in content (see diagram next page):

Diagram 7



One problem is that we would end up with conflicting experiences. The other problem is that it is difficult to see how such experiences would amount to any experience of change at all. Thus the only way that we could experientially represent θ 's A-change from F to G, is to represent it in the very same way as we would experientially represent B-change: $(F\theta$ at t_1) and $(G\theta$ at t_2), such that $\text{not}(F\theta$ at t_2), and $\text{not}(G\theta$ at t_1) are either entailed or experienced as absences. This brings us back to diagram (4):

Diagram 4

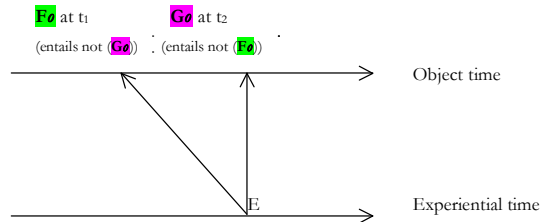


Diagram (4) depicts the same kind of change as diagram (3), namely B-change. This shows that, given the retentional theory of temporal perception, A-change could only be visually represented to look the same as B-change. It follows that, given the retentional theory, we cannot infer from experience whether time passes or not.

Some people might not be convinced that in order to represent A-change as A-change, we would have to represent a contradiction. Instead they suggest that we could just experientially

represent that $F\theta$ *did* exist and $G\theta$ *exists* now. The problem with that suggestion is that it is unclear what the past tense in the experiential content represents. The B-theory can accommodate tensed sentences like ' $F\theta$ did exist', but such a sentence is made true for the B-theorist by the fact that $F\theta$ is located earlier than my utterance of the sentence. Similarly, B-theorists who think that we experientially represent B-change, can agree that when S experiences θ changing from F to G, S experientially represents that $F\theta$ *did* exist and $G\theta$ *exists now*, but that experience is accurate for the B-theorist when $F\theta$ is located before S's experiential act, and $G\theta$ is located at the same time as S's experiencing it. For the dynamic theorist who experientially represents A-change, the experiential content would also be ' $F\theta$ *did* exist and $G\theta$ *exists now*', only that her experience would have different accuracy conditions: it would be accurate if $F\theta$ ceased to exist, and $G\theta$ has come into existence. The problem however is that from S's perspective the experiences would be indistinguishable.

In the next section, I shall turn to the other realist account of temporal perception, the extensional account.

8.5 The extensional theory of temporal perception

In this section I will show that the extensional theory of temporal perception and standard presentism, the only view that can (without a doubt) accommodate temporal passage, are metaphysically incompatible. I will also explore two non-standard forms of presentism that are prima facie compatible with the extensional theory, but that have other problems. The section is divided into five sub-sections. It begins with a brief introduction of the extensional theory. In sub-section two I argue that standard presentism and the extensional theory are incompatible. In the third sub-section I present a way to solve this problem which involves denying that the (objective) present is instantaneous. I discuss an 'Augustinian' argument to the effect that the present is instantaneous and argue that there are two objections to it. The two objections to the Augustinian argument lead to two non-standard forms of presentism. The last two sub-sections discuss both of these non-standard theories. I argue that one of them is incoherent and that the other one does not allow for experiences of absolute becoming. The conclusion is that we cannot have experiences of temporal passage given the extensional theory of temporal perception.

The structure of this section will be as follows:

- (8.5.) The extensional theory of temporal perception
 - (8.5.1) The extensional theory and absolute becoming
 - (8.5.2) The Augustinian Argument
 - (8.5.3) Compound Presentism
 - (8.5.4) Simple Presentism

Just like retentional theories, the extensional theory of temporal perception holds that we can perceptually experience temporally extended structures such as changes and successions.²⁴ When I presented the retentional theory, I introduced three central principles of that view:

- (i) Our perceptual experience is not confined to what is (was) momentarily present.
- (ii) In order to have a perceptual experience of a temporally extended structure as temporally extended, all parts of that structure have to be experienced together.
- (iii) *The Principle of Simultaneous Awareness* (PSA):

If we are aware of the immediate past, this awareness is located in the present. (Miller 1984, p. 109).

Extensional theories subscribe to the first two principles but reject PSA. Instead they support an intuitively more plausible principle, which Miller calls *the Principle of Presentational Occurrence* (PPC):

PPC

(...) the duration of a content being presented is concurrent with the duration of the act representing it (...) the time interval occupied by a content which is before the mind is the very same time interval which is occupied by the act of representing that very content. (Miller 1984, p.109)

PPC expresses the most important difference between retentionalists and extensionalists. For the extensionalists, experiential acts are never momentary but always extended. As Foster puts it,

²⁴ Extensional accounts of temporal perception have been early supported by Stern (1897/2005) and Mundle (1954, 1966), and lately defended in the more elaborate form of the *Overlap Theory* by Foster (1982) and Dainton (2001, 2003, 2008b, 2008a; 2000).

We have to take each experience to extend over a period of real time in a way which exactly matches the phenomenal period it presents. (Foster 1991, p.249)

That is to say, the extensional theory rejects the idea that all parts of a succession are represented at a single moment (PSA), while adhering to the principle that successions are represented 'together, as a whole'.²⁵ Consider two successive tones, Do and Re. The extensional theory holds that we can perceptually experience the succession of (Do-Re) and that the perceptual act is concurrent with what is experienced: if the succession Do-Re seems to occur over two seconds, say, then the experiential act will also take two seconds.²⁶ During this short period we are perceptually aware of (Do-Re) — both tones seem present to us, although as occurring in succession. This appears initially counter-intuitive: as Le Poidevin (2007, p.87) asks, how can something that is experienced as present not be experienced as simultaneous? The extensionalist answer is that Do and Re are experienced as *phenomenally* present (rather than metaphysically present), in the sense that both have a psychological 'presence', although they appear in succession.

The retentional principle PSA was motivated by the need to unify successions in experience. With PSA discarded, one might worry whether there is anything that prevents a temporally distributed awareness from being fragmented.²⁷ In other words, how does the extensional theory differentiate between a succession of experiences and an experience of succession? This is accounted for by the fact that temporally extended experiences are *phenomenally unified*. To explain what this means, it will be helpful to introduce some terminology.

Consider a temporally extended experience Ex, which occurs over an interval I (t_1 - t_2). For each time t within I , there is an experiential part of Ex, a *partial experience* pex, such that pex

²⁵ As with the retentional theory, I shall use representationalist vocabulary to present the extensional theory. Dainton himself assumes a 'projectivist' view of perception, according to which 'what is present is nothing but an internally generated and outwardly projected phenomenal image' (Dainton 2000, p.16). That said, his elaborate account of the extensional theory is largely independent from these commitments (cf. Zahavi 2007, p.454), and certainly compatible with a representationalist view of perception, although one might argue that certain details of the view are more vulnerable to criticism if expressed in representationalist terms. These details are not relevant for the arguments presented here though.

²⁶ It is notoriously difficult for extensionalists (and retentionalists) to determine the duration of a specious present. Dainton for example tentatively estimates it to last for 'half a second or less'. (Dainton 2000, p.171)

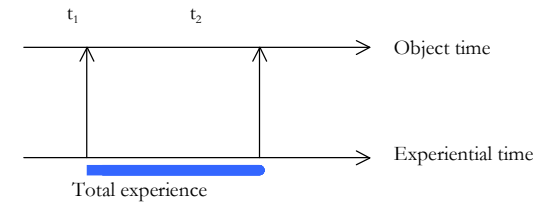
²⁷ This worry was first expressed already by Meinong (cf. 1978(1899), p.187).

represents what occurs at t . All partial experiences together constitute the *total experience* Ex (pex_1 - pex_2). During a total experience, all partial experiences are phenomenally unified, which is to say that the subject of experience is during the total experience aware of all partial experiences. Dainton specifies the phenomenal unity relation as a 'simple experiential relation' (2000, p.84), which he calls *co-consciousness*. To understand better what he has in mind, consider his example featuring synchronic co-consciousness:

Imagine a party game: participants are blindfolded and handed an object, and they have to work out what the object is relying on touch alone.(...)
 As you start to manipulate the object you have tactile sensations in your hands and fingers. These do not occur by themselves, but are continuous with the rest of your bodily experiences (e.g. your body-image: sitting hunched in a chair). You are also having some thoughts (...), emotional feelings (...), and mental images (...). These thoughts and images do not occur in isolation from one another, they are experienced together — they are *co-conscious* — both with one another (thought + emotional feeling + mental image) and your various bodily experiences. (Dainton 2000, p.3)

What Dainton has in mind is the phenomenal unity of our mental states. Individual experiences (and other mental states) *together* constitute a person's comprehensive mental life at a moment. There is something it is like to taste a good wine and there is something it is like to smell a good wine, but there is also something it is like to smell *and* taste a good wine at the very same time. The unity is given by the co-consciousness relation, which is according to Dainton primitive, that is, irreducible, basic and unanalysable (2000, p.180). According to Dainton's version of the extensionalist theory, the co-consciousness relation does not only hold at a time, but also over time. We are able to perceptually represent what happens over a period of time, by virtue of the fact that successive partial experiences are phenomenally united by the relation of co-consciousness:

Diagram 8

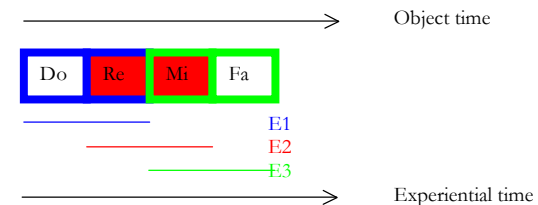


The extensional specious present, depicted by the blue bar in the diagram, refers to the real time interval in consciousness over which a total experience occurs. During that interval everything is represented as present:

I take a specious present to be a temporally extended total experience, i.e. a temporal spread of content whose parts are mutually co-conscious, and which is not part of a more extensive spread of content whose parts are mutually co-conscious. (Dainton 2000)

To put it once more in different words, total experiences are temporally extended complexes of co-consciously linked, momentary partial experiences. During a total experience, we are aware of all successive contents (contents of the momentary partial experiences), altogether, but as succession. The period over which a total experience occurs is the (extensionalist) specious present. The continuity of consciousness is ensured by the fact that total experiences overlap by sharing a part (a partial experience). Consider the succession of tones again:

Diagram 9



The diagram shows three total experiences: E1(Do-Re), E2 (Re-Mi) and E3 (Mi-Fa). They overlap by literally sharing a part, thereby ensuring the continuity of experience. Co-

consciousness is symmetric: if the partial experience 'Do' is co-conscious with the partial experience 'Re', then 'Re' is also co-conscious with Do. Synchronic co-consciousness is also transitive, and, within a total experience, diachronic co-consciousness is as well. It breaks down between total experiences though. Take two consecutive total experiences, made up by three partial experiences, (A-B-C) and (C-D-E). Within a total experience, co-consciousness is transitive: A is co-conscious with B, and B with C, thus A is co-conscious with C. The same holds for the second total experience: C is co-conscious with D, and D with E, thus C is co-conscious with E. Given that C is shared by both experiences, C is co-conscious with B and also with D, but the transitivity breaks down between B and D, which are not co-conscious. This breakdown of diachronic transitivity is necessary, for otherwise the extensionalist theory would imply that we are perceptually aware of everything that occurs over a period of being awake.

A notable weakness of the theory concerns the explanation of experienced order. The problem is that co-consciousness is symmetrical and thus cannot account for the asymmetry of direction in which (partial) experiences succeed each other. Dainton acknowledges this problem. What needs to be explained is the fact that

an individual auditory sensation itself exhibits flow. For the short time it lasts, the tone seems to be extruding itself forward into the future. (Dainton 2000, p.173)

He explains the directedness and the order of experiences with the fact that each partial momentary experience instantiates irreducible and basic temporal properties, properties of flow, thereby possessing an 'inherent direction' (ibid.). Total experiences exhibit a 'pheno-temporal pattern' such that the partial experiences appear to follow one another. Here is how Dainton puts it himself:

That Re has the pheno-temporal pattern of 'seeming to come after Do' is simply a part of the pheno-temporal pattern that constitutes E1. (...)

So we see that the fact that co-consciousness is symmetrical with respect to time is quite compatible with experience itself possessing an inherent direction: all that is required is for co-conscious experiences to have contents which are not symmetrical with respect to time. (Dainton 2003, p. 33)

The appeal to primitive and temporal properties leaves many unsatisfied. It leaves a taste of 'ad hocness' which might be a disappointment for otherwise well-disposed readers of the extensionalist doctrine.

The extensional theory has another problem or potential weakness which is particularly pertinent with regards to experiencing temporal passage. It is, as it stands, not compatible with presentism, the view that can accommodate temporal passage. I shall discuss this in the next section, where I argue that the extensional theory of temporal perception cannot account for perceptual experiences of temporal passage.

8.5.1 The extensional theory and absolute becoming

We have seen that we could not perceptually represent absolute becoming given the memory theory and that we could not perceptually represent absolute becoming in a way that would allow us to infer that time passes from experience given the retentional theory. Can the extensional theory accommodate perceptual experiences of absolute becoming? I argue not. The reason is that standard presentism and the extensional theory are incompatible. If time passes, then presentism, the view that only the present exists, is true.²⁸ But if reality is confined to a moment, than our perceptual experiences (by which I mean the experiential acts) cannot extend through time. Note that retentional theories do not have this problem: since they hold that our experiences of change take no time, they are perfectly compatible with presentism. To be more precise, the following claims seem to be incompatible:

- (1) We experience change as occurring over intervals.
- (2) To have a perceptual experience of an interval *I*, the act of representing *I* must be concurrent with *I* as it is represented in experience.
- (3) To exist is to exist in the present. Necessarily, all objects that exist are wholly located in the present. At any time *t*, if *t* is the present, the experience must therefore exist in its entirety.
- (4) The (objective) present is instantaneous.

²⁸ As I said before (cf. end of chapter five and beginning chapter six), temporal passage might or might not be coherent on the growing block theory. However, I will ignore the growing block theory here and focus only on the theory that can definitely accommodate temporal passage, namely on presentism.

Standardly, the (endurantist) presentist thinks that all (concrete) things exist wholly and entirely in the present. There is no such thing that has parts that exist at other times.²⁹ But if the experience exists in its entirety at one moment, then the presentist, who also wants to be an extensionalist about temporal perception, can not agree with (2): she cannot say that only temporally extended experiences can represent change, for on her view, such experiences do not exist. Consequently she would either have to reject the extensionalist theory, or deny that we can experience change altogether. That said, a *perdurantist presentist* would deny that things must exist *in their entirety* in the present; she might think that all things have temporal parts, of which only ever the present part exists. There is a sense in which temporally extended experiences exist for the perdurantist presentist — namely by virtue of a constitutive present part that exists.³⁰ This form of non-standard presentism, however, is not compatible with the extensional theory either, for we could not experience more than what is represented by the existing temporal part of the experience. So it seems as though the extensional theory is not compatible with presentism. Dainton acknowledges this:

One point is more obvious than most. If reality is confined to a momentary present in the way Presentists maintain, then it is difficult to see how any form of the Extensional approach can be true. (...) [I]f earlier and later stream-phases are experienced *together*, in the way Extensional models require, then it seems very plausible to suppose that these phases must both exist. (Or to put it another way: an experience which no longer figures in the sum total of reality is not in a position to be part of the same unified state of consciousness as an experience which *does* so figure, any more than a non-existent brick can help hold up a wall.) (Dainton 2010)³¹

If the extensional theory is not compatible with presentism, then we could not have perceptual experiences of absolute becoming. To declare the argument finished would be too quick though.

²⁹ This formulation is meant to be neutral with regards to what I call *soft presentism* and *hard presentism*. Soft presentism is the view that all times (in the abstract substantialist sense) exist, but only present *objects* and *events* exist. Hard presentism holds that only one abstract time, the present time, and all objects and events located at it, exist. Even though the formulation 'there is no such thing that has parts that exist at other times' seems to be more straightforwardly compatible with soft presentism, it is compatible with hard presentism if the sentence is interpreted such that there are no other times at which things could have temporal parts. (I am grateful to Prof. Correia for making this point). Obviously the distinction between soft and hard presentism makes only sense on a substantialist view of time.

³⁰ There are different ways how a perdurant presentist might spell this out. See for example Brogaard (2000) for a defence of perdurant presentism.

³¹ See also (Dainton 2011).

If one wants to hold on to presentism and to the extensional theory of perception, another option might be to reject the idea that the objective present is instantaneous. If the present had a brief duration, long enough to house a total perceptual experience, then the two views could be reconciled. This would then leave us with a different question: if presentism and the extensional theory were compatible, could we have perceptual experiences of temporal passage? The answer I shall give is still negative.

In what follows I will introduce the argument on which the view that the present is instantaneous is based. I determine two ways to challenge it, which reveal two non-standard forms of presentism. Both views will be discussed in terms of coherence and in terms of the question whether a combination of that view with the extensional theory would allow us to experience temporal passage.

8.5.2 The Augustinian Argument

The best known argument for the instantaneous present is St. Augustine's argument. Here is Le Poidevin's version of it:

- (1) Anything temporally extended has earlier and later parts.
 - (2) Any part that is earlier or later than a present part is not itself present.
 - (3) Something is wholly present by having only present parts.
 - (4) Anything with earlier and later parts cannot be wholly present. (from 2 and 3)
 - (5) Anything that is wholly present cannot be temporally extended. (from 1 and 4)
- (Le Poidevin 2011a, p.460)

I take the Augustinian argument to be valid, but there might be room for arguing that it is unsound. There are two ways to challenge it: either by rejecting the first premise or by rejecting the second premise. Rejecting the first premise reveals a non-standard form of presentism that I shall call *Simple Presentism*. Rejecting the second premise results in what Dainton introduces as *Compound Presentism* (2001). I will begin by assessing Dainton's proposal, Compound Presentism, before I turn my attention to Simple Presentism.

8.5.3 Compound Presentism

Compound Presentism, as introduced by Dainton (2001, p.87pp) could be understood as an attempt to reconcile the extensional theory of temporal perception with presentism, the view that only the present exists. Compound Presentism assumes that the present is a short interval of non-zero duration, an interval that comprises several successive times that are nevertheless all present. Here is how Dainton puts it:

The sum total of reality consists of at least two co-existing very brief reality-slices (each spatially three-dimensional). Suppose A and B are two such, and that A exists at t_1 and B exists at t_2 . One of these slices, A, is annihilated and a new slice of reality, C, comes into existence, and with it a new time, t_3 . Slice B is annihilated and D is created, along with t_4 ; and so it goes on. (Dainton 2001, p.87)

For the presentist, only present things exist; for the compound presentist, t_3 and t_4 are both present, thus all things that are located at t_3 and t_4 co-exist. One consequence of the theory is that a changing object instantiating F and then G over an interval that is present, is wholly present while changing, because the times over which the change occurs are present. If we assume for the sake of the argument that a total experience ‘fits’ completely into a *compound present*, an interval constituted by multiple successive times that is wholly present, then Compound Presentism and the extensional theory of temporal perception are fully compatible. That said, the problem is that Compound Presentism is not a coherent idea. I shall present three arguments against Compound Presentism. One about temporal relations, and two about temporal passage.

The first argument against Compound Presentism concerns temporal relations. Standardly A-theories hold that times are successively ordered (instantiating earlier-than and later-than relations), by virtue of having tensed properties (being past, present or future). For the A-theorist, when x is earlier than y, this is *by virtue of the fact* that when y is present, x is past (see 1.2). Let us call this the Tense Principle (TP):

(TP):

For all times x and y, if x is earlier than y, then this is by virtue of the fact that when y is present, x is past.

In Compound Presentism, the Tense Principle does not hold. Consider a Compound Present (CP) constituted by two times: t_3 and t_4 . Standardly, the fact that t_3 is earlier than t_4 is explained by the fact that when t_4 is present, t_3 is past. Here, t_3 and t_4 are both present. Thus t_3 is earlier than t_4 , but this is not explained by (TP). This implies that for the Compound Presentist, A-relations are not more basic than B-relations.³² If tense does not determine temporal order though, then the explanatory role of tense is greatly reduced, as Le Poidevin rightly remarks (cf. 2011a, p.460).

As it stands, the criticism might not be entirely fair to Dainton. On his proposal, the past ‘comes in two forms’: the *real* past and the *unreal* past (2001, p.89). Thus if t_3 and t_4 constitute the present, then t_2 belongs to the unreal past (from here on past-u), and t_3 to the real past (from here on past-r). Here is how Dainton puts it:

More generally, the real past of a time t consists of those earlier times and events that coexist with t in a single extended present, where as the unreal past of t consists of those earlier times that do not co-exist with t (...). (Dainton, *ibid.*)

So on Dainton’s account we can modify the Tensed Principle:

(TP*):

For all times x and y, if x is earlier than y, then this is by virtue of the fact that when y is present, x is either past-r or past-u.

This way, temporal order is still determined by tenses, although by ‘real tenses’: ‘pastness’ and ‘futurity’ within the present. Does this save Compound Presentism? No, because, as I purport to show, past-r is just the tenseless relation ‘earlier-than’ in disguise. TP* only expresses the truism x is earlier than y, by virtue of the fact that x is earlier than y.

Take the difference between past-r and past-u. I argue that ‘past-u’ is a tensed property, but past-r is not. For once, tensed determinations are meant to be incompatible with each other, whereas ‘being past-r’ is not incompatible with being present and being future-r. Consider for

³² Unless the Compound Presentist introduced some other reduction principle from earlier-than relations to tensed determinations, but Dainton does not do that and it is hard to see how.

example a longer compound present CP ($t_3; t_4; t_5$). t_4 is present, past-r of t_3 , and future-r of t_5 . The fact that t_4 instantiates all these properties is not contradictory. In contrast, given a standard A-theory, when t_5 is present, then t_4 is past, which *implies* that t_4 is not present and not future. This shows that being past-r (or future-r) is a fundamentally different property from being past-u (or future-u). If a time is past-u, it is past *simpliciter*. If a time t is past *simpliciter*, then t cannot be also present *simpliciter* or future *simpliciter*. Whether a time is past-r or future-r though, depends on its *position* with respect to other times that constitute the Compound Present. But to say that a time t 's tense-r depends on its position within the Compound Present, is just to say that it depends from when t is judged. t_4 for example, is past-r at t_5 , but future-r at t_3 . That is to say, although past-r and future-r appear *prima facie* to be monadic properties, like ordinary A-properties are, they are in fact *relational* properties that each compound present time instantiates to its co-present times. t_4 instantiates the relational property of being past-r to t_5 and being future-r to t_3 . But this is exactly what distinguished A-properties from tenseless properties: the former are monadic, the latter relational.³³ Whether a time t_4 instantiates the relation 'earlier than' or 'later than' depends on the other time — it is earlier than t_5 but later than t_3 . 'Being earlier than' and 'being later than' are not incompatible properties; neither are 'being past-r' and 'being future-r'. In other words, the property 'being past-r' is nothing else but the property 'being earlier than' in disguise. We are back where we started. It is still the case that given Compound Presentism, temporal order is not determined by the tenses. This undermines the explanatory power of tense in general. The Compound Presentist might just drop the mask and bite the bullet: within the CP, t_3 is irreducibly earlier than t_4 . This does not help though; honesty is a virtue but if it does not solve the problem, then nothing is gained here. We are stuck with the fact that in Compound Presentism, the explanatory link between tenses and temporal order is cut. This makes the role of tense for the theory in general unclear.

Another way to go for the Compound Presentist might be to deny any temporal relations within the Compound Present (CP). Suppose temporal relations held only between intervals, rather than between individual times. That way, the Compound Presentist avoids the

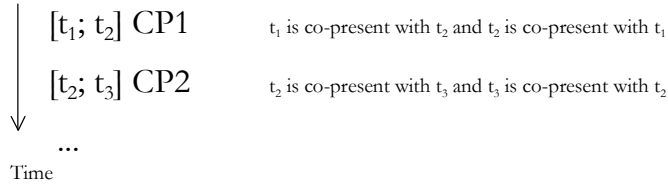
³³ This is not entirely correct given A-eternalism: as I have shown in chapter three, A-eternalists understand A-properties also as relational properties. The difference between A-eternalist properties and B-properties is that the former are instantiated by virtue of standing in a relation to the present time, the latter by virtue of standing in a relation to some other tenseless time. Although t_4 would instantiate pastness-r or futurity-r by virtue of standing in the relation of 'being past-r/future-r of' to some co-present time, it is because that other time is present that t_4 stands in the relevant relation to it. Instead, it is because t_4 is earlier or later than the co-present time.

embarrassment that one time is earlier than another time, without being past when that time is present. Only now, he is confronted with another embarrassment: the present, despite being an interval, becomes *atemporal*. Its constitutive times are neither successive nor simultaneous; together they nevertheless constitute the present. This is neither feasible on a substantialist version of the view, nor on a relationist one. Thinking substantialist, it is barely comprehensible (if at all) to conceive of an interval, such that its constitutive moments are not instantiating temporal relations among themselves. On the relationist picture a CP would be constituted by multiple events or event classes; but if the events (or event classes) are not ordered successively, how can they constitute an interval? Thus, to deny temporal relations within the CP is not a sensible option either. The problem of tenseless relations for Compound Presentism remains acute.

A second problem with Compound Presentism concerns temporal passage. Dainton describes successive CPs as overlapping; first ($t_3; t_4$) is present, then ($t_4; t_5$), then ($t_5; t_6$) and so on. For presentists, temporal passage is the coming into being of times that become present and annihilation of times that become past. Now, consider a CP that lasts over the interval I (t_5-t_{10}). First is I (t_5-t_{10}) present, and then K (t_6-t_{11}). t_5 ceases to be as it becomes past and t_{11} comes into existence as it becomes present. All the times that are located between t_5 and t_{11} though, t_6 , t_7 , t_8 , t_9 and t_{10} , exist when I is present and *continue to be* when I becomes past and K present. As time passes, some times come into existence, others cease to exist, and yet other times just remain 'untouched' by the fact that time passes. One might accuse the Compound Presentist's analysis of temporal passage of inconsistency. At the least one could point towards the reduced role of tense again, as Compound Presentism severs the link between tense and temporal passage.

The third, most severe problem is that Compound Presentism falls prey to a McTaggartian paradox about temporal passage. Standard presentism escapes McTaggart's paradox in that it does not treat presentness as a property in terms of which times change. However, with Compound Presentism, a similar problem to McTaggart's paradox comes back. Consider CP1 ($t_1; t_2$) and CP2 ($t_2; t_3$) and let us call the relation between two present times 'co-presentness'. (See diagram next page).

Diagram 11



Time passes and CP1 goes out of existence as t₁ ceases to exist; CP2 comes into existence as t₂ comes into existence. t₂ is first co-present with t₁, and then co-present with t₃. t₂ changes in terms of co-presentness. t₂'s change from being co-present with t₁ to not being co-present with t₁ requires that t₂ instantiates the property 'being co-present with t₁' and also the property 'not being co-present with t₁'. This predicament is familiar from McTaggart's paradox. There temporal passage required times to instantiate incompatible A-properties. The move that initiates the infinite regress is to say that each time instantiates incompatible A-properties at different times. An analogous move in the case at hand would be to say that t₂ is co-present with t₁ at CP1, but not at CP2. Unfortunately, this move won't help. t₂ is constitutive of CP1 (t₁; t₂) and of CP2 (t₂; t₃). For t₂ to be co-present with t₁ at CP1, is to say that t₂ is co-present with t₁ at t₁ and that t₂ is co-present with t₁ at t₂. This is because CP1 is constituted of t₁ and t₂ and if two things instantiate a relation at CP1, then they instantiate a relation at both times constitutive of CP1, that is, t₁ and t₂. So if t₂ instantiates the relation 'being co-present with' (R_{cp}) to t₁, at CP1, it follows that t₂ instantiates co-presentness with t₁ at t₁ and at t₂:

$$R_{cp}(t_1; t_2) \text{ at CP1} = R_{cp}(t_1; t_2) \text{ at } t_1 \text{ and at } t_2.$$

Similarly, for t₂ not to be co-present with t₁ at CP2 (t₂; t₃), is to say that t₂ is not co-present with t₁ at t₂ and not at t₃:

$$\text{not } (R_{cp}(t_1; t_2) \text{ at CP2}) = \text{not } (R_{cp}(t_1; t_2) \text{ at } t_2 \text{ and at } t_3)$$

But this implies that t₂ is co-present with t₁ at t₂ and that t₂ is not co-present with t₁ at t₃:

$$R_{cp}(t_1; t_2) \text{ at } t_2 \text{ and not } (R_{cp}(t_1; t_2) \text{ at } t_3).$$

The Compound Presentist is forced to invoke higher order times such that t₂ is co-present with t₁ at CP1* (T₁; T₂) and not co-present with t₁ at CP2* (T₂; T₃). However, the problem re-emerges on the higher level. As time passes, T₂ changes from being co-present with T₁ to being not co-present with T₁, which implies that T₂ is and is not co-present with T₁. To escape the contradiction, the change needs to be relativised to different times, and so the regress takes its course. Thus whereas presentism manages to escape the paradox, Compound Presentism opens its door to vicious regress again.

For the three reasons mentioned, Compound Presentism has to be rejected. In the wider context that means that Compound Presentism fails to reconcile the extensional theory of temporal perception with presentism. In the next section I will show that although Simple Presentism might be coherent and even compatible with the extensional theory, both theories together still fail to accommodate perceptual experiences of absolute becoming.

8.5.4 Simple Presentism

My question, to begin with, was whether we could have perceptual experiences of temporal passage if the extensional theory of temporal perception was true. The initial problem was that presentism, the view that can coherently accommodate temporal passage, and the extensional theory are incompatible because the extensional theory requires temporally extended experiential acts, whereas presentism holds that only the present exists, where the present is standardly taken to be instantaneous. As I said before, the idea that the present is instantaneous goes back to an argument by St. Augustine. When introducing that argument (cf. 8.5.4), I said that there are two ways to challenge it. One way is to challenge the premise that any part that is earlier or later than a present part is not itself present, unsuccessfully attempted by Compound Presentism. The other premise that can be challenged is that anything temporally extended has earlier and later parts. If we deny it, then the argument is blocked from the outset. The basic idea is as follows: If the present has duration without having proper temporal parts, that is, if the present time is just one single time with a non-zero duration, then it could theoretically house a total experience of change. I shall call the view that holds that the present is extended without having proper parts,

Simple Presentism. The question that I want to answer is, if the extensional theory and Simple Presentism were true, could we experience temporal passage? I will first introduce Simple Presentism. I defend it in so far as I think it is, by itself, not obviously incoherent. Then I argue that it might even be possible to have experiences of change during a ‘simple present time’, but not of A-change.

The idea that the present time could have duration without having proper temporal parts is closely related to two other theories, *existence monism* and what I shall call *extended atomism* about time. Atomism has its roots in an ancient pre-Socratic doctrine according to which the world is constituted by a finite number of smallest, indivisible, indestructible and unchanging parts, the ‘atoms’.³⁴ Spatial atomism is the doctrine that space is ‘built’ out of a finite number of indivisible spatial atoms. Atomism about time is the view that time has a lowest limit of division, so that the most basic temporal units, the instants, are indivisible. Extended atomism about time, finally, would be the view that the indivisible instants have a non-zero duration without having parts. The view implies that time is divided into finitely many temporal *simples*: shortest units of time that are not divisible and have no proper parts. Its analogue, spatial extended atomism is better known and has been defended before (cf. Braddon-Mitchell and Miller 2006), (Simons 2004). Combine Extended Atomism about time with presentism and we get *Simple Presentism*. Simple presentism is the view that only the present time exists, and that the present time has a non-zero duration without having proper parts. Simple Presentism bears some kinship with *existence monism*. Existence monism is the view that ‘exactly one concrete object token exists (the One)’ (Schaffer 2008). Presentism in general does not support the view that only one concrete object exists (although the number of objects is restricted to the present ones). What affiliates Simple Presentism with existence monism though is the idea that time (or space-time) could be extended without having parts, that is without multiple instants (spatiotemporal points).³⁵ Existence monism is contemporarily supported by Horgan and Potrč (cf. Schaffer, *ibid.*). According to them,

³⁴ Atoms must be understood in a philosophical sense, as indivisible, smallest entities. They should not be confused with atoms as known from the natural sciences. Atomism was first defended among others by Democritus and Leucippus in response to Parmenides’ argument about the impossibility of change and Zeno’s paradox (cf. Berryman 2010).

³⁵ Existence monism does not have to defend that there is only one space-time (that there are not many spatiotemporal points) but it makes room for such an option (cf. Schaffer 2008)).

[t]here really is just one concrete particular, viz. the whole universe (the *blobject*).

The blobject has enormous spatiotemporal complexity, and enormous local variability — *even though it does not have any genuine parts.* (Horgan and Potrč 2000, p.249), my italics.

They claim that such a theory is a

coherent ontological framework for physics, especially if one focuses on broadly field-theoretic formulations of physical theory. The ontological framework construes the entire cosmos as a physical field, which, although it certainly exhibits local variation, does not really have parts. (Horgan and Potrč 2000, p.252)

Bennett (1984) and Rea (2001) also show some sympathy for existence monism, in agreeing with Horgan and Potrč at least in the point that existence monism is a coherent metaphysical view (cf. Schaffer 2008). If existence monism about space-time is possible, then so is extended atomism about time. If extended atomism about time is possible, and presentism too, then Simple Presentism must also be possible. According to Simple Presentism, the present is not instantaneous, it has duration, but in contrast to Compound Presentism, it is constituted by only one single, temporally extended time.

Now, the motivation for this section is to find out whether there is a coherent form of presentism which is compatible with the extensional theory of temporal perception. If so, then the supporter of the Argument from Experience would be one step further in defending the view that we have perceptual experiences of temporal passage. Let us accept, for the sake of the argument, that Simple Presentism is metaphysically coherent and possible. By itself, this does not suffice to ensure that the view is compatible with the extensional theory of temporal perception. To be fully compatible with the extensional theory, Simple Presentism must allow for change to occur *within* the present. How to account for change that occurs at the present time? Usually, objects with temporal parts change by having qualitatively different temporal parts, and objects without temporal parts change by instantiating different properties at different times. If the object is supposed to change during the simple present, it cannot change in either of these ways. First of all, an object that is wholly located within the extended simple present must be an *extended simple* itself. Objects within the Simple Present cannot have multiple temporal parts, for to have a temporal part is to have a part that is located at a time. Therefore, if the object is

temporally extended but only located at one time, it must be temporally extended without having temporal parts: it must itself be an extended simple, an extended object that has no proper parts. As such it cannot change by virtue of having different temporal parts.³⁶ Temporal simples are objects that persist, or endure, without having temporal parts.³⁷ Enduring objects change by instantiating different properties at *different times*. An object that endures over a simple present cannot change within the simple present by instantiating different properties at different times, for it is only located at one time. The problem is that any account of change that involves a reference to different times will not work if the subject of change is supposed to be located at a *single* time. For Simple Presentism and the extensional theory to be compatible, we need simple objects that are wholly present, while still exhibiting qualitative heterogeneity.³⁸ In other words, for the extensional theory to be compatible with Simple Presentism, we need an account of change that does not involve reference to different times.

To make things more graphic, imagine a rabbit named Olaf. For the presentist, all parts of Olaf are wholly present, and for the Simple Presentist, Olaf is wholly present over an interval which is the present. Neither Olaf nor the time at which he is located have temporal parts, however, during the interval that is the present, Olaf changes from being thin to being fat. If Olaf is to change during the Simple Present, then we cannot say that Olaf is fat at t_1 and thin at t_2 , where t_1 and t_2 are constitutive of the interval occupied by Olaf. Compare the two diagrams on the next page:

³⁶ One might add that an object could have a non-proper part that is identical to itself located at the Simple Present.

³⁷ Temporal simples are thus much less controversial than spatial simples. Spatial simples have been defended among others by Braddon-Mitchell (2006), McDaniel (2007, 2009), Parsons (2004) Simons (2004) and Spencer (2010). Endurantists include Chisholm (1976b), Geach (1967), Haslanger (1989), Lowe (1998), Mellor (1981), Thomson (1965) and van Inwagen (1990a, 1990b).

³⁸ Note that a wholly present, extensional total experience of change would be one such object: by representing change it would itself be qualitatively heterogeneous.

Diagram 12

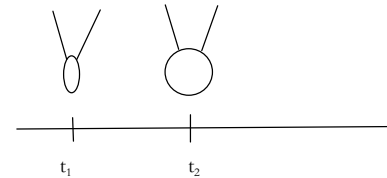


Diagram 12 shows change as standardly understood: Olaf is thin t_1 and fat at t_2 .

Diagram 13:

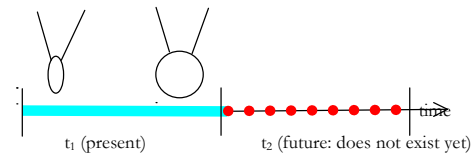


Diagram 13 shows change in the Simple Present: t_1 is the present time during which Olaf changes from thin to fat.

The idea of a simple object changing during a simple time is hard to digest. Intuitively at least, most of us find the idea compelling that qualitative heterogeneity over time, as Olaf exhibits it by being thin and then fat, must involve successive times at which Olaf is thin and fat. Recently Parsons has presented an account of change that does not involve reference to different times (2004).³⁹ Parsons' account of change crucially involves *distributional properties*. Distributional properties are intrinsic properties that describe some kind of qualitative distribution over a region of space or time, such as the property 'being striped', or, in the temporal case, 'beginning hot and ending cold'. Here is how Parsons introduces them:

Distributional properties are perfectly simple and straightforward. Let me give some examples.

Being polka-dotted is an example of a colour-distributional property — the property a surface has

³⁹ Spencer discusses Parson's account of change for simples being located at simple times (Spencer 2010).

when it has the right kind of colour distribution. Being hot at one end and cold at the other is an example of a heat-distributional property. (...)

Intuitively, (...), a distributional property is like a way of painting, or filling in, a spatially [or temporally] extended object with some property such as colour, or heat, or density.

(Parsons 2004, p.173), square bracket my addition.

Parsons distinguishes between *uniform* and *non-uniform* distributional qualities. If Olaf the rabbit stays fat for the entirety of his life, then he would instantiate the uniform distributional property of ‘beginning fat and ending fat’. If he gains weight over the course of his life though, then the distributional property would not be uniform: Olaf then instantiates the property beginning thin and ending fat. Change, for Parsons, is the instantiation of a non-uniform distributional property:

I propose that an object *changes* iff it has a non-uniform temporal distributional property. More specifically, an object changes in a respect ϕ (where ϕ might be “heat”, or “mass”, or “believing in the Hegelian Dialectic”) iff it has a non-uniform temporal ϕ -distribution. (Parsons 2004, p.180)

And Spencer adds

When [distributional properties] are exemplified, we need not to appeal to proper subregions of the regions occupied by those objects to explain distributions of [non-distributional properties]. (Spencer 2010, p.172)

Uniform and non-uniform distributional properties can be instantiated without reference to different times, while an object that instantiates a non-uniform distributional property is an object that changes. This makes the distributional account of change perfectly suited to explain change within the simple present. In a Simple Presentist world, Olaf changes with respect to his mass, if and only if Olaf has a non-uniform temporal mass distribution over the duration that is the Simple Present.

With reference to the distributional account of change, Simple Presentism can account for wholly present total experiences of change. A Simple Presentist could say that a total experience Ex changes in a respect ϕ , where ϕ is some respect in which the object of experience is

represented to change, if Ex has a non-uniform temporal ϕ distribution over the duration that is the Simple Present.

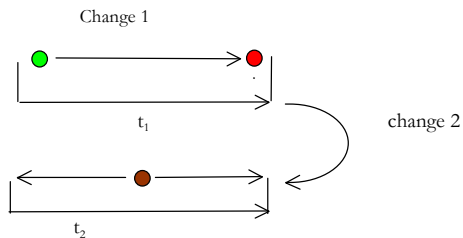
I won’t deny that there are several worries that one might have with distributional properties or this account of change. Parsons’ account relies on the plausibility of irreducible distributional properties. Sceptics might say that a distributional property like being fat-then-thin can always be reduced to being fat at one time and thin at another time (cf. Parsons 2004, p.176 pp). If this was the case, then the distributional account of change is no help for the Simple Presentist who wants to account for the experience of change. Another worry relates to the ‘coarse-grainedness’ of distributional properties. Take the property ‘red-and-white polka dotted’ — it is too coarse-grained to distinguish between differently red-and-white polka-dotted objects. Similarly we cannot distinguish between rabbit Olaf being thin only for the beginning of the present interval and fat ever after, and rabbit Heinz, who is just as long thin as he is after that fat. Both would instantiate the property thin-then-fat. A third worry might relate to the problem that it might not always be clear whether a property is uniform or not. (Parsons gives the example ‘beginning grue and ending bleen’ (Parsons 2004, p.180)). While these may be legitimate concerns, I won’t discuss them here as, again, it would take me too far from my focus.⁴⁰ It suffices to say that the adherent of distributional properties must have plausible answers to each of these worries. For the moment I shall assume that he has. The focus here is after all on the question whether we could experience the change that constitutes temporal passage, assuming the extensional theory and Simple Presentism were true. The worries related to the distributional account itself are not too relevant in this enquiry, for I will argue that, even if objects could change while being wholly located in the simple present, we still could not experience the change that constitutes temporal passage.

To begin with, it should be noted that if change was possible within the simple present time, this would have the strange consequence that there would be two entirely different kinds of change: change within the present, and change ‘between’ the present times. Within the present, change would have to be analysed as instantiation of a non-uniform distributional property. As time goes by, however, times come into and go out of existence, thus for objects that change slower, that is, where the change occurs over different times, change would have to be analysed

⁴⁰ For discussion see Parsons(2004), McDaniel (2009) and Spencer (2010).

in terms of absolute becoming. Imagine an apple changing during the present from green to red, by instantiating the non-uniform distributional property 'beginning green and ending red', and then changing to brown from one time to the other. The latter change must be analysed in terms of absolute becoming, such that the first event, 'apple instantiating distributional property F' ceases to exist and the second event, 'apple instantiating distributional property G (where G might be uniform or non-uniform) comes into existence.

Diagram 14



Change 1: Apple instantiates the non-uniform distributional property 'beginning green, ending red' at the present time t_1 .

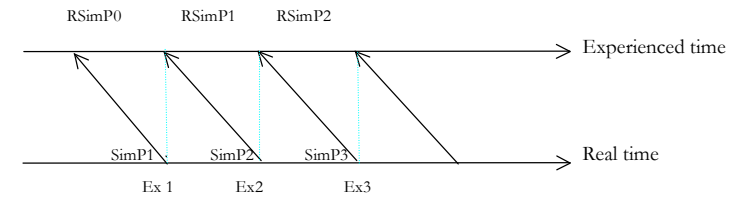
Change 2: The event 'apple instantiating 'beginning green, ending red'' ceases to exist, the event 'apple instantiating uniform brownness' comes into existence as t_1 ceases to exist and t_2 comes into existence.

Surely a metaphysical theory which analyses the same phenomenon, qualitative change, in two entirely different ways, thereby stipulating two kinds of change, is not desirable.

A second, more pressing worry in the context at hand is this. If one's experience is wholly encapsulated in the present, then how could we experience the coming into and going out of existence of successive present times? The worry here is not that the object of experience needs to be present. Only the experiential act needs to be present, not what is represented by the experience. That said, whatever is experienced, must have occurred during a present time. Given that (i) the experiential act and what is represented need to have the same duration (extensional theory), and (ii) the experiential act must not exceed the present (presentism), whatever is represented in experience is confined to the duration of a present time. Thus we are constrained to experience what occurred *within* a previous present time. This prevents us from ever

experiencing the change that constitutes passage, which is a change *from one time to the other*, rather than a change that occurs during a present time. Given the extensional theory and simple presentism, an experiential representation of absolute becoming is thus impossible. Let me illustrate the problem with a diagram⁴¹:

Diagram 15



Each total experience (Ex) occurs during a Simple Present (SimP) and represents a past Simple Present (RSimP). It is not possible to experientially represent the change of what is present.

The problem is based in the way Simple Presentism construes passage. In Compound Presentism times cease to exist and come into existence part by part. According to simple presentism, times are extended without having parts. Thus when time goes by, then it is always the entire extended present duration that ceases to exist or comes into existence *as a whole*, that is in temporally extended 'chunks'. As our experiences are confined to those chunks, we can never be aware of changes between chunks.

What this shows is first of all that we could not have veridical experiences of A-change, for A-change does not occur during the Simple Present. The argument can be strengthened: not only can we not perceive A-change, we cannot have illusions or hallucinations of it either. To have an illusory experience as of A-change, a subject S would have to (mis-)represent another kind of change as A-change. During the simple present, changes are instantiations of non-uniform distributional properties. Thus, given the view at hand, S would have to visually represent a non-uniform distributional property as change that occurs when things come into and go out of existence. It is hard to see how S could visually represent a single distributional property as A-change. We are confronted with a similar phenomenal paradox as with the retentional theory. When Olaf presently instantiates 'beginning thin, ending fat', for example, this

⁴¹ The Simple Present (SimP) and the represented Simple Present (RSimP) are supposed to have the same length.

implies that Olaf is not thin at the end of the Simple Present. The only way to visually represent this is by representing Olaf as thin and then fat. But this does not suffice to represent the change as A-change. To represent Olaf's change as A-change, S would have to visually represent that the complex 'Olaf is thin' exists at the beginning of the present, and then "no-when", which implies a representation of Olaf being thin at the beginning of the simple present and of Olaf not being thin at the beginning of the simple present. It comes at no surprise that it is impossible for us to perceptually represent change as A-change during the simple present. I conclude that, even if the extensional theory was compatible with Simple Presentism, we could not have perceptual experiences (as) of A-change, and thus not of temporal passage.

I have argued that both realist accounts of temporal perception do not allow for a visual representation of A-change. In the last section, I shall consider two objections to my argument.

8.6 A-change as 'high level property' and 'present as absent representation' of temporal passage: reply to two objections

I have argued that for the Argument from Experience, AFE, to work, we would have to perceptually represent temporal passage as the absolute becoming of events, or A-change, change as it would be if time passed. Moreover, I said that to infer anything from that experience, A-change would have to be phenomenally distinguishable from B-change, change as it would be if time did not pass. I then went on to show though, that even if it was possible to have experiences of A-change, A-change would look the same as B-change.

In reply, my opponents might argue as follows.

- (i) Your argument seems to tacitly assume that we can only represent certain kinds of properties in experience.
- (ii) It is not clear that we would have to perceptually represent anything quite so complicated as absolute becoming in order to experience temporal passage. We might even admit that temporal passage is not *visible*, in the sense that colours and shapes are visible. However, it is still evident to us that temporal passage is phenomenally present in *some* way, although in a different way than colours and shapes. If that is so, then temporal passage

makes a difference to the phenomenology of experience and thus also to the content of the experience, that is, the way the represented scene is characterized by the experience.

Therefore, to deny that temporal passage is represented in experience (as temporal passage), is to make premature assumptions about what kind of things can be represented in experience and in what way.

I understand these objections to refer to two debates in the philosophy of perception. Firstly, the debate about what kind of properties can be represented in experience. Most philosophers accept that we have the ability to represent *low level-properties* such as colours, shapes, size and position in visual experience. The opinions differ however whether we can experience more complex *high-level properties*. High-level properties include properties such as natural kind properties, semantic properties, causal properties and the property of being a specific individual ('your mother'). There is an ongoing debate about whether we can represent high-level properties in experience and, if so, which ones.⁴²

The second debate this objection relates to concerns the way things are represented in experience. According to some philosophers, there are two ways of representing things in experience:

- (i) as phenomenally present
- (ii) as phenomenally present as absent⁴³

Roughly speaking, the idea is that to be phenomenally present is to be represented in the same way as colours and shapes are represented in experience. To be *phenomenally present as absent* is to be represented in some different way. The distinction is best illustrated with an example. According to Noë's view (2009) when we are having an experience as of a tomato, for example, we do not only experience its visible properties, such as its colour, the shape of the side facing towards us, the evenness of its skin and so forth. We may also have an experience as of the backside of the tomato, the side that is *not visible* to us. Noë claims that

⁴² See for example Siegel (2005, 2006, 2007, 2009, 2010b). For a comprehensive anthology on this topic see Macpherson (2011).

⁴³ For discussion of presence as absence see Noë (2009) and Macpherson (forthcoming). The same idea is sometimes put in terms of 'non-sensorial' or 'amodal' experience, cf. (Briscoe 2011) and (Nanay 2010).

vision is not confined to the visible. We visually experience what is out of view, what is hidden or occluded...For example, you look at a tomato. You have a sense of its presence as a whole, even though the back of the tomato (for example) is hidden from view. You do not merely think that the tomato has a back, or judge or infer that it is there. You have a sense, a visual sense, of its presence. (Noë 2009, p.470-1)

The alleged experience of the backside of the tomato is, according to Noë, a present as absent-representation. The backside is phenomenally represented, but in a different way from the tomato's colour or the shape of its front side. You do not see it, but you have a 'visual sense' of it. Other supposed examples of present as absent-representation include representations of absences or empty spaces.

Now, coming back to temporal passage, as I understand the first objection my opponents might accuse me of tacitly assuming that temporal passage properties (such as for example the property of 'being an A-change') are high-level properties and that we cannot represent high-level properties in experience. With the second objection they might accuse me of rejecting or ignoring present as absent representation in experience, or of disregarding the option that temporal passage might be represented in that way. All of these accusations are false. Whether temporal passage properties are high level properties or not is not my battleground; nothing in my argument depends on those properties being high-level rather than low-level. That is to say, the argument works, even under the assumption that passage properties are low-level properties. My argument does not rely on the rejection of presence as absence representation either. For even if passage was experientially represented in a present as absent way, this would not help the defender of AfE (the Argument from Experience). This is because a) there is, in such a case, no way to tell whether passage is really represented in experience or whether we believe that time passes on the basis of experience and b) even if we had experiences of present as absent passage, such an experience would not be best explained by the fact that time passes. Let me explain.

The opponent's argument might be formulated as follows:

'Present as Absent Passage' (PAP)

Temporal passage may not be visible in the sense that colours and shapes are, but we experientially represent it in a present as absent way. As such, passage makes a difference to the phenomenal character and thus to the content of the experience. The best explanation for these experiences of passage is that time passes. Therefore time passes.

This argument does not work for two reasons. Firstly, if passage is not visible, how can the subject tell that it is part of the experiential content rather than a belief about what is represented in experience? Introspection is not a good guide, for, as Siegel explains, introspection is just not precise enough to decide whether we experience *x* or merely believe that we do (cf. Siegel 2007). Siegel suggests a different method, the 'method of phenomenal contrast'. The method of phenomenal contrast is designed to determine whether or not some property is represented in experience whenever it is too difficult to decide this by merely introspecting the experience itself. The idea is to find two experiences that do not differ with respect to the low-level properties they represent, but which nevertheless display a difference in phenomenology. Here is her example:

Suppose you have never seen a pine tree before, and are hired to cut down all the pine trees in a grove containing trees of many different sorts. Someone points out to you which trees are pine trees. Some weeks pass, and your disposition to distinguish the pine trees from the others improves. Eventually, you can spot the pine trees immediately: they become visually salient to you. Like the recognitional disposition you gain, the salience of the trees emerges gradually. Gaining this recognitional disposition is reflected in a phenomenological difference between the visual experiences had before and after the recognitional disposition was fully developed. (Siegel 2006, p.491)

According to Siegel, if two cases of this sort can be found, then the phenomenological difference between them is best explained by a difference in content with respect to some high-level property. In her example, the difference between what it is like to see a pine tree before you learn how pine trees look like and what it is like to see one after, is supposed to be best explained by a difference in content: one experience does and one does not represent that there is a *pine* tree. The properties Siegel refers to are high-level properties, but if the method works, then it must be equally applicable for properties that are not represented in a phenomenally present

way.⁴⁴ This is relevant because I want to be neutral with regards to the question whether passage properties are low-level or high-level. My point is that passage is not experientially represented in the same way as colours and shapes are, so now the question is whether passage could be experientially represented in some other, present as absent way. Concentrating on the phenomenally present/present as absent distinction, rather than on the high-level/low-level distinction, the method of phenomenal contrast could be described as follows: find two experiences that do not differ with respect to the properties represented as phenomenally present, but that nevertheless differ in terms of their phenomenology. If they differ in terms of phenomenal character, then they must differ in terms of content. The difference cannot be explained by the properties that are represented as phenomenally present, thus it must be explained in terms of a property that is, in one of the two cases, represented as present as absent. Apply this to temporal passage. If my opponent could find two experiences of change that do not differ with respect to the properties represented in a phenomenally present way, but which differ nevertheless in their phenomenology (one change seems to ‘flow’, the other not), then this is best explained by the fact that one experience represents passage and the other not. This is not the place to assess the method of phenomenal contrast in general. But, assuming that it works, the problem here is that it is not applicable to temporal passage. There are simply no contrast cases to compare. If time passes, then all changes are A-changes. If time does not pass, then all changes are B-changes. Given that introspection does not work, and the method of phenomenal contrast is not applicable either, we have just no way of telling whether passage is experientially represented in a phenomenally present as absent kind of way. In short, even if passage was experienced in this way, we could not know about it.

A second problem for (PAP) has to do with the way we could come to represent passage in a present as absent way in perceptual experience. One plausible explanation for how we might come to experience passage in that way might be that we are simply “hard-wired” to experience passage. In other words, the visual system might be organized such that it experientially represents passage (in a present as absent way) whenever we experience change. If this was the

⁴⁴ It is open to the supporter of high-level properties in experience to say that these properties are represented as phenomenally present, or as phenomenally present as absent. In many cases it seems plausible, however, that high-level properties are not represented in the same way as low-level properties. In those cases high-level properties might be experientially represented as present as absent. On the other hand, there might be low-level properties that are represented as present as absent, such as for example the shape of the backside of the apple. As I understand it, the method of phenomenal contrast works for all properties that are not straightforwardly phenomenally present in experience.

case though, then it is dubious whether our experiences would be best explained by the fact that time passes. In standard cases of perceptual experience a subject’s perceptual experience that *p* is best explained by the fact that *p*, because (non-hallucinatory) experiences are *caused* by stimuli from the environment and it is a better explanation to say that we represent the environment correctly in experience than not. However, if the brain was constituted in such a way that we could not but experience time as passing, then that experience would not be best explained by the fact that time passes. If our brains were built such they experientially represent temporal passage, then these experiences would tell more about us than they tell us about the world.

That said, one might argue that we evolved to have a brain that is hard-wired to experience temporal passage because time passes. In that case, temporal passage would still be the best explanation for our (present as absent) experiences of passage, because passage would explain why we could not but experience temporal passage. Let us carefully think through what that would mean though. It would mean that at some point during our evolution we adapted to the fact that time passes by developing a brain that is structured to experience temporal passage. If we adapted in that way, then the ability to experience temporal passage must have been some evolutionary advantage. In other words, for it to be plausible that we have developed such that our brains are hard-wired to experience passage because time passes, such a development must have had some advantage for survival if it was to persist. So far so good. The question is what kind of evolutionary advantage could it be to experience temporal passage? One might think that one advantage that could be gained by the ability to experience passage is the ability to experience ordinary change. However, I have argued that if we were not aware of passage, we would still be aware of qualitative change (of change as B-change). Secondly, one might think that for a subject *S* to be perceptually aware of the fact that time passes would be for *S* to be perceptually aware of the fact that the past does not exist anymore and the future not yet. Maybe such an awareness could be an evolutionary advantage if it prevented a subject from confusing what happens (more or less) at the time of the experience with what has happened before (or will happen after). This is very unlikely though. Given that we have different forms of epistemic access to what happens at the time of our experiences and to what happened before or will happen after, and that we are able to distinguish memories, expectations and perceptual experiences “from within”, there is very little danger to confuse what happens now with any other time, even if we do not experience temporal passage. It follows that the evolutionary

advantage that we could have gained by developing brains that are hard-wired to experience passage is unclear. Such an advantage is however needed to support the idea that we might have *adapted* to the fact that time passes by developing brains that are hard-wired to experience passage.

Another possible explanation for how we could experientially represent passage in a present as absent sort of way might be by a process called *cognitive penetration*.⁴⁵ Cognitive penetration of a visual experience *Ex* occurs if the representational content and phenomenal character of *Ex* are altered by the subject's other cognitive states (beliefs, concepts, desires, emotions). Importantly, this does not involve cases where these cognitive states affect the subject's visual attention. For example, we do not have a case of cognitive penetration if my aversion to spiders causes me to turn away from the one I am looking at, resulting in a different visual experience (one that does not represent the spider). If cognitive penetration is possible, then it should be possible for two subjects to attend in the same way, and under the very same conditions, to the same object, while having different visual experiences due to different cognitive structures. Applying this to temporal passage, the idea would be that a subject *S*'s visual experience of change could be altered by some cognitive state such that *S* would visually represent temporal passage in a present as absent way. One might for example believe that time passes, and this belief might then penetrate one's visual experience of change, such that the experience then represents temporal passage. Or one might have acquired the concept of temporal passage, and one's visual experience might be penetrated by that concept, with the result that one comes to represent temporal passage. That said, a cognitively penetrated experience of passage would not help the defender of AfE either, for it would not be best explained by the fact that time passes either. If the experience is altered such that we come to visually represent passage only due to the penetration of the experience by some belief or concept, then clearly the best explanation for the experience is not that time passes, but the belief that time passes, or the (possession of) the concept of temporal passage, and the fact that the experience has been penetrated by it.

As seen before, one might counter that we evolved to believe that time passes or acquired the concept of temporal passage because time passes. In that case, any temporal passage experience penetrated by such belief or concept would still be best explained by the fact that

⁴⁵ For general discussions about cognitive penetration see Macpherson (2012), Pylyshyn (1999) and Siegel (2011).

time passes. As with the case before though, I doubt that we could have evolved in that way. If it were the case that we developed brains hard-wired to believe that time passes *because time passes*, then believing that time passes must have been some advantage for survival. Analogously, if we acquired the concept of temporal passage as an adaptive response to the fact that time passes, then the possession of such a concept would have to be an advantage over not possessing such a concept. But for the reasons mentioned before, it is unclear what that advantage could be. In brief, it is highly implausible to think that we adapted to temporal passage by having evolved brains hard-wired to experience or believe that time passes, or to have the concept of temporal passage. I conclude that a "hard-wired experience" or cognitively penetrated experience of temporal passage would not be best explained by the fact that time passes.

In this chapter I have pursued the question whether we could have perceptual experiences as of absolute becoming, or *A-change*, the change that constitutes temporal passage. I have argued that for AfE to go through, we would need to experience *A-change* as *A-change*. I then argued that none of the standard theories of change perception can accommodate such experiences. Memory theories deny that we can have perceptual experiences of change in general. Given the retentional theory, we could not perceptually represent *A-change* as *A-change* — in other words, even if we did perceive *A-change*, the change would look the same as *B-change*. The extensional theory on the other hand is metaphysically incompatible with presentism, the theory of time that can accommodate temporal passage. The reason is that on the extensional theory experiential acts are supposed to be temporally extended, whereas presentism only allows for things that are wholly present, where the present is standardly supposed to be instantaneous. Denying that the present is instantaneous results in two non-standard forms of presentism: Compound Presentism and Simple Presentism. At first glance, these theories appear to be compatible with the extensional theory of perception, but they cannot help the AfE theorist either. Compound Presentism is intrinsically incoherent. Among other problems, it falls prey to a version of McTaggart's argument. Given Simple Presentism we could not experience *A-change* because we could only experience what occurs during a simple present, where *A-change* would have to be change of successive simple presents. It follows that there is no major account of temporal perception that allows for experiences of *A-change* in such a way that we could infer from these experiences that time passes. Finally I discussed two objections against my argument. The first objection accuses me of implicitly assuming that temporal passage properties are high-level properties and that we cannot experience high-level

properties. I deny this and point out that my argument does not rely on these assumptions. The second objection is that temporal passage need not be visible in visual experience in order to be represented by that experience. It might be experientially represented in a 'phenomenally present as absent' sort of way. Two psychological mechanisms might explain this sort of representation. We might be 'hard-wired' to experientially represent temporal passage or the perceptual experience might be cognitively penetrated by the belief (concept) that time passes and thereby altered such that it represents passage. My reply is that firstly, we could not know whether we perceptually represent passage in a present-as-absent kind of way and that, secondly, the resulting experiences would in any case not be best explained by the fact that time passes. I conclude that we cannot infer that time passes from experience, because on none of the leading accounts of temporal perception we could perceptually experience Λ -change as Λ -change. Therefore the Argument from Experience fails.

Conclusion

My thesis brings two clear results. Firstly, that Λ -eternalism is incoherent and that the notion of temporal passage can only be analysed in terms of absolute becoming. Secondly, that we cannot experience temporal passage in a way that allows us to infer that time really passes. Now, what does this mean for the debate about temporal passage? While these results do not resolve the conflict between dynamic and static theories, they show which arguments do not work. The static theorist cannot just dismiss the notion of temporal passage as incoherent. The dynamic theorist, on the other hand, has to abandon the idea that her theory has intuitive support from experience and thus an advantage over the static theory of time. Although we cannot perceptually experience temporal passage, it is indisputable that we are all, intuitively and pre-philosophically, disposed to believe that time passes when we experience change. One question I have not been able to address is how and why this belief is generated. An indirect response is implied in my argument against the experience of passage: prior to reflection, we tend to confuse the experience of qualitative change with the experience of temporal passage (and we standardly believe what we experience to be the case). This is of course only part of the answer. Why is it, one might further ask, that we think that time passes when we experience change? A deeper more thorough analysis that would do justice to the depth of this issue is a thesis in itself. I can only tentatively point to some directions worthwhile exploring in another project. One promising explanatory approach concerns the difference between our experience of time and our experience of space. Our temporal and spatial perspective on the world is confined to what happens more or less around us at the time of our experience. But whereas we can (within physical limits) freely change our spatial perspective, the temporal perspectives we take are in some way "forced upon us". We can choose to move in all three spatial dimensions, or we can remain at the same place.¹ In contrast, we cannot move back through time or remain still at the very same time. Even B-theorists agree that there seems to be a temporal directedness in physical processes that determines the temporal order in which these processes, including our own experiences, occur. How this directedness can be explained is subject to another long standing debate, where some people want to explain this directedness with the direction of increasing

¹ Even if we were paralysed, we would still be potentially able to move in space in a way that we cannot move in time.

entropy, others with the direction of causality.² Others again, like Dainton, appeal to irreducible pheno-temporal patterns of experiences and an asymmetry with regards to time in the experiential contents. The idea is that, whether or not time passes, each individual experience appears to 'extrude itself forward into the future' (Dainton 2000). Whether or not these explanations prove to be fruitful is a question for another time. The point I am making is merely that we do not need to appeal to temporal passage in order to explain the differences between experiencing time and experiencing space.

Apart from the question about how we come to believe that time passes, there are still other avenues to explore, which I could not do in this thesis. When one explores fairly new argumentative territory, as I have done in the second part of this thesis, it is not surprising that one ends up with some loose threads and ends. I was for example forced to restrict myself to three major theories of temporal perception and could only briefly evaluate those theories in their own right. Furthermore, I had no space to show that my argument also works given a non-representational account of perception, or that it works for other perceptual modalities apart from sight, although I suspect that it would not make a difference to my argument. It would also be interesting to see whether there can be a definitive answer to the question whether temporal passage is coherent on a growing block theory of time, and whether this would make any difference with regards to the Argument from Experience. When we think about such a profound and difficult matter as time and temporal experience it is only to be expected that there are always more questions that need to be answered. I hope to have shown that there is more than enough reason to continue the important debate between static and dynamic theories of time.

² For discussion about the asymmetry of time see for example Arntzenius (1997), Callender (1997) and Savitt (1996).

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Thesis Summary

My thesis is about the metaphysics and the experience of temporal passage. In the first part I argue that temporal passage is a coherent notion, provided that we understand it in terms of absolute becoming, the coming into and going out of existence of times. In the second part I argue that we cannot infer that time passes from experience.

PART I: The Metaphysics of Temporal Passage

CHAPTER ONE sets up the distinction between dynamic theories of time, theories that defend the view that time passes, and static theories of time, which deny that time passes. I introduce the standard terminology used in the metaphysics of time and then argue that the ‘dynamic versus static debate’ should not be conflated with other debates in the philosophy of time. More precisely, I say that the dynamic versus static debate should be distinguished from the following major debates in the philosophy of time: the ‘A- versus B-theory debate’, the ‘tense-realism versus tense-antirealism debate’, ‘eternalist versus non-eternalist debate’ and the ‘tenser versus detenser debate’. Temporal passage in the relevant sense I am interested in must be a change of reality. While the B-theory and tense-antirealism (which are, as it turns out, equivalent) cannot accommodate temporal passage in the relevant sense, there are (at least *prima facie* possible) versions of dynamic and static A-theories, and dynamic and static tense realist theories. The same is true for eternalist and non-eternalist theories of time, where static and dynamic versions are possible on each side. I then argue that the tensor versus detenser debate is orthogonal to the debate about temporal passage. I end the first chapter with a brief preliminary overview of various accounts of temporal passage. The overview reveals that all theories of temporal passage construe passage either as change in A-properties, or as change of what (actually) exists.

CHAPTER TWO is the first of three chapters dedicated to McTaggart’s argument against time and temporal passage (1927, p.18 pp.; 1908). I argue that McTaggart’s argument is based on an A-eternalist conception of time, according to which all times exist as ontologically ‘on a par’, but nevertheless tensed, by which I mean that times are conceived as future, present or past. McTaggart assumes that there could not be time without change, while insisting that “real”

change must be more than just qualitative variation in time. From this he infers that change must concern every single term in the time-series, but that the only respect in which a single term can change, is with respect to its A-properties. According to McTaggart, the change that terms undergo with respect to their A-properties is what constitutes temporal passage. I call this change ‘Genuine Change’.

CHAPTER THREE comprises my reconstruction of McTaggart’s paradox of temporal passage. I argue that the paradox is best understood as the problem of Genuine Change, construed as a special case of the general problem of change. The problem of change requires a subject to instantiate incompatible properties, which must then be, on pain of contradiction, somehow indexed to different times. Analogously, the problem of Genuine Change requires its subjects (each term in the time-series) to instantiate incompatible A-properties, which must be indexed to different times to avoid contradiction. In the case of Genuine Change, I show that the indexing to different times can only be done by construing A-properties as relational properties and Genuine Change as relational change. I then defend the view that temporal passage, such construed, leads into a regress where every term’s relational change occurs in virtue of another term’s relational change. I argue against Smith (1986) that the regress is vicious, because it starts off with a problem, which is such that the solution to the problem generates the same kind of problem. I then discuss a second objection to the paradox, which depends on the view that every relational change ultimately depends on a non-relational change. The objection is that the regress is not vicious because a suitable non-relational change can be found. I argue that even if one supports the view on relational changes in general, the solution does not work because the only suitable non-relational change leads into a new regress involving infinitely many time-series. I conclude that McTaggart’s paradox argument works, provided we accept his notion of temporal passage.

In CHAPTER FOUR I present four frequently found objections to McTaggart’s argument. I argue that all of them fail. Some of them concentrate on the idea that McTaggart’s paradox is committed to events that change, while holding that events cannot change or do not exist at all. I point out that according to McTaggart, Genuine Change is a unique kind of change, precisely because events can undergo it. I also show that McTaggart’s argument does not rely on the existence of events. Other objections argue that there is no initial contradiction in McTaggart’s

premises because they are either ambiguous or ill formed. However, alternative understandings either fail to remove the contradiction or fail to express temporal passage.

CHAPTER FIVE explores other ways to reject McTaggart's argument. I argue that the best way is to reject A-eternalism and the idea that passage is Genuine Change. When we instead think of passage as absolute becoming, defined as coming into existence *simpliciter* and going out of existence *simpliciter* to be real and/or ceasing to be real, there cannot be any problem of change in the first place. The proposal does however depend on the assumption that absolute becoming is a change *of* time, rather than a change that occurs itself *in* time. This is most plausible if we think of absolute becoming as involving a replacement of one time-series by another time-series. I show that presentism can naturally accommodate this understanding of absolute becoming and propose a formulation of temporal passage on the basis of presentism. Finally I argue that whether temporal passage is coherent on the growing block view depends on other philosophical convictions and that it is not clear whether the growing block theory escapes McTaggart's paradox. The lesson to learn from McTaggart is that, if one supports the view that time passes, then one should be a presentist.

PART II: The Experience of Temporal Passage

In CHAPTER SIX I show that the intuition that we can come to know that time passes through experience is frequently used by dynamic theorists to motivate and support their thesis. I introduce the argument behind that intuition, which I call with Le Poidevin (2007) the Argument from Experience (AfE)¹. Briefly put, the argument takes it for granted that we experience temporal passage, and that the best explanation for this is that time really passes. With an inference to the best explanation, the defender of temporal passage then concludes that time really passes. I present three possible objections to AfE. One objection denies the principle from the inference to the best explanation. I dismiss it. The second objection denies that we have experiences as of temporal passage. The last objection argues that one's experiences of temporal passage are not best explained by the fact that time passes. I specify three types of passage experiences that would not be best explained by the fact that time passes. Firstly, illusions of temporal passage. Secondly, veridical experiences of temporal passage which are partially caused by other (non-experiential) mental states of the subject. Thirdly, experiences that are such that

¹ My version of the argument differs from Le Poidevin's though.

their content does not entail that time passes. I then argue that the best strategy against AfE is to determine which experience would be best explained by the fact that time passes, and then deny that we can have these experiences.

CHAPTER SEVEN determines what kind of experience would be best explained by the fact that time passes. I argue that the defender of AfE must understand experiences of temporal passage as experiences of events undergoing absolute becoming. I first show that differences between substantialist and relationist accounts of time do not make a difference for how passage would be perceived. I then acknowledge that there might be more than one way to represent passage in visual experience. However, for AfE to work, there is one necessary condition that any experience must meet in order to be best explained by the fact that time passes: it must be such that it could not be accurate if time did not pass. For the rest of the chapter I argue that only perceptual experiences as of events undergoing absolute becoming would meet this condition. In particular, I argue against two kinds of experiences that are commonly thought of as experiences of temporal passage: experiences of ordinary change and experiences (as) of 'A-presentness', presentness as understood by the A-theory. From experiences of ordinary change one can only infer duration, but not passage. In the case of A-presentness, I argue that either we cannot visually represent A-presentness at all, or only in such a way that we cannot infer passage from it. Finally I argue that the only thing that would differentiate a dynamic from a static world is absolute becoming. Therefore, only an experience of absolute becoming is such that it could only be accurate in a dynamic world. I conclude that only perceptual experiences as of events undergoing absolute becoming meet the necessary condition to be best explained by the fact that time passes.

CHAPTER EIGHT pursues the question whether we could have perceptual experiences as of absolute becoming, or A-change, the change that constitutes temporal passage. I argue that for AfE to go through, we would need to experience A-change *as* A-change. I then argue that none of the standard theories of change perception can accommodate such experiences. Memory theories deny that we can have perceptual experiences of change in general. Given the retentional theory of temporal experience, we could not perceptually represent A-change as A-change — in other words, even if we did perceive A-change, the change would look the same as B-change. The extensional theory of change experience, on the other hand, is metaphysically incompatible with presentism, the theory of time that can accommodate temporal passage. The

reason is that on the extensional theory experiential acts are supposed to be temporally extended, whereas presentism only allows for things that are wholly present, where the present is standardly supposed to be instantaneous. One way to possibly reconcile the two theories is to deny that the (objective) present is instantaneous. This results in two non-standard forms of presentism: 'Compound Presentism' (Dainton 2001) and 'Simple Presentism'. At first glance, these theories appear to be compatible with the extensional theory of perception, but they cannot help the AFE theorist either. Compound Presentism is intrinsically incoherent. Among other problems, it falls prey to a version of McTaggart's argument. Given Simple Presentism we could not experience A-change because we could only experience what occurs during a simple present, where A-change would have to be a change from one simple present time to the other. It follows that there is no major account of temporal perception that allows for experiences of A-change in such a way that we could infer from these experiences that time passes. Finally I discuss two objections against my argument. The first objection accuses me of implicitly assuming that temporal passage properties are high-level properties and that we cannot experience high-level properties. I deny this and point out that my argument does not rely on these assumptions. The second objection is that temporal passage need not be visible in visual experience in order to be represented by that experience. It might be experientially represented in a 'phenomenally present as absent' sort of way. Two psychological mechanisms might explain this sort of representation. We might be 'hard-wired' to experientially represent temporal passage or the perceptual experience might be cognitively penetrated by the belief (concept) that time passes and thereby altered such that it represents passage. My reply is that firstly, we could not know whether we perceptually represent passage in a present-as-absent kind of way and that, secondly, the resulting experiences would in any case not be best explained by the fact that time passes. I conclude that we cannot infer that time passes from experience, because on none of the leading accounts of temporal perception we could perceptually experience A-change as A-change. Therefore the Argument from Experience fails.